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Report of the 103rd National Conference on Weights and Measures

Tulsa, Oklahoma – July 15 through 19, 2018

as adopted by the 103rd National Conference on Weights and Measures 2018

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U.S. Department of Commerce
Wilbur L. Ross, Jr., Secretary

National Institute of Standards and Technology
Dr. Walter Copan, NIST Director and Under Secretary of Commerce for Standards and Technology

The National Conference on Weights and Measures is supported by the National Institute of Standards and Technology and is attended by officials from various states, counties, and cities, as well as representatives from the U.S. Government, other nations, industry, and consumer organizations.

Abstract

The 103rd Annual Meeting of the National Conference on Weights and Measures (NCWM) was held July 15 - 19, 2018, at the Hyatt Regency Tulsa Hotel, Tulsa, Oklahoma. The theme of the meeting was "Valued Traditions & New Innovations- Confidence in Every Transaction."

Reports by the NCWM Board of Directors, Standing Committees, and Special Purpose Committees constitute the major portion of this publication, along with the addresses delivered by Conference officials and other authorities from government and industry.

Special meetings included those of the Meter Manufacturers Association, Packaging and Labeling Subcommittee, Fuels and Lubricants Subcommittee, Associate Membership Committee, Regional Association Meetings, and the Weigh-in-Motion Task Group.

Key words: laws and regulations; legal metrology; meters; scales; specifications and tolerances; training; type evaluation; uniform laws; weights and measures.

Note: The policy of the National Institute of Standards and Technology is to use units of International System of Units (SI) in all its publications. In this publication, however, recommendations received by the NCWM technical committees have been printed as they were submitted, and, therefore, may contain references to units of the metric system where such units are commonly used in industry practice. Opinions expressed in non-NIST papers are those of the authors and not necessarily those of the National Institute of Standards and Technology. Non-NIST speakers are solely responsible for the content and quality of their material.

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National Conference on Weights and Measures

Annual Report of the 103rd NCWM

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Past Chairmen of the Conference

Conference	Year	Location	Chairman
1st	1905	Washington, D.C.	Dr. S.W. Stratton, Bureau of Standards
2nd	1906	Washington, D.C.	Dr. S.W. Stratton, Bureau of Standards
3rd	1907	Washington, D.C.	Dr. S.W. Stratton, Bureau of Standards
4th	1908	Washington, D.C.	Dr. S.W. Stratton, Bureau of Standards
	1909	Conference Was Not Held	
5th	1910	Washington, D.C.	Dr. S.W. Stratton, Bureau of Standards
6th	1911	Washington, D.C.	Dr. S.W. Stratton, Bureau of Standards
7th	1912	Washington, D.C.	Dr. S.W. Stratton, Bureau of Standards
8th	1913	Washington, D.C.	Dr. S.W. Stratton, Bureau of Standards
9th	1914	Washington, D.C.	Dr. S.W. Stratton, Bureau of Standards
10th	1915	Washington, D.C.	Dr. S.W. Stratton, Bureau of Standards
11th	1916	Washington, D.C.	Dr. S.W. Stratton, Bureau of Standards
	1917	Conference Was Not Held	
	1918	Conference Was Not Held	
12th	1919	Washington, D.C.	Dr. S.W. Stratton, Bureau of Standards
13th	1920	Washington, D.C.	Dr. S.W. Stratton, Bureau of Standards
14th	1921	Washington, D.C.	Dr. S.W. Stratton, Bureau of Standards
15th	1922	Washington, D.C.	Dr. S.W. Stratton, Bureau of Standards
16th	1923	Washington, D.C.	Dr. George Burgess, Bureau of Standards
17th	1924	Washington, D.C.	Dr. George Burgess, Bureau of Standards
18th	1925	Washington, D.C.	Dr. George Burgess, Bureau of Standards
19th	1926	Washington, D.C.	Dr. George Burgess, Bureau of Standards
20th	1927	Washington, D.C.	Dr. George Burgess, Bureau of Standards
21st	1928	Washington, D.C.	Dr. George Burgess, Bureau of Standards
22nd	1929	Washington, D.C.	Dr. George Burgess, Bureau of Standards
23rd	1930	Washington, D.C.	Dr. George Burgess, Bureau of Standards
24th	1931	Washington, D.C.	Dr. George Burgess, Bureau of Standards
	1932	Conference Was Not Held	
	1933	Conference Was Not Held	
	1934	Conference Was Not Held	
25th	1935	Washington, D.C.	Dr. Lyman Briggs, National Bureau of Standards
26th	1936	Washington, D.C.	Dr. Lyman Briggs, National Bureau of Standards
27th	1937	Washington, D.C.	Dr. Lyman Briggs, National Bureau of Standards
28th	1938	Washington, D.C.	Dr. Lyman Briggs, National Bureau of Standards
29th	1939	Washington, D.C.	Dr. Lyman Briggs, National Bureau of Standards

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Conference	Year	Location	Chairman
30th	1940	Washington, D.C.	Dr. Lyman Briggs, National Bureau of Standards
31st	1941	Washington, D.C.	Dr. Lyman Briggs, National Bureau of Standards
	1942	Conference Was Not Held	
	1943	Conference Was Not Held	
	1944	Conference Was Not Held	
	1945	Conference Was Not Held	
32nd	1946	Washington, D.C.	Dr. E.U. Condon, National Bureau of Standards
33rd	1947	Washington, D.C.	Dr. E.U. Condon, National Bureau of Standards
	1948	Conference Was Not Held	
34th	1949	Washington, D.C.	Dr. E.U. Condon, National Bureau of Standards
35th	1950	Washington, D.C.	Dr. E.U. Condon, National Bureau of Standards
36th	1951	Washington, D.C.	Dr. E.U. Condon, National Bureau of Standards
37th	1952	Washington, D.C.	Dr. A.V. Astin, National Bureau of Standards
38th	1953	Washington, D.C.	Dr. A.V. Astin, National Bureau of Standards
39th	1954	Washington, D.C.	Dr. A.V. Astin, National Bureau of Standards
40th	1955	Washington, D.C.	Dr. A.V. Astin, National Bureau of Standards
41st	1956	Washington, D.C.	Dr. A.V. Astin, National Bureau of Standards
42nd	1957	Washington, D.C.	Dr. A.V. Astin, National Bureau of Standards
43rd	1958	Washington, D.C.	J.P. McBride, MA
44th	1959	Washington, D.C.	C.M. Fuller, CA
45th	1960	Washington, D.C.	H.E. Crawford, FL
46th	1961	Washington, D.C.	R.E. Meek, IN
47th	1962	Washington, D.C.	Robert Williams, NY
48th	1963	Washington, D.C.	C.H. Stender, SC
49th	1964	Washington, D.C.	D.M. Turnbull, WA
50th	1965	Washington, D.C	V.D. Campbell, OH
51st	1966	Denver, CO	J.F. True, KS
52nd	1967	Washington, D.C.	J.E. Bowen, MA
53rd	1968	Washington, D.C.	C.C. Morgan, IN
54th	1969	Washington, D.C.	S.H. Christie, NJ
55th	1970	Salt Lake City, UT	R.W. Searles, OH
56th	1971	Washington, D.C.	M. Jennings, TN
57th	1972	Washington, D.C.	E.H. Black, CA
58th	1973	Minneapolis, MN	George Johnson, KY
59th	1974	Washington, D.C.	John Lewis, WA
60th	1975	San Diego, CA	Sydney Andrews, FL
61st	1976	Washington, D.C.	Richard Thompson, MD
62nd	1977	Dallas, TX	Earl Prideaux, CO

Conference	Year	Location	Chairman
63rd	1978	Washington, D.C.	James Lyles, VA
64th	1979	Portland, OR	Kendrick Simila, OR
65th	1980	Washington, D.C.	Charles Vincent, TX
66th	1981	St. Louis, MO	Edward Stadolnik, MA
67th	1982	Atlanta, GA	Edward Heffron, MI
68th	1983	Sacramento, CA	Charles Greene, NM
69th	1984	Boston, MA	Sam Hindsman, AR
70th	1985	Washington, D.C.	Ezio Delfino, CA
71st	1986	Albuquerque, NM	George Mattimoe, HI
72nd	1987	Little Rock, AR	Frank Nagele, MI
73rd	1988	Grand Rapids, MI	Darrell Guensler, CA
74th	1989	Seattle, WA	John Bartfai, NY
75th	1990	Washington, D.C.	Fred Gerk, NM
76th	1991	Philadelphia, PA	N. David Smith, NC
77th	1992	Nashville, TN	Sidney Colbrook, IL
78th	1993	Kansas City, MO	Allan Nelson, CT
79th	1994	San Diego, CA	Thomas Geiler, MA
80th	1995	Portland, ME	James Truex, OH
81st	1996	New Orleans, LA	Charles Gardner, NY
82nd	1997	Chicago, IL	Barbara Bloch, CA
83rd	1998	Portland, OR	Steven Malone, NE
84th	1999	Burlington, VT	Aves Thompson, AK
85th	2000	Richmond, VA	Wes Diggs, VA
86th	2001	Washington, D.C.	Louis Straub, MD
87th	2002	Cincinnati, OH	Ronald Murdock, NC
88th	2003	Sparks, NV	Ross Andersen, NY
89th	2004	Pittsburgh, PA	Dennis Ehrhart, AZ
90th	2005	Orlando, FL	Wes Diggs, VA
91st	2006	Chicago, IL	Don Onwiler, NE
92nd	2007	Salt Lake City, UT	Michael Cleary, CA
93rd	2008	Burlington, VT	Judy Cardin, WI
94th	2009	San Antonio, TX	Jack Kane, MT
95th	2010	St. Paul, MN	Randy Jennings, TN
96th	2011	Missoula, MT	Tim Tyson, KS
97th	2012	Portland, ME	Kurt Floren, CA
98th	2013	Louisville, KY	Stephen Benjamin, NC
99th	2014	Detroit, MI	John Gaccione, NY
100th	2015	Philadelphia, PA	Ronald Hayes, MO

Conference	Year	Location	Chairman
101st	2016	Denver, CO	Jerry Buendel, WA
102nd	2017	Pittsburgh, PA	Kristin Macey, CA
103rd	2018	Tulsa, OK	James Cassidy, MA

2017 - 2018 Organizational Chart

National Conference on Weights and Measures (NCWM) Board of Directors			
OFFICE	**NAME**	**AFFILIATION**	**TERM ENDS**
Chairman	James Cassidy	Massachusetts	2018
Chairman-Elect	Brett Gurney	Utah	2018
Immediate Past Chair	Kristin Macey	California	2018
Treasurer	Raymond Johnson	New Mexico	2020
Active Membership – Western	Mahesh Albuquerque	Colorado	2022
Active Membership – Southern	Kenneth Ramsburg	Maryland	2018
Active Membership – Northeastern	Steve Giguere	Maine	2019
Active Membership – Central	Craig VanBuren	Michigan	2020
At-Large	Chuck Corr	Archer Daniels Midland Company	2018
At-Large	Julie Quinn	Minnesota	2021
Associate Membership Representative	Christopher Guay	Procter and Gamble, Co.	2019
Honorary NCWM President	Walter G. Copan	NIST Director	NA
Executive Director	Don Onwiler	NCWM	NA
Executive Secretary	Dr. Douglas Olson	NIST, Office of Weights and Measures	NA
NTEP Administrator	Jim Truex	NCWM	NA
Measurement Canada Advisor	Carl Cotton	Measurement Canada	NA

National Type Evaluation Program Committee (NTEP)			
OFFICE	**NAME**	**AFFILIATION**	**TERM ENDS**
Committee Chair	Kristin Macey	California	2018
Upcoming Committee Chair	James Cassidy	City of Cambridge, Massachusetts	2019
Upcoming Committee Chair	Brett Gurney	Utah	2020
SWMA Representative	Kenneth Ramsburg	Maryland	2018
CWMA Representative	Craig VanBuren	Michigan	2020
NTEP Administrator	Jim Truex	NCWM	NA

Finance Committee

OFFICE	NAME	AFFILIATION	TERM ENDS
Committee Chair	Brett Gurney	Utah	2018
Nominated Chair-Elect	TBD		2018
Treasurer	Raymond Johnson	New Mexico	2018
Associate Membership Representative	Christopher Guay	Procter and Gamble, Co.	2018
Executive Director	Don Onwiler	NCWM	NA

Laws and Regulations Committee (L&R)

OFFICE	NAME	AFFILIATION	TERM ENDS
Committee Chair	Ethan Bogren	Westchester County, New York	2020
Member	John Albert	Missouri	2018
Member	Michelle Wilson	Arizona	2019
Member	Hal Prince	Florida	2021
Member	John McGuire	New Jersey	2022
Associate Membership Representative	Rebecca Richardson	MARC – IV Consulting	2018
Canadian Technical Advisor	Lance Robertson	Measurement Canada	NA
NIST Technical Advisor	David Sefcik	NIST, Office of Weights and Measures	NA
NIST Technical Advisor	Lisa Warfield	NIST, Office of Weights and Measures	NA

Professional Development Committee (PDC)

OFFICE	NAME	AFFILIATION	TERM ENDS
Committee Chair	Lori Jacobson	South Dakota	2018
Member	Gene Robertson	Mississippi	2019
Member	Marc Paquette	Vermont	2020
Member	Marco Mares	San Diego County, California	2021
Member	Jean Kliethermes	Missouri	2022
Associate Membership Representative	Richard Shipman	Rice Lake Weighing Systems, Inc.	2018
Safety Liaison	Julie Quinn	Minnesota	NA

Professional Development Committee (PDC)			
OFFICE	**NAME**	**AFFILIATION**	**TERM ENDS**
NIST Liaison	Tina Butcher	NIST, Office of Weights and Measures	NA
Certification Coordinator	Ross Andersen	Retired	NA

Specifications and Tolerances Committee (S&T)			
OFFICE	**NAME**	**AFFILIATION**	**TERM ENDS**
Committee Chair	Ivan Hankins	Iowa	2019
Member	Joseph Eccleston	Maryland	2018
Member	Rachelle Miller	Wisconsin	2020
Member	Josh Nelson	Oregon	2021
Member	Brad Bachelder	Maine	2022
Canadian Technical Advisor	Luciano Burtini	Measurement Canada	NA
NIST Technical Advisor	TBD	NIST, Office of Weights and Measures	NA
NIST Technical Advisor	Rick Harshman	NIST, Office of Weights and Measures	NA
NTEP Technical Advisor	Darrell Flocken	NCWM	NA

Specifications and Tolerances Committee (S&T)			
OFFICE	**NAME**	**AFFILIATION**	**TERM ENDS**
Committee Chair	Kristin Macey	California	2018
Member	Stephen Benjamin	North Carolina	2018
Member	Mark Coyne	City of Brockton, Massachusetts	2018
Member	Frank Greene	Connecticut	2018
Member	Ivan Hankins	Iowa	2018
Member	Richard Lewis	Georgia	2018
Member	Hal Prince	Florida	2018

Credentials Committee			
OFFICE	**NAME**	**AFFILIATION**	**TERM ENDS**
Committee Chair	Lori Jacobson	South Dakota	2018
Member	Elaine Vieira	Massachusetts	2019
Member	David Aguayo	County of San Luis Obispo, California	2020
Coordinator	Darrell Flocken	NCWM	NA

Appointive Officials			
OFFICE	**NAME**	**AFFILIATION**	**TERM ENDS**
Chaplain	Constantine Cotsoradis	Flint Hills Resources	2018
Parliamentarian	Louis Straub	Fairbanks Scale, Inc.	2018
Presiding Officer	Tim Chesser	Arkansas	2018
Presiding Officer	Loren Minnich	Kansas	2018
Presiding Officer	TBD		2018
Sergeant-at-Arms	Jack Walsh	Town of Wellesley, Massachusetts	2018
Sergeant-at-Arms	TBD		2018
Sergeant-at-Arms	TBD		2018

Associate Membership Committee			
OFFICE	**NAME**	**AFFILIATION**	**TERM ENDS**
Committee Chair	Bill Callaway	Crompco	2018
Vice-Chair	Mark Flint	ADM	2018
Secretary/Treasurer	Bob Wiese	Northwest Tank and Environmental Services	2018
Member	David Calix	NCR Corporation	2018
Member	Bill Callaway	Crompco	2018
Member	Robert Murnane, Jr.	Seraphin Test Measure	2018
Member	Richard Shipman	Rice Lake Weighing Systems, Inc.	2020
Member	Christopher Guay	Procter and Gamble, Co.	2020
Member	Mark Flint	ADM	2020

Associate Membership Committee			
OFFICE	**NAME**	**AFFILIATION**	**TERM ENDS**
Member	Rebecca Richardson	MARC – IV Consulting	2020
Member	Prentiss Searles	American Petroleum Institute	2022
Member	Bob Wiese	Northwest Tank and Environmental Services	2022

Fuels and Lubricants Subcommittee		
OFFICE	**NAME**	**AFFILIATION**
Committee Chair	Bill Striejewske	Nevada
Vice-Chair	Ronald Hayes	Missouri
Vice-Chair	Randy Jennings	Tennessee
Secretary	Kevin Ferrick	American Petroleum Institute
Vice-Secretary	Rebecca Richardson	MARC – IV Consulting
NIST Technical Advisor	David Sefcik	NIST, Office of Weights and Measures
NIST Technical Advisor	Lisa Warfield	NIST, Office of Weights and Measures
Advisory Member	Curtis Williams	Retired
Public Sector Member	Mahesh Albuquerque	Colorado
Public Sector Member	Stephen Benjamin	North Carolina
Public Sector Member	Tim Elliott	Washington
Public Sector Member	Mike Harrington	Iowa
Public Sector Member	Lori Jacobson	South Dakota
Public Sector Member	Kristin Macey	California
Public Sector Member	Doug Rathbun	Illinois
Public Sector Member	Brenda Sharkey	South Dakota
Public Sector Member	Charles Stutesman	Kansas
Public Sector Member	Timothy White	Michigan
Public Sector Member	Michelle Wilson	Arizona
Private Sector Member	Holly Alfano	Independent Lubricant Manufacturers Association
Private Sector Member	Matt Bjornson	Bjornson Oil Company
Private Sector Member	Bill Cannella	Chevron Global Downstream, LLC
Private Sector Member	Chuck Corr	Archer Daniels Midland Company

Fuels and Lubricants Subcommittee		
OFFICE	**NAME**	**AFFILIATION**
Private Sector Member	Davis Cosey	Davis Oil Company
Private Sector Member	Kelly Davis	Renewable Fuels Association
Private Sector Member	Ed Dougherty	Sunoco LP
Private Sector Member	Scott Fenwick	National Biodiesel Board
Private Sector Member	David Fialkov	NATSO
Private Sector Member	Rick Fragnito	Shell
Private Sector Member	Philip Guillemette	Flint Hills Resources, LP
Private Sector Member	John Harkins	Sunoco Logistics
Private Sector Member	Marilyn Herman	Herman and Associates
Private Sector Member	Cal Hodge	A 2nd Opinion, Inc.
Private Sector Member	Joanna Johnson	Automotive Oil Exchange Association
Private Sector Member	Brian Kernke	Loves Travel Stops
Private Sector Member	Stephen Kirby	General Motors
Private Sector Member	David A. Kovach	BP Products
Private Sector Member	Mike Kunselman	Center for Quality Assurance
Private Sector Member	Jeffrey Leiter	Bassman, Mitchell, Alfano & Leiter Chtd.
Private Sector Member	Russ Lewis	Marathon Petroleum, LLC
Private Sector Member	Michael Lynch	ExxonMobil Corporation
Private Sector Member	Scott Mason	Phillips 66
Private Sector Member	John Maynes	PMCI
Private Sector Member	Beverly Michels	BP Products
Private Sector Member	Kristi Moore	KMoore Consulting, LLC
Private Sector Member	Manuch Nikanjam	Chevron Global Downstream, LLC
Private Sector Member	Brian Parnell	Mapco Express
Private Sector Member	Keith Penn	Colonial Pipeline Company
Private Sector Member	Derek Regal	Tesoro Companies, Inc.
Private Sector Member	Prentiss Searles	American Petroleum Institute
Private Sector Member	Jenny Sigelko	Volkswagen Group of America
Private Sector Member	Dr. Prasad Tumati	Haltermann Solutions
Private Sector Member	Rob Underwood	Petroleum Marketers Association of America

Fuels and Lubricants Subcommittee		
OFFICE	**NAME**	**AFFILIATION**
Private Sector Member	Marie Valentine	Toyota – TEMA – ITC
Private Sector Member	Steve Vander Griend	ICM, Inc.

Packaging and Labeling Subcommittee		
OFFICE	**NAME**	**AFFILIATION**
Committee Chair	Christopher Guay	Procter and Gamble, Co.
NIST Technical Advisor	David Sefcik	NIST, Office of Weights and Measures
Public Sector – Central	Nicholas Owens	Stark County Weights and Measures, Ohio
Public Sector – Northeastern	Frank Greene	Connecticut
Public Sector – Southern	Hal Prince	Florida
Public Sector – Western	Angela Godwin	County of Ventura, California
Private Sector Member	Ann Boeckman	Kraft Heinz Company
Private Sector Member	Krister Hard af Segerstad	IKEA North America Services, LLC
Private Sector Member	Zina Juroch	Pier 1 Imports

Promotional Tool Kit Task Group		
OFFICE	**NAME**	**AFFILIATION**
Chair	Stephen Benjamin	North Carolina
Public Sector Member	Jerry Buendel	Washington
Public Sector Member	Kurt Floren	Los Angeles County, California
Private Sector Member	Bill Callaway	Crompco
Private Sector Member	John Hughes	Rice Lake Weighing Systems, Inc.

Safety Task Group		
OFFICE	**NAME**	**AFFILIATION**
Chair	Julie Quinn	Minnesota
Public Sector Member	Jason Flint	New Jersey
Public Sector Member	Georgia Harris	NIST, Office of Weights and Measures

Safety Task Group		
Public Sector Member	Elizabeth Koncki	Maryland
Public Sector Member	Matt Maiten	Santa Barbara County, California
Public Sector Member	Brenda Sharkey	South Dakota
Public Sector Member	Mike Sikula	New York
Private Sector Member	Tisha Arriaga	Marathon Petroleum, LLC
Private Sector Member	Bill Callaway	Crompco
Private Sector Member	Remy Cano	Northwest Tank and Environmental Services, Inc.
Private Sector Member	Brad Fryburger	Rinstrum, Inc.
Private Sector Member	Robert LaGasse	Mulch and Soil Council
Private Sector Member	John Lawn	Rinstrum, Inc.
Private Sector Member	Richard Shipman	Rice Lake Weighing Systems, Inc.

Weigh-In-Motion Task Group		
Office	**Name**	**Affiliation**
Co-Chair	Tim Chesser	Arkansas
Co-Chair	Alan Walker	Florida
NTEP Technical Advisor	Darrell Flocken	NCWM
NIST Technical Advisor	Rick Harshman	NIST, Office of Weights and Measures
Public Sector Member	John Barton	NIST, Office of Weights and Measures
Public Sector Member	Jason Flint	New Jersey
Public Sector Member	Greg Gholston	Mississippi
Public Sector Member	Lenny Goebel	Illinois
Public Sector Member	John McGuire	New Jersey
Public Sector Member	Jason Smith	South Dakota
Private Sector Member	Jon Arnold	Intercomp Company
Private Sector Member	Tim Broemmer	Rice Lake Weighing Systems, Inc.
Private Sector Member	Scott Davidson	Mettler-Toledo, LLC
Private Sector Member	James Faas	YRC Freight
Private Sector Member	Brad Fryburger	Rinstrum, Inc.
Private Sector Member	Eric Golden	Cardinal Scale Manufacturing, Co.
Private Sector Member	Joe Grell	Rice Lake Weighing Systems, Inc.

Weigh-In-Motion Task Group		
Office	**Name**	**Affiliation**
Private Sector Member	Randy Hanson	International Road Dynamics
Private Sector Member	John Lawn	Rinstrum, Inc.
Private Sector Member	Joe Rickey	Rinstrum, Inc.
Private Sector Member	Louis Straub	Fairbanks Scale, Inc.
Private Sector Member	Richard Suiter	Richard Suiter Consulting
Private Sector Member	Brian Taylor	Intelligent Imaging Systems
Private Sector Member	Russ Vires	Mettler-Toledo, LLC
Private Sector Member	Sam Wimsett	Cardinal Scale Manufacturing, Co.
Private Sector Member	Matt Young	Intercomp Company

Multiple Dimension Measuring Device Work Group		
OFFICE	**NAME**	**AFFILIATION**
Chair	Robert Kennington	Quantronix, Inc.
NTEP Administrator	Jim Truex	NCWM
NTEP Specialist	Darrell Flocken	NCWM
Technical Advisor	Rick Harshman	NIST, Office of Weights and Measures
Public Sector Member	Tom Buck	Ohio
Public Sector Member	Fran Elson-Houston	Ohio
Public Sector Member	Pascal Turgeon	Measurement Canada, Policy/Regulations Group
Private Sector Member	Sprague Ackley	Honeywell
Private Sector Member	Bill Danderand	FedEx Freight
Private Sector Member	Scott Davidson	Mettler-Toledo, LLC
Private Sector Member	Michael Eichenberg	FreightSnap, LLC
Private Sector Member	Matthew Erim	National Motor Freight Traffic Association
Private Sector Member	Scott Henry	Zebra Technologies
Private Sector Member	Uwe Mohr	Vitronic
Private Sector Member	Scott Murchison	Zebra Technologies
Private Sector Member	Don Newell	National Motor Freight Traffic Association
Private Sector Member	Sameer Parmar	SICK, Inc.

Multiple Dimension Measuring Device Work Group		
OFFICE	**NAME**	**AFFILIATION**
Private Sector Member	Weston Privett	XPO LTL
Private Sector Member	Tony Romeo	Datalogic
Private Sector Member	Christopher Senneff	Rice Lake Weighing Systems, Inc.
Private Sector Member	Richard Shipman	Rice Lake Weighing Systems, Inc.
Private Sector Member	Mike Stutler	United Parcel Service
Private Sector Member	Richard Suiter	Richard Suiter Consulting
Private Sector Member	Russ Vires	Mettler-Toledo, LLC
Private Sector Member	Scott Wigginton	United Parcel Service

NTEP EVSE Work Group		
OFFICE	**NAME**	**AFFILIATION**
Chair	Andrei Moldoveanu	NEMA
NTEP Administrator	Jim Truex	NCWM
Technical Advisor	Juana Williams	NIST, Office of Weights and Measures
Public Sector Member	Andrei Brezoica	California
Public Sector Member	Tom Buck	Ohio
Public Sector Member	Joseph Eccleston	Maryland
Public Sector Member	Allen Katalinic	North Carolina
Public Sector Member	Tom Mendleski	California
Private Sector Member	Ted Bohn	ANL
Private Sector Member	Harry Haas	Siemens Industry, Inc.
Private Sector Member	Bill Hardy	Power Measurements, LLC
Private Sector Member	Dave Parmelee	Control Module, Inc.

NTEP Belt-Conveyor Sector		
OFFICE	**NAME**	**AFFILIATION**
Chair	Peter Sirrico	Thayer Scale/Hyer Industries
NTEP Administrator	Jim Truex	NCWM
NTEP Specialist	Darrell Flocken	NCWM

NTEP Belt-Conveyor Sector		
OFFICE	**NAME**	**AFFILIATION**
Technical Advisor	John Barton	NIST, Office of Weights and Measures
Public Sector Member	Tina Butcher	NIST, Office of Weights and Measures
Public Sector Member	Zacharias Tripoulas	Maryland
Private Sector Member	Jason Kukachka	Thermo Fisher Scientific

NTEP Grain Analyzer Sector		
OFFICE	**NAME**	**AFFILIATION**
Chair	Karl Cunningham	Illinois
NTEP Administrator	Jim Truex	NCWM
NTEP Specialist	Darrell Flocken	NCWM
Technical Advisor	G. Diane Lee	NIST, Office of Weights and Measures
Advisory Member	Cassie Eigenmann	Retired
Public Sector Member	Randy Burns	Arkansas
Public Sector Member	Tina Butcher	NIST, Office of Weights and Measures
Public Sector Member	Ivan Hankins	Iowa
Public Sector Member	Thomas Hughes	Missouri
Public Sector Member	Jason Jordan	USDA, GIPSA, Technical Services Division
Private Sector Member	Jeffrey Adkisson	Grain and Feed Association of Illinois
Private Sector Member	Rachel Beiswenger	TSI Incorporated
Private Sector Member	Martin Clements	The Steinlite Corporation
Private Sector Member	Kathy Conover	DICKEY-john Corporation
Private Sector Member	Andrew Gell	Foss North America
Private Sector Member	Charles Hurburgh, Jr.	Iowa State University
Private Sector Member	Jess McCluer	National Grain and Feed Association
Private Sector Member	Thomas Runyon	Seedburo Equipment Co.

NTEP Measuring Sector		
OFFICE	**NAME**	**AFFILIATION**
Chair	Michael Keilty	Endress + Hauser Flowtec AG, USA
NTEP Administrator	Jim Truex	NCWM
NTEP Specialist	Darrell Flocken	NCWM
Technical Advisor	Tina Butcher	NIST, Office of Weights and Measures
Public Sector Member	Luciano Burtini	Measurement Canada
Public Sector Member	Tina Butcher	NIST, Office of Weights and Measures
Public Sector Member	Joe Eccleston	Maryland
Public Sector Member	Allen Katalinic	North Carolina
Public Sector Member	John Roach	California
Private Sector Member	Steve Bar	Bennett Pump Company
Private Sector Member	Marc Buttler	Emerson Process Management/Micro Motion
Private Sector Member	Craig Cavanaugh	Tuthill Transfer Systems
Private Sector Member	Rodney Cooper	Brodie International
Private Sector Member	Constantine Cotsoradis	Flint Hills Resources
Private Sector Member	Ronnell Gallon	Zenner Performance Meters, Inc.
Private Sector Member	Gordon Johnson	Gilbarco, Inc.
Private Sector Member	Dmitri Karimov	Liquid Controls, LLC
Private Sector Member	Douglas Long	RDM Industrial Electronics
Private Sector Member	Wade Mattar	Invensys/Foxboro
Private Sector Member	Richard Miller	FMC Technologies Measurement Solutions, Inc.
Private Sector Member	Randy Moses	Wayne Fueling Systems
Private Sector Member	Andre Noel	Neptune Technology Group, Inc.
Private Sector Member	Christopher (Adam) Oldham	Gilbarco, Inc.
Private Sector Member	Robin Parsons	Parafour Innovations, LLC
Private Sector Member	Richard Tucker	RL Tucker Consulting, LLC

NTEP Software Sector		
OFFICE	**NAME**	**AFFILIATION**
Chair	James Pettinato	FMC Technologies Measurement Solutions, Inc.
NTEP Administrator	Jim Truex	NCWM
NTEP Specialist	Darrell Flocken	NCWM
Secretary	Teri Gulke	Liquid Controls, LLC
Technical Advisor	Doug Bliss	Mettler-Toledo, LLC
Public Sector Member	Andrei Brezoica	California
Public Sector Member	Tom Buck	Ohio
Public Sector Member	Luciano Burtini	Measurement Canada
Public Sector Member	Joe Eccleston	Maryland
Public Sector Member	Eric Morabito	New York
Public Sector Member	John Roach	California
Public Sector Member	Ambler Thompson	NIST, Office of Weights and Measures
Public Sector Member	Zacharias Tripoulas	Maryland
Private Sector Member	Mary Abens	Emerson Process Management
Private Sector Member	John Atwood	Tyson Foods
Private Sector Member	Gary Benjamin	NCR Corporation
Private Sector Member	Benjamin Bertz	Red Seal Measurement
Private Sector Member	Kevin Detert	Avery Weigh-Tronix
Private Sector Member	Andrew Gell	Foss North America
Private Sector Member	Keith Harper	Gencor Industries, Inc.
Private Sector Member	Tony Herrin	Cardinal Scale Manufacturing, Co.
Private Sector Member	Jan Konijnenburg	Rice Lake Weighing Systems, Inc.
Private Sector Member	Dominic Meyer	KSi Conveyors, Inc.
Private Sector Member	Richard Miller	FMC Technologies Measurement Solutions, Inc.
Private Sector Member	Christopher (Adam) Oldham	Gilbarco, Inc.
Private Sector Member	Mike Roach	VeriFone
Private Sector Member	Robin Sax	CompuWeigh Corporation
Private Sector Member	David Vande Berg	Vande Berg Scales
Private Sector Member	John Wind	Bizerba USA, Inc.
Private Sector Member	Kraig Wooddell	Hobart

NTEP Weighing Sector		
OFFICE	**NAME**	**AFFILIATION**
Chair	Rob Upright	Vishay Transducers
NTEP Administrator	Jim Truex	NCWM
NTEP Specialist	Darrell Flocken	NCWM
Technical Advisor	Rick Harshman	NIST, Office of Weights and Measures
Advisory Member	Robert Feezor	Retired
Public Sector Member	L. Cary Ainsworth	USDA, GIPSA
Public Sector Member	Tina Butcher	NIST, Office of Weights and Measures
Public Sector Member	Kevin Chesnutwood	NIST, Office of Weights and Measures
Public Sector Member	Fran Elson-Houston	Ohio
Public Sector Member	Nathan Gardner	Oregon
Public Sector Member	Marcus Harwitz	USDA, GIPSA, FGIS
Public Sector Member	Robert Meadows	Kansas
Public Sector Member	Eric Morabito	New York
Public Sector Member	Zacharias Tripoulas	Maryland
Public Sector Member	Pascal Turgeon	Measurement Canada
Public Sector Member	Juana Williams	NIST, Office of Weights and Measures
Private Sector Member	Steven Beitzel	Systems Associates, Inc.
Private Sector Member	Neil Copley	Thurman Scale Co.
Private Sector Member	Bill Danderand	FedEx Freight
Private Sector Member	Mitchell Eyles	Flintec, Inc.
Private Sector Member	Brad Fryburger	Rinstrum, Inc.
Private Sector Member	Eric Golden	Cardinal Scale Manufacturing, Co.
Private Sector Member	Jon Heinlein	Transcell Technology, Inc.
Private Sector Member	Scott Henry	Zebra Technologies
Private Sector Member	Sam Jalahej	Totalcomp, Inc.
Private Sector Member	Jan Konijnenburg	Rice Lake Weighing Systems, Inc.
Private Sector Member	John Lawn	Rinstrum, Inc.
Private Sector Member	L. Edward Luthy	Schenck Process Transport N.A.
Private Sector Member	Weston Privett	XPO LTL

NTEP Weighing Sector		
OFFICE	**NAME**	**AFFILIATION**
Private Sector Member	Thomas Rice	Mettler-Toledo, LLC
Private Sector Member	Kyle Schaffer	Tufner Weighing Systems
Private Sector Member	Louis Straub	Fairbanks Scale, Inc.
Private Sector Member	Russ Vires	Mettler-Toledo, LLC
Private Sector Member	Jerry Wang	A&D Engineering, Inc.

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Central Weights and Measures Association (CWMA) **www.cwma.net**		
States	Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin	
Contact	Ms. Sherry Turvey Kansas Department of Agriculture	(785) 564-6681 sherry.turvey@kda.ks.gov
Annual Meeting	May 21 - 24, 2018	Springfield, Illinois
Interim Meeting	October 16 - 18, 2017	St. Charles, Missouri

Northeastern Weights and Measures Association (NEWMA) **www.newma.org**		
States	Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Puerto Rico, Rhode Island, Vermont	
Contact	Mr. James Cassidy City of Cambridge Weights and Measures Department	(617) 349-6133 jcassidy@cambridgema.gov
Annual Meeting	May 7 - 10, 2018	Saratoga Springs, New York
Interim Meeting	October 24 - 26, 2017	Portsmouth, New Hampshire

Southern Weights and Measures Association (SWMA) **www.swma.org**		
States	Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, U.S. Virgin Islands, Virginia, West Virginia	
Contact	Mr. Tim Chesser Arkansas Bureau of Standards	(501) 570-1154 tim.chesser@aspb.ar.gov
Annual Meeting	October 8 - 11, 2017	North Little Rock, Arkansas

Western Weights and Measures Association (WWMA) **www.westernwma.org**		
States	Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming	
Contact	Ms. Michelle Wilson Arizona Department of Weights and Measures	(602) 771-4933 mwilson@azda.gov
Annual Meeting	September 24 - 28, 2017	Scottsdale, Arizona

General Session
Proceeding Speeches, Presentations, and Awards

Tulsa, Oklahoma
July 15 – 19, 2018

Table A
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Honorary President's Address

National Institute of Standards and Technology (NIST)

Tulsa, Oklahoma
July 15-19, 2018

Dr. Walter G. Copan
Under Secretary of Commerce for Standards and Technology and Director

Thank you, Doug for the introduction and to all of you for the warm welcome. Loren, thank you for your leadership in NCWM.

I'd like to recognize Jim and Don, and Kenny here in Oklahoma, and everyone who made this meeting possible. It's great to be back in Tulsa! This is my first NCWM meeting as director of NIST, and I am very pleased to join with our American community of metrology here.

The city of Tulsa has deep roots in the oil business. Actually, my first job right out of college was as a chemist dealing with fuels and lubricants, petroleum and specialty chemicals.

From the beginning of my career in physical and analytical chemistry, I came to appreciate the work that all of you do! I learned early on about the importance of accurate in-line metering of fuel additives to make sure that each gallon of fuel was treated with exactly the right amount of performance additives to meet and exceed top tier detergency standards. As a young chemist, I was recognized with a corporate innovation award for developing a new analytical technique to rapidly and precisely analyze fuels for detergent levels. It was a proud moment.

I also used to visit Bartlesville, from time to time – and just north of Bartlesville is the town of Copan, Oklahoma – it's right by the shores of Copan Lake. No wonder I feel right home here! Despite the name, as far as I know, there's no family relationship.

Tulsa really took off during the oil boom of the late 19th and early 20th century. And for most of the 20th century, it was considered the oil capital of America. Oil still plays a significant role in the economy of Tulsa. The city has diversified, too - and is now home to new industries, including aviation, telecommunications, technology and manufacturing.

I came to NIST after a diverse career in large and small companies, government service and non-profit leadership. I've admired NIST, then known as NBS – the National Bureau of Standards – since the beginning of my career, and it's an exciting place to be.

I learn something new every hour of every day, and I'm very grateful to the leadership and people of NIST for adopting me as one of their own. It's an enormous responsibility to lead one of the nation's most respected federal labs and a world leading science and technology institute. It is an honor, and humbling, to have the opportunity to serve my country in this way.

The founders of our nation realized how essential it was to have a trusted system of weights and measurements. This would ensure that our country could flourish, and that commerce would be fair. George Washington, in his first State of the Union Address on January 9, 1790, said "Uniformity in the currency, weights, and measures of the United States is an object of great importance, and will, I am persuaded, be duly attended to."

He could never have imagined how far we've come in realizing his prediction. And I'm delighted to have come to NIST at such a particularly exciting time. This is the beginning of a new age for measurements science.

For nearly a century, the meter was defined as the distance between two lines inscribed on a platinum-iridium bar.

Since it was first made, the meter has undergone two redefinitions. The first occurred in 1960, when it was defined as a precise number of wavelengths of light emitted from a krypton lamp. But this was only a temporary definition, because greater precision would become available.

In 1983, the meter was defined as the distance light travels in a vacuum in a little less than one three hundred millionth of a second. Light in a vacuum always travels at the same speed, and nothing can travel faster. That speed limit is woven into the very fabric of the universe.

Together with the atomic clock, which uses the vibration of atoms as a natural and unwavering pendulum, the meter is now fixed forever in these fundamental terms. It can be realized anywhere. We no longer need to rely on material objects to define it. This elegant and timeless definition is among the greatest achievements of the 20th century.

As many of you know, we are now on the brink of another momentous change. For the past 30 or so years, scientists at NIST and around the world have been working to redefine how the kilogram, the world's mass standard, can be expressed in terms of fundamental constants of nature.

Much like the meter before it, the kilogram, is defined as the mass of a small cylinder of platinum and iridium called the International Prototype Kilogram. It is kept at the BIPM (International Bureau of Weights and Measures) just outside of Paris, France. Forged in the 1880s, the kilogram artifact was specifically designed to resist change, but uncertainty has crept into the system.

The mass of the prototype cannot change - by definition. But the masses of the *copies* of the one official kilogram that are used to define mass throughout the world have been changing relative to it. Some have slightly gained mass, and some have slightly lost mass. It's as if your five-gallon prover had an invisible hole in it. The differences in mass are a bit of a mystery – and these are the kinds of things that keep metrologists up at night. We don't know exactly why these changes have occurred.

And we'll leave discovering the exact reasons to our scientists. Those of us in the practical business of measurement science are looking ahead to the permanent solution. It's been an intensive journey getting to this point, and this underscores the importance of basing our measurement units on constants that are truly timeless and unchanging.

This is as critical to science as it is to commerce. This November, we plan to see the kilogram undergo such a redefinition.

Using updated versions of a sophisticated instrument first created in the United Kingdom called the Kibble Balance, scientists at NIST and around the world have realized the kilogram—with unparalleled accuracy—in terms of electrical force.

Essentially, what we and our collaborators have done is build an electromagnet and measured the amount of electricity necessary to just lift a kilogram artifact off the ground and no more. We can use that exact quantity to make and verify new kilograms, thus freeing the world's mass standard from its platinum-iridium shackles.

Now, every country will be able to build electromagnetic Kibble balances and realize the mass unit for themselves. There will no longer be a need for metrologists to hand-carry these chunks of metal to France to compare them against the original.

Now, some may be disappointed that they might no longer get to travel to Paris, the City of Lights, for work every few years, but I think the fact that they will be able to sleep a little more peacefully should count for something. I can also assure you that this redefinition will be seamless and will have no effect on your work. The kilogram is still the kilogram. It's just defined in a different and fundamentally accurate way, so you, too, can rest easy.

And the kilogram is not the only international measurement unit getting a makeover. The unit of electric current, the ampere, has long been an embarrassment of sorts to the metrological community.

Its definition is physically impossible to realize as defined, which calls for measuring the magnetic force between two infinitely long wires held one meter apart.

In fact, we have had to define the ampere by appealing to two of its derived units—the volt and the ohm.

We finally have the chance, and the laboratory skills and know-how, to realize the ampere as the flow of a specific number of electrons past a point in one second, a great step forward. Also coming along for the redefinition ride are the kelvin, the unit of temperature; the mole, the unit for amount of substance; and the candela, the unit of brightness.

Change may seem hard, especially when you're talking about units that are supposed to be timeless and universal. But

sometimes change is warranted, and other times it is unavoidable. It is always better to start preparing and planning as early as possible. We must not wait until we have no choice.

Every civilization has recognized how vital accurate weights and measures are to ensuring fair trade and orderly marketplaces. NIST and the NCWM share a commitment to this work, and I am here to reaffirm our unwavering support for this organization and for your mission.

Weights and measures inspectors have always been on the front-line guarding against fraud and abuse and helping to ensure fair competition. Weights and measures inspectors, by their very nature, are "sticklers" for the details. Those of you who are inspectors approach your jobs in the same way all compliance officers do: You trust, but you verify. While our mission stays the same, what and how we measure changes as new technologies and products emerge. Increasingly, we are using digital scales rather than analog.

Weighing and measuring systems are often interfaced with computer systems and software programs to provide enhanced functions and new features for businesses and consumers. Increasingly, proprietary software is being used in legal metrology. As our measurement infrastructure has become more complex, our ability to ensure transparency and accuracy in the measurement transaction has become more challenging.

However, regulators and manufacturers alike have had to rise to that challenge. Inspectors must not only be proficient provers, but many are now being called upon to investigate high-tech crimes. And manufacturers have frequently stepped in to lend their expertise to solving these problems. This body has in the past few years made great strides in keeping up with emerging technologies and markets.

Certifying GPS-based measurement systems for calculating fares for transportation services, for instance, was a great move forward in regulating the new ride-hailing industry. And it also laid the groundwork for addressing other applications where weighing and measuring systems make use of "apps" to make measurements or process metrologically significant information.

We also face the challenge of verifying the accuracy of "apps", especially when software is updated frequently. What if the software can be changed in ways that could give regulators one figure and charge customers another? How must our inspection procedures change to adequately address these systems?

I'm reminded of a similar app-centered issued, when a diesel engine control program, a "defeat device," changed parameters when it was in the emissions test mode versus normal operations. Now, that work involved the EPA and the California Air Resources Board – but the principles apply broadly in markets where products are controlled by software.

How do we protect these consumers and businesses and make sure that the measurements are correct, and that prices charged are proper? We are in the era of all-electric and plug-in hybrid vehicles -- and there may well come a time when fossil-fuel powered vehicles will disappear entirely.

Will we be ready for that change? Our answer is "Yes!" Whatever the economy needs to assure fairness and accuracy in commerce, we will be there. We have already developed standards for addressing commercial systems used for electric vehicle fueling.

We must continually assess what changes are needed to our procedures and standards, to the infrastructure, to establish testing laboratories, and to provide necessary training and procedures to maintain traceability of those measurements.

There's also the matter of e-Commerce. Twenty-four years after the founding of Amazon, the Supreme Court has just ruled that states can collect sales tax on items sold over the internet. Slowly, but surely, the government is getting a handle on the virtual marketplace, and we must keep up. Online retailers are selling everything over the internet. We can get just about whatever we want via overnight or even same-day delivery.

And I'm sure that all of you have heard that some retailers are looking to employ fleets of drones to deliver orders to your door, in less time than it would have taken to go to the store yourself. It's exciting, and it brings new challenges together with the opportunity. A category of products with which we are all intimately familiar, groceries, are also increasingly being sold online, both by traditional grocery stores and other retailers that are new to the grocery business.

There is tremendous innovation in progress that promises to save us time and grant greater independence to people with mobility and other issues who have difficulties getting to the store. Of course, we will continue to use measurement standards and perform other tests to ensure that the scales are fair at the stores and distribution centers. But what happens when we leave? How will we assure integrity of measurements and reporting?

And what are the logistics of checking stores that are virtual, and use remote-fulfillment warehouses? Or where the goods are coming directly from wholesalers or a variety of different retailers? The approaches for products and delivery systems will need to adapt to this new paradigm.

These are all questions for future meetings of the NCWM. While I believe that the past has set our foundation, it need not dictate our future. The established methods are sound and let us be thoughtful about how we apply them going forward. We need to be strategic about how and when to best apply our expertise. We need to be forward thinking and proactive. We must ensure that our measurement infrastructure meets the needs of those we serve.

NIST is your partner in the evolution of technology and commerce. NIST can help support your priorities and assist you in developing the tools you need to do your jobs ever better. Change also requires learning. Since July of last year, the NIST team has trained some 880 weights and measures officials across the nation and helped them earn a total of over 1400 continuing education units. And the people trained at NIST go on to train thousands more.

The NIST Office of Weights and Measures training program regularly receives re-accreditation from the International Association of Continuing Education and Training.

We provide this accredited program of training because we recognize its importance in achieving uniformity and "fixing the standard of weights and measures" as it is laid out in the Constitution. It is one of the reasons for which NIST was established in the first place—to support and maintain the nation's measurements needed for commerce.

And also why each of you are vital, for your states, and for American prosperity with integrity. Infrastructure and methods must change with the times to fit the needs of each generation and the introduction of new technologies.

Our NIST staff will always be on hand to give you the technical support you need. We will help assure the traceability of your state calibration laboratories. We'll also provide insights into emerging technologies and the markets they will open, and we'll introduce you to experts in those new industries.

So, let's keep looking ahead. Let's set our gaze to our future horizon and prepare now for the arrival of these new products, new business models, new ways to deliver value, and novel ways to buy and sell. We are in a brave new world of weights and measures. This is a time of great innovation. We'll be creative and strategic in our thinking. I know that, together, we can rise to any challenge the future may bring!

Thank you all for the great work you do!

Chairman's Address

National Conference on Weights and Measures

Tulsa, Oklahoma

July 19, 2018

Brett Gurney
Utah Department of Agriculture and Food Division of Regulatory Services

It is a great honor and pleasure to be standing here as your new National Conference on Weights and Measures Chairman. Thank you for entrusting me to be in this position.

I want to thank those who have served on any committees, subcommittees, sectors, task groups or in any other capacity for your service to this conference. I want to thank the Board of Directors for all they do. Dedication, time and hard work are involved in each meeting.

I want to thank you for your participation and activities within your own regions. Thank you for participating in this conference.

I want to thank the Utah Department of Agriculture and Food, Commissioner LuAnn Adams, Scott Ericson, and Travis Waller for their progressive attitude for Weights and Measures and allowing and encouraging me to participate in this great organization. And thank you to my staff at home for all they do.

Thank you to my wife, Cindy, and my family for their support in my duties and responsibilities that come with this position.

Thank you to the previous chairmen and those who have offered their help and advice. Jimmy Cassidy; it has been a pleasure to serve with you this past year as the Chair-Elect.

Thanks to the NCWM staff for making this conference a great success. Thanks to the Associate Membership. Thank you to NIST for all of their technical expertise.

As I traveled this past year as Chair-Elect to the regions I found dedicated, motivated, and a hardworking people with a common goal. I met many who have a great passion for the weights and measures profession. Each regional conference was unique. Each one did a fantastic job. Each one had the same goal in mind. "That equity may prevail." I met many individuals that are new to the Weights and Measures profession. I hope you will allow yourself to get involved. Ask to get involved. Let us know how we can help you.

At each region I asked the following question. When you were in grade school how many of you dreamed about working in a weights and measures related profession? Very few hands would go up. For a group of people who had very little aspirations to work in a Weights and Measures field you sure have become experts in the Weights and Measures profession.

of Nigeria and Ronny Cornelis and Robert Peterson of Curacao (KER-A SOW) We welcome you and hope you will continue to participate in our Conference.

A goal of mine is to continue to outreach to jurisdictions who may not be participating frequently in our organization. A task group has been formed to find ways to outreach to the State jurisdictions and those jurisdictions that are in leadership transition. It's important to have all jurisdictions be a part of our conference. The NCWM can gain so much from having them involved. Likewise, each jurisdiction can gain so much from being involved in the NCWM.

Just a couple of days ago I heard from David Palacious, Enforcement and Compliance for the Commonwealth of the Northern Marianna Islands. Just over 1½ years ago I had a great opportunity to travel to the Northern Marianna Islands to teach as an instructor the NIST Handbook 133 course to them and 6 other jurisdictions in the Micronesia area. David thanked me and our organization for helping with their Weights and Measures Program.

Have you ever thought about the impact this body has on measurements in the United States? Have you ever thought of the impact your participation in the conference has on ourselves, your industry, your jurisdiction, your administration your region, and The National Conference on Weights and Measures?

The answers to these questions are huge!!! Your participation has a huge impact. It is so important that we do our jobs the right way. It is so important we follow a traceable, recognized system. Our nation's citizens and businesses depend on us.

A focus of Weights and Measures is to assure consumers get what they paid for and that businesses get paid fairly for the goods and services they sell. Foster fair competition. Have a fair marketplace for all parties.

The theme I have selected for this year is *"Valued Traditions & New Innovations – Confidence in Every Transaction"*.

Inspectors of Weights and Measures have been doing the same job for many, many years. Verifying and testing.

Just as in times of old, measurements are important. In the beginning, earlier measurements were taken in different ways. A handful, a scoop, a pinch, or a full stretch of the arms were used. Standards were needed. And Standardization was achieved.

We use measurement standards to make sure scales, gas pumps, meters, packages and other devices are fair.

As time marches on, the way we purchase items, and the way we measure continues to advance. We improve measurement standards every year as we deliberate at this conference. We live in an ever-changing world. New technology. New products. New ways to weigh and measure commodities.

We have heard the definition of the Kilogram may soon change. Sometimes our process, our inspection procedures must change to meet new technologies, new products, and new ways of doing business. Exciting times, new challenges, new opportunities are before us. Integrity of measurements continues to be important.

We have to work together to keep up with the times. We have to know how handle all of these situations. Traceability of measurements is going to continue to be important. Today, businesses and consumers trust measurements in the market place are both correct and accurate.

We must continue to be proactive. The future is bright with new technology, Weights and Measures will need to be part of this future.

We must remember valued traditions are important and keep up with technology, new innovations, and maintain confidence in the marketplace.

We need to be innovative. We live in an ever-changing world where technology is changing quickly. It is so important for our organization to be at the forefront. Working to come up with better solutions to the way we do things. Get involved and help us all be successful.

As Steve Jobs once said, *Great things in business are never done by one person. They're done by a team of people.*

We have a great team of people in our membership at the NCWM. I invite you to be part of our team. Remember, our common goal. "That equity may prevail."

Thank you for being part of this great conference. I look forward to working with you as we progress into the future. I look forward to being your partner. Our nation's citizens and businesses depend on us.

I want to take this opportunity to announce and make the following appointments:

Specifications and Tolerances Committee
Mr. Loren Minnich, Kansas (1-year term)
Mr. Jason Glass, Kentucky (5-year term)

Laws and Regulations Committee
Mr. Doug Rathbun, Illinois (5-year term)
Associate Member – Mr. Prentiss Searles - American Petroleum Institute (5-year term)

Professional Development Committee
Mr. Scott Fergusen, Michigan (5-year term)
Mr. James Pettinato – FMC Technologies Measurement Solutions, Inc. (5 years)

Nominating Committee (1-year term)
Committee Chair – Mr. Jimmy Cassidy
Northeastern Representative – Mr. Kenneth Ramsburg, Maryland
Central Representative – Mr. Ron Hayes, Missouri
Southern Representative – Mr. Stephen Benjamin, North Carolina
Western Representative – Ms. Kristin Macey, California
Active Member – Mr. Mark Coyne, Town of Sharon Massachusetts
Active Member – Mr. Tim Lloyd, Montana

Parliamentarian
Mr. Louis Straub – Fairbanks Scale, Inc. (1-year term)

Credentials Committee
Mr. Stuart Strnad – Texas (3-year term)

Presiding Officers
Central – Mr. Doug Musick, Kansas
Northeastern – Ms.Jane Zulkiewicz, Town of Barnstable, Massachusetts
Southern – Mr. Tim Chesser, Arkansas
Western – Mr. Kevin Schnepp, California

Chaplain
Mr. Constantine Costoradis – Flint Hills Resources (1-year term)

Sergeant of Arms
Mr. Jacques Daniel – WI
Mr. Greg Loreck- WI

Thanks again to all the committees for their work. I am proud of their willingness to serve. I also want to thank the new appointees for serving the Conference. Again, it is a privilege and an honor to serve and work with you as your NCWM Chairman.

Thank you!

Brett Gurney, NCWM Chairman

Roll Call of the States

The Roll Call of the States is taken at the commencement of the Voting Session of the Annual Meeting.

Alabama	Kentucky **(X)**	Northern Mariana Islands
Alaska **(X)**	Louisiana **(X)**	Ohio **(X)**
American Samoa	Maine **(X)**	Oklahoma **(X)**
Arizona **(X)**	Maryland **(X)**	Oregon **(X)**
Arkansas **(X)**	Massachusetts **(X)**	Pennsylvania **(X)**
California **(X)**	Michigan **(X)**	Puerto Rico
Colorado **(X)**	Minnesota **(X)**	Rhode Island
Connecticut **(X)**	Mississippi **(X)**	South Carolina
Delaware	Missouri **(X)**	South Dakota **(X)**
District of Columbia **(X)**	Montana	Tennessee **(X)**
Florida **(X)**	Navajo Nation	Texas **(X)**
Georgia **(X)**	Nebraska	Utah **(X)**
Guam	Nevada **(X)**	Vermont **(X)**
Hawaii	New Hampshire	Virgin Islands
Idaho **(X)**	New Jersey **(X)**	Virginia **(X)**
Illinois **(X)**	New Mexico **(X)**	Washington **(X)**
Indiana **(X)**	New York **(X)**	West Virginia **(X)**
Iowa **(X)**	North Carolina **(X)**	Wisconsin **(X)**
Kansas **(X)**	North Dakota	Wyoming

PRESENT **(X)**: 41
ABSENT: 16

103rd NCWM Annual Meeting/Award Recipients

Anniversary Awards

5 Years Attendance
Ruben Arroyo
Ronny Cornelis
Scott Ferguson
Ron Gibson
Ronald Johnson
Michael Lynch **(absent)**
John McGuire
Doug Musick
Tyler Reeder
Gene Robertson
Scott Simmons
Roberta Willhite
Michelle Wilson
Elaine Vieira
Russ Vires

10 Years Attendance
Rex Brown
David Calix
Ivan Hankins
Ryanne Hartman
William Hornbach
Russ Lewis
Kristin Moore
Rebecca Richardson
Tim White

15 Years Attendance
Raymond Johnson
Jack Walsh

20 Years Attendance
Stacy Carlsen

25 Years Attendance
Marilyn Herman
Neal Nover

40 Years Attendance
Ross Andersen

Special Recognition Awards

Presiding Officers

Tim Chesser, Arkansas
Kevin Merritt, Idaho
Loren Minnich, Kansas
Jack Walsh, Town of Wellesley, Massachusetts

Chaplain

Constantine Cotsoradis, Flint Hills Resources

Parliamentarian

Lou Straub, Fairbanks Scale, Inc.

Sergeants-at-Arms

Mike Bookout, Oklahoma
Scott Novak, Oklahoma
Jarrod Sanders, Oklahoma

Nominating Committee

Stephen Benjamin, North Carolina
Mark Coyne, City of Brockton, Massachusetts **(absent)**
Frank Greene, Connecticut
Ivan Hankins, Iowa
Richard Lewis, Georgia
Kristin Macey, California, as Chair **(absent)**

Credentials Committee

Chairman – Lori Jacobson, South Dakota

Associate Membership Committee

Chairman – Bill Callaway, Crompco
Vice-Chair – Mark Flint, ADM
Secretary/Treasurer – Bob Wiese, Northwest Tank and Environmental Services

COMPLETING TERMS

Board of Directors

Chuck Corr, Archer Daniels Midland Co. (At-Large)
Kenneth Ramsburg, Maryland, Active Membership (Southern)

Laws and Regulations Committee

John Albert, Missouri
Rebecca Richardson, MARC-IV Consulting

Professional Development Committee

Lori Jacobson, South Dakota
Richard Shipman, Rice Lake Weighing Systems, Inc.

Specifications and Tolerances Committee

Tim Chesser, Arkansas

CONTRIBUTIONS AWARD

Marilyn Herman, Washington, District of Columbia
Randy Jennings, Nashville, Tennessee

DISTINGUISHED SERVICE AWARD

Stephen Benjamin, Raleigh, North Carolina
Jerry Buendel, Olympia, Washington
Georgia Harris, Gaithersburg, Maryland
Paul A. Lewis Sr, Rice Lake, Wisconsin

LIFETIME ACHIEVEMENT AWARD

Aves Thompson, Anchorage, Alaska

Lifetime Achievement Award

Qualifications:[1] This award recognizes members that are by and large well-known and highly regarded for their outstanding performance and contributions to NCWM. No more than one (1) award can be granted annually. The recipient will have been a member of NCWM for at least ten years. Nominees will be considered based on the following characteristics:

Integrity: Their contributions based on unbiased input in such a manner that members are confident that the only motivation is for the improvement the organization and our work products.

Leadership: Their contribution in leading NCWM Committees, Sub-Committees, Sectors, Task Forces, Ad Hoc Assignments, work as Appointive Officials, or other displays of leadership that have advanced the NCWM toward becoming an overall better organization. The individual selected for this award will have displayed sound decision-making capabilities, communication skills, motivational skills, and a tolerance for the views of others.

Figure 1. Lifetime Achievement Award recipient, Mr. Aves Thompson (center), receives his award from Mr. James Cassidy, NCWM Chair (left), and President Dr. Walter Copan, NIST Director (right).

[1] The criteria for special awards were obtained from the NCWM website at **www.ncwm.net**.

Distinguished Service Award

Qualifications: This award recognizes members that have made a long-term commitment of service and leadership to NCWM. The recipient will have been a member of NCWM for at least ten years and made significant contributions to the enhancement of the organization as a whole through committee service, important contributions to standards development, served as a resource for knowledge, promoted the vision for NCWM, or other long-term commitments that have advanced the mission of NCWM. Please note it is not necessary for the nominee to have provided contributions in each category.

Figure 2. Distinguished Service Award to Mr. Stephen Benjamin (North Carolina)

Mr. Stephen Benjamin (center), receives the Distinguished Service Award form Mr. James Cassidy, NCWM Chairman (left) and Dr. Walter Copan, NIST Director (right).

Figure 3. Distinguished Service Award to Mr. Jerry Buendel (Washington State).

Mr. Jerry Buendel (center), receives the Distinguished Service Award from Chairman; Mr. James Cassidy, NCWM Chairman (left), and Dr. Walter Copan, NIST Director (right).

Figure 4. Distinguished Service Award to Ms. Georgia Harris (NIST Office of Weights and Measures) Ms. Georgia Harris (center), receives the Distinguished Service Award form Mr. James Cassidy, NCWM Chairman (left) and Dr. Walter Copan, NIST Director (right).

Figure 5. Distinguished Service Award to Mr. Paul Lewis (retired Rice Lake Weighing)

Mr. Paul Lewis (center), receives the Distinguished Service Award from Chair Mr. James Cassidy, NCWM Chairman (left), and Dr. Walter Copan, NIST Director (right).

Contributions Award

The NCWM Contributions Award recognizes members who have made notable contributions to NCWM standards, policy, administrative support or other services deemed worth of recognition. Recipients have been NCWM members for at least five years.

Figure 6. Outstanding Contributions Award to Ms. Marilyn Herman (second to left) and Mr. Randy Jennings (second to right) receive the Outstanding Contributions Award from Mr. James Cassidy, NCWM Chairman (left) and Dr. Walter Copan NIST Director (right)

NCWM Board of Directors

2018 Final Report

Mr. James Cassidy, Chairman
City of Cambridge, Massachusetts

INTRODUCTION

This is the report of the Board of Directors (BOD) (hereinafter referred to as the "Board") for the 103rd Annual Meeting of the National Conference on Weights and Measures (NCWM). This report is based on the Interim Report offered in the NCWM Publication 16, "Board Report," testimony heard at public hearings, comments received from the regional weights and measures associations and other parties, the addendum sheets issued at the Annual Meeting, and actions taken by the membership at the voting session of the Annual Meeting. The voting items presented below were adopted as presented when this report was approved.

Table A identifies the agenda and appendix items by reference key, title of item, page number, and the appendices by appendix designations. The acronyms for organizations and technical terms used throughout the agenda are identified in Table B. The first four digits of an item's reference key are assigned from the Subject Series List. The status of each item contained in the report is designated as one of the following: **(D) Developing Item:** the Committee determined the item has merit; however, the item was returned to the submitter or other designated party for further development before any action can be taken at the national level; **(I) Informational Item:** the item is under consideration by the Committee but not proposed for Voting; **(V) Voting Item:** the Committee is making recommendations requiring a vote by the active members of NCWM; **(W) Withdrawn Item:** the item has been removed from consideration by the Committee.

Table C provides a summary of the results of the voting on the Committee's items and the report in its entirety. Some Voting Items are considered on an individual basis; others may be grouped in a consent calendar. Consent calendar items are Voting Items that the Committee has assembled as a single Voting Item during their deliberation after the open hearings on the assumption that the items are without opposition and will not require discussion. The Voting Items that have been grouped into consent calendar items will be listed on the addendum sheets. Prior to adoption of the consent calendar, the Committee entertains any requests from the floor to remove specific items from the consent calendar to be discussed and voted upon individually.

Proposed revisions to the handbook(s) are shown as follows. 1) deleted language is indicated with a **bold face font using ~~strikeouts~~** (e.g., **~~this report~~**), and 2) proposed new language is indicated with an **underscore bold faced font** (e.g., **new items**). When used in this report the term "weight" means "mass".

Note: It is the policy to use metric units of measurement in publications; however, recommendations received by NCWM technical committees and regional weights and measures associations have been printed in this publication as submitted. Therefore, the report may contain references to U.S. customary units.

Subject Series List

Table A
Table of Contents

Appendices

Table B
Glossary of Acronyms and Terms

Acronym	Term	Acronym	Term
AMC	Associate Membership Committee	NTEP	National Type Evaluation Program
NCWM	National Conference on Weights and Measures	OIML	International Organization of Legal Metrology
NIST	National Institute of Standards and Technology	OWM	Office of Weights and Measures

Details of All Items
(In order by Reference Key)

ACT - ACTIVITY REPORTS

ACT-1 I Membership

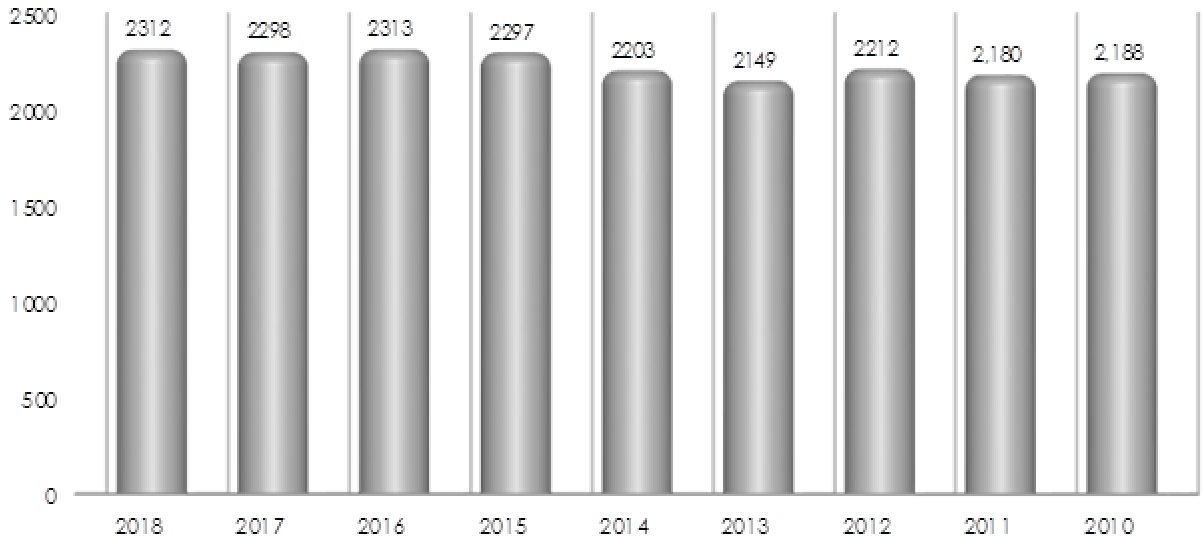
Membership

The chart and graph below show NCWM membership levels as of June 30 of recent years by membership categories. October 1 is the lowest level of membership for every fiscal year because it is the day that any memberships that were not renewed become lapsed. Significant growth is realized throughout the following 12 months as additional members renew and new members are received. The potential growth remains significant and NCWM continues to enhance programs and services that add value to membership.

Annual Membership Totals

Year / Type	June 2018	June 2017	June 2016	June 2015	June 2014	June 2013	June 2012	June 2011	June 2010
Associate	780	817	803	806	802	818	842	813	814
Foreign Associate	90	87	89	76	64	50	58	62	53
Total Associate	**870**	**904**	**892**	**882**	**866**	**868**	**900**	**875**	**867**
State Government	696	658	675	665	603	558	589	567	565
Local Government	479	474	492	491	492	486	487	495	524
Total Active	**1175**	**1132**	**1167**	**1156**	**1095**	**1044**	**1076**	**1062**	**1089**
NIST	15	16	14	16	16	16	16	16	12
Other Federal Government	11	10	11	11	9	10	11	11	12
Foreign Government	16	14	14	13	13	13	14	14	12
Retired	225	222	215	219	207	198	195	202	196
Total Advisory	**267**	**262**	**254**	**259**	**242**	**237**	**236**	**243**	**232**
Grand Total	**2312**	**2298**	**2313**	**2297**	**2203**	**2149**	**2212**	**2180**	**2188**

Annual Membership Totals as of March31, Each Year



ACT-2 I Meetings

The 103rd Annual Meeting will be held at the Hyatt Regency Tulsa Hotel located in the heart of downtown Tulsa, Oklahoma's vibrant business, entertainment, and cultural districts. The hotel overlooks the scenic gardens of the Williams Center Complex and is only eight miles from Tulsa International Airport. The hotel is adjacent to the famous Tulsa Performing Arts Center and just a few walking blocks from many dining and entertainment venues. For more information about the 103rd Annual Meeting, go to **www.ncwm.net/sems/event_detail/2018-annual-ok** or contact Ms. Elisa Stritt, NCWM Office Manager, at (402) 434-4872 or **elisa.stritt@ncwm.net**.

In January 2019, NCWM will hold the Interim Meeting at the Francis Marion Hotel, Charleston, South Carolina. This location was a favorite of attendees in 2013. It is a beautiful historic hotel situated perfectly for attendees to get the full Charleston experience. For more information about this meeting, contact Ms. Elisa Stritt, NCWM Office Manager, at (402) 434-4872 or **elisa.stritt@ncwm.net**.

Interim Meetings:
- January 13-16, 2019 Francis Marion Hotel, Charleston, South Carolina
- January 26-29, 2020 The Mission Inn Hotel & Spa, Riverside, California
- January 8-14, 2021 Sirata Beach Resort & Conference Center, St. Petersburg, Florida

Annual Meetings:
- July 14-18, 2019 104th Annual Meeting: Hyatt Regency Hotel, Milwaukee, Wisconsin
- July 12-16, 2020 105th Annual Meeting: Hotel Murano, Tacoma, Washington
- July 2021 Location to be determined in the Northeastern Region

The Board of Directors strives to plan meetings in locations that have reasonably priced airline service and are within government per diem rates. The board also evaluates locations and bids from hotels based on their ability to offer comfortable rooms, quality meeting space and a variety of nearby entertainment and dining options.

ACT-3 I Participation in International Standard Setting

Dr. Charles Ehrlich (NIST OWM) provided a report for review at the 2018 NCWM Interim Meeting in St. Pete, Florida. An updated report is also included as an appendix to this agenda of the Board of Directors. (See Appendix A.) The Board of Directors expresses appreciation to Dr. Charles Ehrlich for his report and for the important efforts of the NIST Office of Weights and Measures around the world.

See the NTEP Committee Agenda for additional reports on NCWM's involvement internationally, including the Mutual Recognition Arrangement (MRA) with Measurement Canada and the OIML Certificate System (CS).

ACT-4 I Associate Membership Committee Activity

The Associate Membership Committee (AMC) is organized in accordance with the Bylaws of the National Conference on Weights and Measures, Inc. In addition, AMC operates by its own Bylaws which are available on the Committee pages of **www.ncwm.net**. AMC meets at least 2 times per year in conjunction with NCWM Interim and Annual Meetings. It consists of between 5 and 10 members who, amongst themselves, elect officers to serve as Chair, Vice-Chair, and Secretary/Treasurer. See Appendix B for information on current members and officers.

AMC has established a reputation of promoting and improving NCWM and has demonstrated its desire to improve understanding of weights and measures activities in public and private sectors.

The NCWM membership dues for Associate members of $90 are $15 higher than that for Active or Advisory members. The extra $15 is not for NCWM, but rather is placed in a separate account referred to as the AMC Fund. While AMC has discretion to allocate the funds in various ways, one means of allocating these funds is to provide grants in support of weights and measures training. The Committee receives applications and awards training grants from the AMC fund in accordance with their "Guidelines for Selection and Approval of Training Funds" which are posted on the Committee's webpage on **www.ncwm.net**. Downloadable applications for training grants and reimbursement forms are also available at this site.

The criteria to receive AMC funds for training are as follows:

1. Funding request forms that are complete, specific and detailed will receive priority attention for approval. Based on the degree of missing or ambiguous information provided, individual requests may not be given any consideration during the AMC review process pending further clarification.

2. Training requests that benefit higher numbers of participants are generally preferred over those for fewer or single-person benefit. Multi-state training that encourages uniformity will also be given priority consideration.

3. In general, attending meetings such as NCWM Annual Meetings, Interim Meetings or regional associations meetings will not be considered training.

4. As a lower priority, requests for the purchase of training materials will be considered, but requests for purchase of assets (such as projectors) will not.

5. Reasonable funding for travel and expenses will be considered if it is necessary to acquire an "expert trainer" that would benefit a high number of weights and measures officials. This will be an option when qualified volunteers are not available.

Regulatory agencies are encouraged to make use of these funds to improve training opportunities and the expertise of inspection personnel.

AMC members are also looking for new, perhaps innovative ways to play a more effective role in the NCWM structure to further improve the organization.

The AMC will meet during the 2018 Interim Meeting on Tuesday evening, January 23 at 5:00. All Annual meeting attendees, especially NCWM Associate members are encouraged to attend. (See Appendix B for the AMC Meeting Minutes from July 2017.)

The Board of Directors expresses its appreciation to the Associate Membership Committee for its efforts to promote and improve NCWM programs and activities and the many training events around the country through AMC funding.

ACT-5 I Task Groups, Subcommittees, Steering Committees

Focus Groups, Task Groups, Subcommittees, Steering Committees:
Focus groups, task groups, subcommittees and steering committees are created by the NCWM Chairman and operate as defined in NCWM Policy 1.5.1. Subgroups Supporting the Work of the Organization. A task group is given a specific charge and it reports to the appropriate NCWM standing committee. A task group will disband at the completion of its assignment. A subcommittee is charged with ongoing responsibilities in support of a standing committee in a specific field of expertise. A steering committee is charged with unbiased fact-finding that will assist NCWM membership in decision processes for difficult issues. A steering committee will disband upon completion of its specific charge.

NCWM offers resources to these task groups and subcommittees including meeting space at Interim and Annual Meetings, conference calling and web meeting services, group email services, a dedicated web page for posting and archiving documents related to their work, and broadcast e-mail services to reach targeted audiences. Additionally, NIST OWM has provided technical advisors and web meeting forums. These tools enable year-around progress of task group and subcommittee work.

Because NCWM task groups and subcommittees are part of the NCWM organizational structure and report directly to its standing committees, their proposals may possibly appear in NCWM Publication 15 without first being vetted through a regional association. Any such proposals are properly vetted through the open hearings of NCWM.

The Promotional Toolkit Task Group reports to the Board of Directors. Among the activities of this group, it has developed 4 videos, each showcasing inspection activities in the supermarket, scale inspections, retail motor fuel dispenser inspections, and motor fuel quality. Mr. Stephen Benjamin (North Carolina) reported on behalf of the Promotional Toolkit Task Group that a 5th video was shot recently on package inspections. Suggestions for additional videos include LPG meter inspections, grain moisture meters, and possibly two videos on metrology; one focused on the laboratory and the other linking this to the field.

Mr. Alan Walker (Florida) reported that the WIM Task Group will submit an information paper to the regions this fall in their ongoing effort to put standards in Handbook 44 for these types of devices.

A new Safety Task Group was formed under the leadership of Julie Quinn of Minnesota to report to the Professional Development Committee. The task group was upgraded to subcommittee at the 2018 Annual Meeting. It will identify the common safety hazards encountered by inspectors and the resources available to mitigate those hazards. The subcommittee will also focus on areas where resources are lacking and how those resources can be developed. Reporting of this subcommittee will appear in the Professional Development Committee report.

Reporting to the Board of Directors:

Charter Team on Improving the Standards Development Process:

Chair
Mr. Jerry Buendel
Washington Department of Agriculture
P.O. Box 42560
Olympia, WA 98504
Phone: (360) 902-1856
Email: **jbuendel@agr.wa.gov**

Promotional Tool Kit Task Group:

Chair
Mr. Stephen Benjamin
North Carolina Department of Agriculture
Raleigh, NC 27699
Phone: (919) 707-3225
Email: **steve.benjamin@ncagr.gov**

Cannabis Task Group:

Chair
Mr. James Cassidy
City of Cambridge, Massachusetts Weights and Measures Department
831 Massachusetts Drive
Cambridge, MA 02139
Phone: (617) 349-6133
Email: **jcassidy@cambridgema.gov**

State Outreach Task Group:

Chair
Mr. Brett Gurney
Utah Department of Agriculture and Food
P.O. Box 146500
Salt Lake City, UT 84114-6500
Phone: (801) 538-7458
Email: **bgurney@utah.gov**

Reporting to the Laws and Regulations Committee:

Fuels and Lubricants Subcommittee:

Chair
Dr. Bill Striejewske
Nevada Division of Measurement Standards
405 S 21st St.
Sparks, NV 89431
Phone: (775) 353-3792
Email: **wstriejewske@agri.nv.gov**

Packaging and Labeling Subcommittee:

Chair
Mr. Christopher Guay
Procter and Gamble Co.
One Procter and Gamble Plaza
Cincinnati, OH 45202
Phone: (513) 983-0530
Email: **guay.cb@pg.com**

Reporting to the Specifications and Tolerances Committee

Credit Card Skimmer Task Group:

Chair
Mr. Hal Prince
Florida Department of Agriculture and Consumer Services
2360 Lakeview Ave.
Clermont, FL 34711
Phone: (850) 921-1570
Email: **harold.prince@freshfromflorida.com**

Weigh-in-Motion Vehicle Scale Task Group:

Co- Chair
Mr. Alan Walker
Florida Bureau of Standards
6260 Buckingham Rd
Fort Meyers, FL 33905
Phone: (850) 274-9044
Email: **Alan.Walker@freshfromflorida.com**

Co- Chair
Mr. Tim Chesser
Arkansas Bureau of Standards
4608 West 61st Street
Little Rock, AR 72209
Phone: (501) 570-1159
Email: **tim.chesser@aspb.ar.gov**

Reporting to the Professional Development Committee

Safety Subcommittee:

Chair
Ms. Julie Quinn
Minnesota Weights and Measures Division
14305 South Cross Drive
Suite 150
Burnsville, MN 55306
Phone: (651) 539-1555
Email: **julie.quinn@state.mn.us**

ACT-6 I Regional Association Activities

Fall 2018 Meetings

WWMA Annual Meeting
September 16-20, 2018
Cheyenne, Wyoming
Contact: Bob Weidler **robert.weidler@wyo.gov**
Kevin Merritt **kevin.merritt@isda.idaho.gov**

NEWMA Interim Meeting
October 2-4, 2018
Norwich, Connecticut
Contact: James Cassidy **jcassidy@cambridgema.gov**

SWMA Annual Meeting
October 7-10, 2018
Jacksonville, Florida
Contact: Hal Prince **harold.prince@freshfromflorida.com**

CWMA Interim Meeting
October 15-17, 2018
St. Charles, Missouri
Contact: Sherry Turvey **sherry.turvey@kda.ks.gov**

SPB - STRATEGIC PLANNING, POLICIES, AND BYLAWS

SPB-1 I Strategic Planning

The Executive Director presents a Strategic Plan progress report each year at the fall Board Meeting. The Board conducts a strategic planning session every other year in January at its quarterly meeting just prior to the Interim Meeting. The last session was held in January 2018 and the next strategic planning session will be Friday, January 24, 2020 in Riverside, California prior to the NCWM Interim Meeting. Members can review the Strategic Plan online at **www.ncwm.net** in the "About" section. The Board welcomes member input. Suggestions may be submitted to Executive Director Don Onwiler at **don.onwiler@ncwm.net**.

There are five Goals in the NCWM Strategic Plan:

1. Enhance NCWM as a national and international resource for measurement standards development.
2. Expand the role of NCWM as a resource for state and local weights and measures programs.
3. Promote uniform training for individuals involved in weights and measures.
4. Continue to improve NTEP.
5. Preserve the financial stability of NCWM.

Goal 1: Enhance the National Conference on Weights and Measures as a national and international resource for standards development:

Under this goal, NCWM has recognized the benefit of participating in other organizations where appropriate as a means of drawing on mutual resources toward common goals and heightening awareness of NCWM. This has been very successful in recent years. In 2018, a new task group has been formed to review NCWM membership levels of inactive states and their participation at the regional level and develop a plan for outreach to inactive states.

Also, as part of this goal, NCWM is hoping to increase stakeholder participation in NCWM through outreach efforts.

Goal 2: Expand the role of the National Conference on Weights and Measures as a source of support for state and local weights and measures programs:

NCWM uses press releases to raise the level of recognition for NCWM and its membership as a resource for expert information in a vast array of topics.

Another part of this goal is to conduct surveys on occasion that benefit our members. In some cases, surveys are used to create benchmarks for comparison with future surveys.

A task group was formed and continues its work to develop a "toolkit" of items that can be used by program administrators to generate awareness and support for their programs. This toolkit is available on the NCWM website at **www.ncwm.net/resource/promotional-toolkit**. North Carolina took the lead in developing the videos and some are now available on the NCWM website and NCWM YouTube channel. The Board of Directors and the Associate Membership Committee have each pledged matching funds toward additional video productions.

Goal 3: Enhance the technical competence of individuals involved in weights and measures:

The Professional Certification Program has been a high priority under this goal. Mr. Ross Andersen serves as Certification Exam Coordinator working with the Professional Development Committee and Subject Matter Experts. Volunteer Subject Matter Experts are needed in the areas of Precision Scales, LP Gas Meters and Price Verification. Anyone interested in assisting the writing and reviewing exam questions should contact NCWM

The Professional Development Committee is also worked with Mr. Andersen to develop two basic level exams; one for weighing devices and the other for metering devices. These exams will be used to test service agents and also for inspectors who are completing their initial training. See more discussion on this in the Professional Development Committee report.

Goal 4: Continue to improve the National Type Evaluation Program:

As part of this goal, NCWM created a robust online database for NTEP Certificates of Conformance. Later, NCWM launched a mobile version of the website that also featured this searchable database. This has greatly improved access to certificates for inspectors, service agents, and others working in the field.

Other strategies in Goal 4 are toward training for applying information from NTEP Certificates of Conformance, maintaining viable laboratory support through authorized labs and international agreements and continued implementation of the Verified Conformity Assessment Program. Backlog for evaluations has been virtually eliminated as NTEP strives for a high level of customer service and support.

Goal 5: Preserve the financial stability of NCWM:

The Board has studied potential hazards that could present a burden on NCWM's financial reserves so that the organization may be prepared. This is being balanced with continued efforts to improve services in support of customers and membership. The Board closely monitors the financial health of the organization through monthly reports and formal reviews at each of the board meetings. An independent audit of NCWM finances is conducted at the close of each fiscal year.

On odd years, NCWM is conducting a comprehensive survey of state weights and measures programs on staff, funds and scope of programs. On even years beginning in 2018, NCWM is conducting a survey on fuels and lubricants quality inspection programs.

SPB-2 A Improve the NCWM Standards Development Process

Source:
NCWM Board of Directors (2016)

Purpose:
Assess the NCWM standards development process to determine ways to improve efficiency and participation.

Background/Discussion:
This item is assigned to the NCWM Charter Team for development and recommendations.

At the 100th NCWM Annual Meeting in 2015, several members suggested to the Board of Directors that the standards development process could be improved upon in ways that would make it move more efficiently and at the same time encourage broader attendance and participation by stakeholders. Some suggestions included modeling NCWM's process to be more like an ANSI process and possibly voting on standards twice per year instead of once.

In January 2016, then NCWM Chairman Mr. Jerry Buendel formed a Charter Team and set out four phases in developing recommendations to improve the standards development process. The Charter Team evaluated the NCWM's existing process and outline its strengths and weaknesses and reported back to the Board of Directors in July 2016. The team identified potential changes to existing NCWM processes and considered their impact on operation of Regional Associations, NIST, NCWM governance and others to provide adequate regulations to users on a timelier basis.

The Charter Team has offered two concepts for consideration by the Board. Concept 1 is a series of recommendations to improve our existing process for standards development. Some of those recommendations have already been put in place while others will require further discussion. Concept 2 is to hold voting sessions at both, the January and July meetings of NCWM. The Board of Directors will present recommendations for discussion to determine most appropriate course for the future.

Concept 1: Improving the Current Model

- Better controls of time for presentations and comments during open hearings
- Managing testimony on Informational, Assigned and Developing items
- Reformatting of Publications 15 and 16 by grouping similar items
- Limitations on the ability to carry over items to the next year
- Increased emphasis on committee training
- Increased structure for subgroups such as task groups
- Regional committee training
- Improved quality of new proposals and the evaluation of them by regional associations.
- Improved committee reports that provide concise summaries and rationale

Concept 2: Voting Twice Each Year

- Two regions receive new proposals in the fall and the other two receive new proposals in the spring
- No item could come to a vote before all 4 regions have reviewed
- Items that carry over would only wait 6 months instead of 12 for further consideration.
- Length of committee agendas would be reduced through more frequent voting.

Full details of these concepts are contained in the Charter Team Report in Appendix C.

Since the existing standards development process and voting system are defined in NCWM Bylaws, there is probability that any solutions would be brought to a vote of the general NCWM membership in the form of bylaw amendments.

NCWM tested a new format for the committee agendas for the 2018 Interim Meeting that incorporated 2 changes. Feedback was positive, so the changes have been retained for Publication 16 for the July 2018 Annual Meeting.

- **BLOCKS OF ITEMS:** In some cases, there may be proposed changes affecting multiple codes that share the same purpose or proposed changes to one code may be dependent on the adoption of proposed changes to another. The Committee may group such items into "Blocks" to facilitate efficient handling for open hearings and voting. These blocks are identified in Committee's agenda.

- **ITEM NUMBERING:** The system for numbering agenda items has changed for 2018 from a numeric system to an alpha-numeric system. For example, a proposal to amend the NIST Handbook 44 General Code would be item "GEN-1" instead of item "3100-1".

Charter Team Members are:

Jerry Buendel, Chairman	Washington State	Western Region
Louis Sakin	Towns of Hopkinton/Northbridge	Eastern Region
Rob DeRubeis	Michigan	Central Region

Hal Prince	Florida	Southern Region
Eric Golden	Cardinal Scales Mfg.	Associate Membership
Rob Upright	Vishay Transducers	Associate Membership
Don Onwiler	NCWM	
Dr. Doug Olson	NIST OWM	

The Board of Directors believes that this process should be slow and deliberate so that any action taken will be well-conceived and in the best interest of NCWM and its stakeholders. The Board will communicate with membership throughout this process in open hearings, the newsletter, NCWM Publication 15 agendas and NCWM Publication 16 reports.

In open hearings of the 2018 Annual Meeting, Charter Team Chair, Mr. Buendel summarized the recommendations the Team has developed. There was considerable discussion at their meeting this week regarding concerns that items under Developing status might not receive due process before upgrading to Voting status unless stakeholders are allowed to comment on them in Open Hearings. Several ideas were put forward as a remedy. One is to allow comments at Interim meetings, but not at Annual Meetings. This way, comments at the annual meetings might result in upgrading the item for the next Annual without having limited due process. Another suggestion is to have committees review items in early November that were Developing or Assigned to determine if their status should be raised for the Interim Meeting prior to publishing of NCWM Publication 15. A third idea was to declassify all carryover items after the Annual Meeting, take comments on all items at the Interim Meeting and then reassign a status for the next Annual Meeting.

Mr. Onwiler presented a new template for Committee reports which was developed by a focus group of the standing Committee Chairs and him earlier this year. The template is designed to provide more concise and consistent reports that better serve the reader in gleaning important content. It would also simplify the report-writing for committees if used as intended. An example was presented where a current item on the S&T Committee agenda was reduced from 6 pages to 4 pages without losing the important content on discussions and committee actions. See Attachment I for the template. Comments were generally supportive of the proposed report format provided important context is retained in the effort to be concise. Another suggestion would be to timeline the actions of the committee in the report. For developing items, the developer could add to this report format based on written comments they receive from stakeholders. This would ensure that comments submitted to them are not lost as the item moves forward.

Chairman Cassidy requested that the Team evaluate the effectiveness of those recommendations and modifications of our process that have already been put into place.

SPB-3 I Publication and Distribution of NCWM Work Products

Source:
Packaging and Labeling Subcommittee (2015)

Purpose:
Develop a plan for publication and distribution of new NCWM work products.

Background/Discussion:
The NCWM Package and Labeling Subcommittee (PALS) is developing a document that provides principles and recommendations to capture best practices for the many kinds of existing quantity related statements which appear on package Principal Display Panels (PDPs). These are statements which are present in addition to the required declaration of net quantity. The practice of adding these expressions has increased significantly over the past decade and it is recognized that some statements can help consumers make fair value comparisons while others arguably may confuse or mislead consumers.

The principles and recommendations under development by PALS are intended to provide both manufacturers and regulators with a standard and guidance regarding best practices for these kinds of statements to provide increased uniformity and statement integrity. Rather than attempt to create regulations covering these topics, which would require involvement of multiple federal agencies, PALS believes that the development of principles and recommendations provides an actionable and reasonable approach for bringing standardization and consistency to this topic.

This project is a two-step process.

1. Identify and remove any policies and guidelines published in Appendix D of NIST Handbook 130 that are obsolete.
2. Leave remaining items in the handbook, but also reorganize them into a new electronic publication which will expand as new guidance documents or policies are developed.

A focus group within the Board of Directors provided the following recommendations for these guidance documents:

- Create a new tab on the website that would also have the handbooks.
- Duplicate the Interpretations and Guidelines in Section VI of Handbook 130, reorganize them by topic and post them to the website in the same tab.
- Guidance documents should be adopted by a vote of membership under the Board agenda or appropriate standing committee.
- Modify Form 15 to accommodate proposals related to the guidance documents
- In the process, also simplify Form 15.

The reorganized Interpretations and Guidelines from Handbook 130 were presented at the May 2016 Board Meeting. At that meeting, Mr. Ken Butcher, NIST/OWM, explained that these were originally developed to provide leverage for enforcement agencies. NIST OWM provided a review and identified sections that are obsolete, recommending they be removed. The L&R Committee presented those recommendations in 2017 and they were adopted by NCMW. The reorganized version has been posted to for download at **www.ncwm.net/publications.**

The simplified Form 15 was approved and implemented immediately. The form was also modified to include its use in recommending changes to the new guidance document.

SPB-4 I Policy 3.2.2. Procedures to Modify Handbooks (Creating "Assigned" status)

(This policy change was adopted by the Board in January 2018)

Source:
NCWM Board of Directors (2017)

Purpose:
Streamline the open hearings by establishing a status for items that have been assigned to a subcommittee, steering committee or task group for development whereby the standing committee will refrain from taking comments until it receives recommendations that can be presented for discussion.

Item under Consideration:
Amend NCWM Policy 3.2.2. Procedures to Modify Handbooks as follows:

G. Interim Meeting

1. The Committee shall hold public hearings at the Interim Meeting for the purpose of discussing and taking comments on ~~**all**~~ agenda items.

2. Upon request, the Committee will provide the opportunity for presentations by government officials, industry representatives, consumer groups, or other interested parties during the Interim Meeting. Requests to make presentations must be received by the Committee Chairman or Technical Advisor at least two weeks prior to the start of the meetings.

H. Interim Meeting Report

1. Items under consideration by the Committee, and about which the Committee offers comments or recommendations to NCWM to act upon during the Annual Meeting, will be included in the Committee's Interim Report published in the Annual Meeting Program and Committee Reports (NCWM Publication 16).
2. The Annual Meeting Program and Committee Reports will be prepared and distributed to Conference members approximately three months prior to the NCWM Annual Meeting.

I. Classifications for Agenda Items

At the Interim Meeting, the Committee can classify proposals in one of three ways as:

1. "**Voting**" - These are items the Committee believes are fully developed and ready for final consideration of the voting membership. Each item has either received majority support from the Committee or the Committee has reached agreement that it is ready for voting status to let NCWM membership decide. The Committee has the ability to remove items from the voting agenda at the Annual Meeting by changing the status prior to a vote of the NCWM membership. The Committee may amend voting items during the course of the Annual Meeting based on additional information received following the Interim Meeting and testimony received at the Annual Meeting. These items may also be amended by the voting membership during the voting session of the Annual Meeting following the procedures outlined in the NCWM Bylaws; or

2. "**Informational**" - These items are deemed by the Committee to have merit. They typically contain a proposal to address the issue at hand and a meaningful background discussion for the proposal. However, the Committee wants to allow more time for review by stakeholders and possibly further development to address concerns. The Committee has taken the responsibility for any additional development of Informational items. For particularly difficult items, the Committee may assign the item to an existing Subcommittee under its charge or request that the NCWM Chair appoint a special task group that reports to the Committee. At the Annual Meeting, the Committee may change the status of the items, but not to Voting status because the item has not been published as such in advance of the meeting; or

3. "**Developing**" - These items are deemed by the Committee to have merit but, are found to be lacking enough information for full consideration. Typically, the item will have a good explanation of the issue, but a clear proposal has yet to be developed. By assigning Developing status, the Committee has sent the item back to the source **for** ~~**or assigned it to some other entity outside the scope of the Committee with the responsibility of**~~ further development. The Committee Report will provide the source with clear indication of what is necessary to move the item forward for full consideration. The item will be carried in the Committee agenda in bulletin board fashion with contact information for the person or ~~**organization that is**~~ responsible for the development. Since the Committee is not required to receive testimony on developing items, this status should be carefully implemented so as not to weaken the standards development process; or

4. **"Assigned" - These items are deemed by the Committee to have merit but are found to need further development before being considered by the Committee. Typically, the item will have a good explanation of the issue, but a clear proposal has yet to be developed and the committee thinks further development should be conducted by a subcommittee, steering committee or task group. The Committee Report will provide the designated group with clear direction and expectations. The item will be carried in the Committee agenda in bulletin board fashion and will include contact information for the chairperson of the responsible subcommittee, steering committee or task**

<u>group. Since the item is being developed by a designated group outside of the Committee, the Committee will not receive testimony during open hearings on assigned items, however a representative of the responsible group will provide a brief progress report on the development efforts. An assigned item will be returned to the Committee when the responsible group feels the item is fully developed or that no further progress can be made in developing the item. A Committee may revoke the assigned status at any time.</u>

5. "**Withdrawn**" - These are items that the Committee has found to be without merit. The Committee's determination to withdraw should not be based on the Committee's opinion alone, but on the input received from stakeholders. The Committee's report will contain an explanation for the withdrawal of the item. Once an item appears in NCWM Publication 16 as Withdrawn, the status of that item may not be amended. The item may be reintroduced through the regional associations for consideration as a new item.

(Amended 2013)

Background/Discussion:
In recent years, open hearings have exceeded the allotted time. Much of the testimony during these open hearings is being spent on items that are still under development by a subcommittee or task group. The Board of Directors believes that debates and testimony during open hearings should be spent on items where the "item under consideration" has been developed and is being presented for action by the standing committee and NCWM membership.

Under this proposal, the standing committee agenda would identify those items that are assigned by the committee to a subcommittee, steering committee or task group with the status "Assigned". Those items with that status will not be discussed in open hearings other than an optional update report from the Chairman of the group that is developing a recommendation. When the committee receives a recommendation to present as the "Item under Consideration", the committee would change the status to "Informational" or "Voting" to allow for the normal vetting through open hearings.

Mr. Chuck Corr (ADM and at-large officer on the Board of Directors) provided a presentation at the 2017 Interim Meeting explaining this proposed additional agenda item status. The item prompted several comments regarding various elements of the current process including the following.

- Consider a deadline for Developing Items to be developed so they don't linger too long on agendas.
- Create a forum separate from the committee agendas to discuss Developing Items.
- Bring back the Online Position Forum, but as a "Discussion Forum"
- Put the assigned developer of an item in control of the content for that item in Publications 15 and 16.
- Do not bring Developing Items up for open hearing discussions until they are developed.
- Provide an example of a properly developed item that is ready for consideration.

The establishment of an "Assigned" status would focus discussion of those items to the appropriate venue such as a subcommittee or task group until they are ready for consideration by the larger body in open hearings. All activities would provide full transparency.

The following is an example of how "Assigned" items would be handled in Publication 15 and 16 committee agendas. This example is representative of the Laws and Regulations Committee.

<u>Sample Agenda Index:</u>

<u>Sample Agenda Item:</u>

2801 FUELS AND LUBRICANTS SUBCOMMITTEE ACTIVITY REPORTS

Note: The following items have been assigned to the Fuels and Lubricants Subcommittee for development. The Chair or other representative of the subcommittee will provide an update report on these items during open hearings. See Appendix A, page XX for additional background and discussion on these items.

2801-1 A Uniform Regulation for the Method of Sale of Commodities, Section 2.XX. Automatic Transmission Fluids

Source:
American Petroleum Institute (2016)

Purpose:
Define how transmission fluids shall be identified in the marketplace on delivery documents and invoices and receipts from service.

Item under Consideration:
This item is being developed by the Fuels and Lubricants Subcommittee.

Background/Discussion:
See Appendix A, Page XX

SPB-4 I Policy 3.2.2. Procedures to Modify Handbooks (Deadline for Proposals)

(This policy change was adopted by the Board in May 2018)

Source:
NCWM Board of Directors (2018)

Purpose:
Establish one deadline for receiving new proposals for consideration by the four regional associations.

Item under Consideration:
Amend Policy 3.2.2. Procedures to Modify Handbooks as follows:

C. Procedures
The NCWM Committee will consider items according to the following procedures:

1. **<u>New items submitted to the NCWM by September 1 in Microsoft Word format using the form 15 available from NCWM.</u>**
2. **<u>Items accepted by a regional association after the September 1 deadline and included in the regional recommendations to NCWM by November 1.</u>**

3. **Items submitted by NCWM committees, subcommittees, task groups, NTEP sectors etc. directly to NCWM standing committees. It is recommended that these items be submitted to all regional associations for review if possible.**
4. NCWM Committees receive new items **from 1, 2 and 3 above** ~~**from regional associations, National Type Evaluation Technical Committees (Sectors), task groups, and subcommittees**~~ and as defined in Sections E and F. All items to be considered by the Committee for action at the upcoming Interim Meeting must be submitted ~~**electronically**~~ in Microsoft Word format to NCWM by November 1.
5. NCWM will ensure that all committee members and technical advisors receive complete copies of the form 15 and all supporting documents for all new items for consideration at the upcoming NCWM Interim Meeting.

Background/Discussion:
This proposal was further developed at the May 2018 Board of Directors Meeting prior to being approved.

Each regional association sets its own deadline for receiving new proposals. In recent years, it has been standardized among the regions to be 2 weeks prior to the fall regional meetings. This means there are 4 separate deadlines; one for each region.

NCWM staff receive all proposals from the submitters on NCWM Form 15. Staff incorporate those new items into the master copy of Publication 15 which is used as the agendas of the committees at the NCWM Interim Meeting in January. Since there are 4 deadlines, each region has a unique set of committee agendas and there can be no standard numbering of agenda items from one region to the next since new items are inserted into the agenda as they are submitted and in the order of the sections of handbooks to be modified.

This proposal sets just one deadline for all proposals submitted to NCWM. This will aid in the following objectives:

- Each region will receive an identical set of committee agendas for consideration in the fall.
- New items will be numbered in the same manner as will appear in NCWM Publication 15.
- Standardized regional agendas will lend less confusion for those who attend more than one region.
- It will greatly reduce staff time at NCWM in preparing a master copy and 4 unique regional copies of each committee agenda.

The Board recognizes that it cannot dictate deadlines to regions. This is a NCWM deadline whereby NCWM will not incorporate any items into the fall regional agendas after that date. Preliminary feedback from regions has been supportive of this approach and the Board hopes that the regions will ultimately declare a deadline uniform with that of NCWM.

SPB-5 I Exam Proctoring

(This item was approved by the Board of Directors at their May 2018 Quarterly Meeting)

Source:
Professional Development Committee (2018)

Purpose:
Establish proctoring guidelines for Basic Level Exams and Professional Certification Exams.

Item under Consideration:

Guidelines for Proctoring Professional Certification Exams

Rules for the Candidate

- Only Handbooks and reference materials provided by the proctor may be used.
- All questions on the exam are copyrighted by the NCWM. NO copying or sharing of the questions or answers is permitted in any form without expressed written approval of NCWM.
- Calculators may be used for the exam if they have been approved or supplied by the proctor. Approved models may have scientific and statistical functions and be capable of storing numeric values. Programmable calculators are not permitted, i.e., capable of storing multiple operation functions and calculation sequences.
- While taking the NCWM exam, candidates are not permitted to:
    - Receive assistance from any other person in answering questions;
    - Access email, software applications, apps, or websites other than the NCWM testing service;
    - Possess cameras, cell phones, or memory devices, such as flash drives; or
    - Rewrite or copy questions or answers, in whole or in part. Candidates may use note paper, provided by the proctor, to perform calculations. All paper will be collected by the proctor at the end of the exam and will be destroyed.
- Candidates shall not write in the reference materials provided by the proctor and shall return any computers, calculators, or reference materials provided by the proctor in good condition.

Qualifications for Proctors

- Independent party, e.g., Human Resources representative, or an individual with limited conflict of interest and is removed from direct weights and measures training responsibilities, e.g., Administration;
- Chosen by the State or local jurisdiction; and
- Approved by NCWM.

Rules for the Proctor

- Sign an agreement with NCWM acknowledging responsibilities and duties as a proctor.
- Provide a suitable environment for the candidate to take the exam and where the candidate's activities can be closely monitored. Space should be free from outside noise, interruptions, etc.
- Provide a computer with internet capability for the exam.
- Provide copies of reference materials used by the candidate that are clean and free of margin notes or highlights. Exams are Open Book but limited to the following:
    - 1) NIST Handbooks such as Handbook 44, Handbook 133, and/or Handbook 130, as appropriate to the exam
    - 2) Other reference materials as specifically provided in the exam announcement, such as NIST Examination Procedure as applicable to the exam, Handbook 112 Examination Procedure Outline(s) for devices included in the exam, and reference tables.
- Provide 3 sheets of blank copy paper for calculations. Additional sheets may be requested if required.

- Approve candidate's calculator or supply an 8-digit scientific calculator with statistical functions for mean and standard deviation. Approved models may have scientific and statistical functions and may store values in memory. Programmable calculators are not permitted, i.e., capable of storing multiple operation functions and calculation sequences. If the calculator is provided by the proctor, ensure the candidate has time to become familiarized with the operations before the exam begins.

- Access the NCWM testing service through the NCWM website and enter the log-in credentials for the candidate.

- During the exam, the proctor shall ensure the candidate:

    - Does not receive assistance from any other person in answering the exam questions;
    - Does not access email, software applications, apps, or websites other than the NCWM testing service;
    - Does not possess or operate cameras, cell phones, or memory devices such as flash drives;
    - Does not rewrite or copy questions or answers, in whole or in part; or
    - Uses only note paper provided by the proctor to perform calculations.

- Answer questions from the candidate only regarding the operation of the computer or the calculator provided by the proctor.

- After the candidate completes the exam, collect and account for all paper provided to the candidate and destroy any paper written on by the candidate.

- Ensure all computers, calculators, and reference materials provided by the proctor are returned by the candidate in good condition.

Background/Discussion:
The Professional Development Committee has developed the proctoring guidelines to meet the objective of the Board of Directors to have the Professional Certification Program accredited and to provide security and integrity for the basic level exams which are designed in part to serve as testing for registered service agents.

These guidelines apply to both, candidate and the proctor. For the candidate, the guidelines will prohibit bringing materials into or taking materials out of the exam, having a cell phone activated, accessing the internet or other computer programs while taking the exam, etc. For the proctor, the guidelines will establish who can serve as a proctor (with approval of NCWM). The Professional Development Committee is considering the possibility of state weights and measures divisions providing the proctor but recommends that the proctor be someone other than an immediate supervisor. The Committee suggests appointing someone from the personnel department, an independent third party, or possibly private proctoring services. The guidelines specify what the proctor must provide to the candidate, such as scrap paper, clean copies of pertinent NIST Handbooks, computer access, a quiet environment to take the exam, etc. It further requires the proctor to collect all scrap paper, as no materials may be removed from the testing site to protect the integrity of the questions.

The Board of Directors reviewed the recommendations from the committee and has questioned the statement, "Under certain conditions, an approved and suitable computer may be provided by the candidate for exam use." The Professional Development Committee reassessed the rules and removed that statement. The proctor will be responsible for providing the computer.

The Board of Directors approved the proctoring guidelines as presented above.

SPB-6 I Basic Exam Fees

Source:
Board of Directors (2018)

Purpose:
Establish a fee structure for Basic Level Exams intended for service agents and new inspectors.

Background/Discussion:
The board established prices for the basic exams to mirror the price structure for professional certification.

Member price: $0
Nonmember Price: $75

The exams are completed and will be made available through the NCWM website once the proctoring system is approved and in place. The process of purchasing basic level exams will the same as exists now for the professional certification exams.

FIN - FINANCIAL

FIN-1 I Treasurer's Report

NCWM operates on a fiscal year of October 1 through September 30. Budgets are set to be conservative on projected revenues and realistic on anticipated expenses. In 2017, the Board implemented a 10-year forecasting method to assist in the budgeting process.

The following is the balance sheet as of June 30, 2018 in comparison with the same time the previous year. Assets include an Associate Membership Fund. At the request of the associate membership, this fund was created through the additional $15 dues paid by associate members. The Associate Membership Committee has full control in how these funds are spent in accordance with the its committee bylaws.

ASSETS	**June 30, 2018**	**June 30, 2017**
Current Assets	$	$
Checking/Savings		
Associate Member Fund	30,116.84	25,517.49
Certificates of Deposit	1,361,672.28	1,232,848.39
Checking	23,322.25	1,539.55
Savings	236,912.45	315,751.13
Total Checking/Savings	1,652,023.85	1,575,656.56
Accounts Receivable	5,672.93	38.00
Other Current Assets	56,878.20	72,872.70
Other Assets	23,514.84	17,818.54
TOTAL ASSETS	**1,738,089.82**	**1,666,385.80**
LIABILITIES & EQUITY		
Liabilities		
Current Liabilities	48,066.71	43,406.48
Total Liabilities	48,066.71	43,406.48

Equity		
Designated - Associate Membership	30,105.21	25,517.49
Unrestricted Net Assets	1,433,192.74	1,418,856.63
Net Income	226,725.16	178,605.20
Total Equity	1,690,023.11	1,622,979.32
TOTAL LIABILITIES & EQUITY	**1,738,089.82**	**1,666,385.80**

Mr. James Cassidy, City of Cambridge, Massachusetts | Chairman
Mr. Brett Gurney, Utah | Chair-Elect
Ms. Kristin Macey, California | NTEP Committee Chair
Mr. Raymond Johnson, New Mexico | Treasurer
Mr. Mahesh Albuquerque, Colorado | Active Membership - Western
Mr. Craig VanBuren, Michigan | Active Membership - Central
Mr. Kenneth Ramsburg, Maryland | Active Membership - Southern
Mr. Jack Walsh, Town of Wellesley, Massachusetts | Active Membership - Northeastern
Mr. Christopher Guay, Procter and Gamble | Associate Membership Representative
Mr. Chuck Corr, Archer Daniels Midland Co. | At-Large
Ms. Julie Quinn, Minnesota | At-Large

Mr. Don Onwiler, NCWM | Executive Director
Dr. Douglas Olson, NIST, OWM | Executive Secretary
Mr. Jim Truex, NCWM | NTEP Administrator
Mr. Carl Cotton, Measurement Canada | Board of Directors Advisor

Board of Directors

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Appendix A

Report of the Activities of the International Organization of Legal Metrology (OIML) and Regional Legal Metrology Organizations

National Institute of Standards and Technology (NIST), Office of Weights and Measures (OWM)

INTRODUCTION

The OWM at NIST is responsible for coordinating United States participation in OIML and other international legal metrology organizations. Learn more about OIML at **www.oiml.org** and about NIST, OWM at **www.nist.gov/owm**. Dr. Charles Ehrlich, Program Leader of the International Legal Metrology Program, can be contacted at (301) 975-4834 by fax at (301) 975-8091 or **charles.ehrlich@nist.gov**.

Note: OIML publications are available electronically without cost at **www.oiml.org**.

Table A
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Table B
Glossary of Acronyms and Terms

Acronym	Term	Acronym	Term
ANSI	American National Standards Institute	ISO	International Standardization Organization
APEC	Asia-Pacific Economic Cooperation	IWG	International Work Group
APLMF	Asia-Pacific Legal Metrology Forum	LMWG	Legal Metrology Work Group
APMP	Asia-Pacific Metrology Program	MAA	Mutual Acceptance Agreement
B	Basic Publication	MTL	Manufacturers' Testing Laboratory
BIML	International Bureau of Legal Metrology	NIST	National Institute of Standards and Technology
BIPM	International Bureau of Weights and Measures	NTEP	National Type Evaluation Program
CD	Committee Draft[1]	OIML	International Organization of Legal Metrology
CIML	International Committee of Legal Metrology	OWM	Office of Weights and Measures
CTT	Conformity to Type	PG	Project Group
D	Document	R	Recommendation
DD	Draft Document[2]	SC	Technical Subcommittee
DoMC	Declaration of Mutual Confidence	SIM	Inter-American Metrology System
DR	Draft Recommendation[2]	TC	Technical Committee
DV	Draft Vocabulary[3]	USNWG	U.S. National Work Group
GA	General Assembly	VIM	International Vocabulary of Metrology
IEC	International Electrotechnical Commission	VIML	International Vocabulary of Legal Metrology
IQ Mark	International Quantity Mark	WD	Working Draft[3]

[1] CD: a committee draft at the stage of development within a technical committee, subcommittee or project group; in this document, successive drafts are numbered 1 CD, 2 CD, etc.
[2] DD, DR, and DV: a draft document approved at the level of the technical committee, subcommittee or project group concerned and sent to BIML for approval by CIML.
[3]WD: working draft that precedes the development of a CD; in this document, successive drafts are number 1 WD, 2 WD, etc.

Details of All Items
(In order by Reference Key)

I. REPORT ON THE ACTIVITIES OF THE OIML TECHNICAL COMMITTEES

This section reports on recent activities and the status of work in the OIML Technical Committees (TCs), Technical Subcommittees (SCs), and Project Groups (PGs) of specific interest to members of the National Conference on Weights and Measures (NCWM). Schedules of future activities of the TC/SC Secretariats, PG Conveners, the U.S. National Work Groups (USNWGs), and the International Work Groups (IWGs) and Project Groups of the TCs and SCs are also included.

TC 3/SC 5 Conformity Assessment (United States)

See the new section on the OIML Certification System (OIML-CS), found at the end of this Section of Appendix A.

TC 5/SC 1 Environmental Conditions (Netherlands)

OIML D 11 *General requirements for measuring instruments - Environmental conditions* is a very important document in the OIML system and is used by all of the OIML TCs as a general reference for technical and testing requirements on all measuring instruments. Highlights of the most recent revision cycle include: expanding the terminology section, updating several testing sections to reflect the latest International Electrotechnical Commission (IEC) reference standards, and including a new environmental class ("E3") for a non-mains local source of electrical power supply. Please contact Mr. Ralph Richter at (301) 975-3997 or **ralph.richter@nist.gov**, if you would like additional information on TC5/SC1 or OIML D 11.

TC 5/SC 2 Software (Germany and BIML)

A project to revise OIML D 31 *General Requirements for Software-controlled Measuring Instruments* has started. This is an important document that serves as guidance for the software requirements in all of the OIML International Recommendations. This project group now also includes methods and means of software verification into its responsibilities.

The Project Group had its first meeting in September 2017 at PTB in Berlin, Germany. Attendees provided their inputs to the first working draft (1WD) which was subsequently consolidated by the conveners and circulated for comment as 1CD. In parallel, the conveners organized two subgroups, composed primarily of the US and Germany, to draft language pertaining to operating systems and software validation. These discussions were carried out by video conference and correspondence. A second project group meeting was held in April 2018 at NMi in Dordrecht, the Netherlands during which comments on 1CD were discussed and consolidated. These will be circulated later in 2018 for review. A third subgroup has been formed to clarify the usage of the terms "measurement value," "measurement data," and "measurement result." Parties interested in these OIML software efforts should contact Dr. Katya Delak at (301) 975-2520 or **katya.delak@nist.gov** if they would like to participate or provide input.

TC 6 Prepackaged Products (South Africa)

A new publication, OIML G 21, entitled "*Guidance for Defining the Requirements for a Certification System for Prepackages*" was just published in December 2017. This guideline was developed to assist countries in establishing reciprocal agreements to accept the test results on prepackaged goods.

A new edition of OIML Recommendation R 87 "*Quantity of Product in Prepackages*" (equivalent to NIST Handbook 133 "Checking the Net Contents of Packaged Goods") was published on the OIML website in January 2017. This new edition includes a comprehensive overhaul of the statistical requirements and sampling plans. The U.S. and several other countries were successful in opposing efforts by several European Union countries to add drained weight test procedures and packaging requirements utilized in that region to the new edition of R87. Those procedures were rejected primarily because they failed to recognize drained weight test methods that have been in use around the world for decades and which have been adopted by Codex Alimentarius.

OIML R 79 *Labeling Requirements for Prepackaged Products* has also been published. For more information or to participate in the activities of this committee, please contact Mr. Ken Butcher at (301) 975-4859 or **kbutcher@nist.gov**.

TC 8 Measurement of Quantities of Fluids (Japan)

Based on responses received on a questionnaire concerning several projects in TC 8, Japan has decided to cancel a project to combine and revise R 40, R 41 and R 43 into a single standard entitled *Standard volumetric measures.* Japan has also decided to delay the project to revise R 63 *Petroleum Measurement Tables* (1994) until the corresponding ISO standard is next revised. The Secretariat plans to start the revision of R 119 *Pipe Provers for Testing of Measuring Systems for Liquids Other Than Water* (1996) – this document is important for other OIML Recommendations involving liquid measurement. Please contact Mr. Ralph Richter at (301) 975-3997 or **ralph.richter@nist.gov**, if you would like copies of any of these documents or to participate in the project to revise R 119.

TC 8/SC 1 Static Volume and Mass Measurement (United States and Netherlands)

The United States and The Netherlands became the new Co-Secretariats of TC 8/SC 1 after Germany announced that it wished to step down as Secretariat. The United States chairs the Project Groups that are revising OIML R 71 *Fixed Storage Tanks* and R 85 *Automatic Level Gages for Measuring the Level of Liquid in Fixed Storage Tanks* to add specific requirements for specialized tanks. The 2CDs of R 71 and R 85 are planned to be distributed for project group vote and comment in 2018. The Subcommittee has discussed the importance of revising OIML R 125 *Measuring Systems for the Mass of Liquids in Tanks*, and a new project to revise R 125 has been approved by the CIML. Part 2 and Part 3 of OIML R 80, *Road and Rail Tankers with Level Gauging,* received final CIML approval in October 2017 and were published in November 2017. A meeting of TC 8/SC 1 is being planned for late 2018 in The Netherlands. Please contact Mr. Ralph Richter at (301) 975-3997 or **ralph.richter@nist.gov**, if you would like copies of the documents or to participate in any of these projects.

TC 8/SC 3 Dynamic Volume and Mass Measurement for Liquids Other Than Water (United States and Germany)

This subcommittee continues the effort on a project for the revision of all three parts of R 117 *Dynamic Measuring Systems for Liquids Other Than Water*. This project will fully harmonize all three parts and add new annexes to R 117 for several complete measuring systems, including: (a) measuring systems for the unloading of ships' tanks and for rail and road tankers using an intermediate tank, (b) measuring systems for liquefied gases under pressure (other than LPG dispensers), (c) measuring systems for bunker fuel, and (d) measuring systems for liquefied natural gas (LNG). The 2CD of R 117 is expected in 2018. If you have any questions or would like to participate in this project, please contact Mr. Ralph Richter at (301) 975-3997 or **ralph.richter@nist.gov**.

TC 8/SC 6 Measurement of Cryogenic Liquids (United States)

The Secretariat for OIML R 81, *Dynamic Measuring Devices and Systems for Cryogenic Liquids* has distributed a first committee draft (1CD) of R 81 to Project Group members and the USNWG for their review and comment. These comments have now been resolved, and a 2CD is anticipated to be distributed later in 2018. To obtain more information or to participate in this project, please contact Mr. Ralph Richter at (301) 975-3997 or **ralph.richter@nist.gov**.

TC 8/SC 7 Gas Metering (Netherlands)

All three parts of OIML R 137 *Gas Meters* have been published. Extensive United States comments on the 1 CD, the 2 CD, and the DR were developed in cooperation with the measurement committees of the American Gas Association. The OIML R 137 document is especially important to the U. S. interests because the American National Standards

Institute (ANSI) B 109 committee on gas measurement is using the published R 137 to create a new performance-based standard for gas meters in the United States. Please contact Mr. Ralph Richter at (301) 975-3997 or **ralph.richter@nist.gov**, if you would like to participate in these efforts or if you would like to obtain a copy of any of these gas measurement documents.

The Netherlands and Japan serve as Co-Conveners on a new project to revise OIML R 139, *Compressed gaseous fuel measuring systems for vehicles* that will mostly focus on ensuring that the Recommendation fully and accurately includes proper requirements and test procedures for hydrogen fuel dispensers. This standard is important to US stakeholders, especially in the effort to maximize harmonization between domestic and international legal metrology requirements used for the delivery of alternative fuels. Two R 139 Project Group meetings have been held -- February 2017 in Tokyo, Japan, and September 2017 in Delft, The Netherlands. A 1CD of R 139 was distributed in May 2017. The 2CD passed the Project Group vote with 100% consensus in Feb 2018, and the CIML preliminary ballot closes in June 2018. It is expected that this revision of R139 will receive final CIML approval in October 2018. To obtain more information on this effort, please contact Mr. Ralph Richter at (301) 975-3997 or **ralph.richter@nist.gov**.

TC 9 Instruments for Measuring Mass (United States)

Votes and comments on the 5th Committee Draft (5CD) of all parts of R 60 *Metrological Regulation for Load Cells* (Metrological and technical requirements and Metrological controls and performance tests) were received and collated in January 2017. While the two-thirds majority needed for approval of the 5CD was exceeded, some Project Group members had submitted comments that implied there were a few significant issues that were unacceptable to those members. Considering that those significant issues could result in the rejection of the 5CD during a CIML preliminary ballot, it was decided that a subgroup be formed to resolve those few issues. A meeting of that subgroup (TC9/p1/SG1) was convened in March 2017 and resulted in additional revisions to the 5CD. These revisions alleviated the objections raised by the PG members working in the subgroup. The preliminary ballot passed, and R60 was approved by the CIML in Cartagena, Columbia, in October 2017. R60 was published early in 2018. For more information on TC 9 activities, please contact Mr. John Barton at (301) 975-4002 or **john.barton@nist.gov**.

TC 9/SC 1 Non-Automatic Weighing Instruments (Germany and France)

A new project to revise OIML R 76:2006 *Non-automatic weighing instruments* has been started. In addition to revising R 76, the project group has been requested to provide suggestions on how to best approach the verification and inspection of these kinds of measuring instruments. The first Project Group meeting was held in December 2017 in Braunschweig, Germany. Several Project Groups have been tasked with reformatting and updating the Recommendation and with developing field verification and inspection procedures for these measuring instruments. Other Groups will develop proposals for adding up-to-date software requirements and consider including new test procedures for modules. Please contact Mr. Ken Butcher at (301) 975-4859 or **kbutcher@nist.gov** if you are interested in the effort to revise this document.

TC 9/SC 2 Automatic Weighing Instruments (United Kingdom)

A Project Group has been formed to develop a new OIML Recommendation on *Continuous totalizing automatic weighing instruments of the arched chute type.* This type of measuring instrument measures centripital force on an arched chute. The first committee draft (1CD) of this new document was distributed in May 2018, following a teleconference meeting of the Project Group. To receive copies of the documents concerning this project or to obtain more information on the work of this subcommittee, please contact Mr. John Barton at (301) 975-4002 or **john.barton@nist.gov**.

The Preliminary Ballot of OIML R 61 *Automatic gravimetric filling instruments* was approved by the Project Group in June 2017, and R61 received final CIML approval in October 2017. The new document is expected to be published in 2018. The TC 9/SC 2 Secretariat distributed a questionnaire concerning a possible project to revise OIML R 51 *Automatic catch-weighing instruments,* which was last revised in 2006. The proposed international effort to revise R 51 was also announced by the NCWM. Please contact Mr. Rick Harshman at (301) 975-8107 or **richard.harshman@nist.gov** if you are interested in the project to revise this document.

TC 17/SC 1 Humidity (China and United States)

OIML R 59 *Moisture Meters for Cereal Grains and Oilseeds* has received final CIML approval, and it was published on the OIML website in March 2017. Please contact Ms. G. Diane Lee at (301) 975-4405 or **diane.lee@nist.gov** if you would like more information on this effort.

TC 17/SC 8 Quality Analysis of Agricultural Products (Australia)

The new OIML recommendation *Measuring Instruments for Protein Determination in Grains* received final CIML approval in October 2016. It was published as OIML R 146 on the OIML website in February 2017. Please contact Ms. G. Diane Lee at (301) 975-4405 or **diane.lee@nist.gov**, if you would like more information on this effort.

OIML Certification System (OIML-CS)

OIML has operated a Certificate System for OIML Type Evaluation of Measuring Instruments since 1991. The OIML Basic Publication B 3:1991 *Certificate System* (revised in 2006 and again in 2011) has underpinned the OIML Basic Certificate System, and OIML B 10:2012 *Mutual Acceptance Arrangement* (MAA) has underpinned the Mutual Acceptance Arrangement of the OIML Certificate System. The MAA provided more rigorous requirements for testing laboratories than the Basic Certificate System did. The categories of measuring instruments that were active under the MAA were load cells (OIML R 60), non-automatic weighing instruments (OIML R 76), and water meters (OIML R 49). NCWM/NTEP has participated in the MAA as a Utilizing Participant for load cells, and from January 2011 to September 2017 issued sixty-nine NTEP certificates for load cells under the MAA.

Because of difficulties encountered by the International Bureau of Legal Metrology (BIML) in adequately obtaining and summarizing peer review and/or accreditation data from the MAA test laboratories, and also to promote better awareness of the system, it was proposed that a more robust OIML Certification System (OIML-CS) be developed.

In 2015, OIML formed an Ad-Hoc Working Group (AHWG) on the OIML Certificate System that was tasked to develop a proposal that would significantly change the way that the OIML Certificate System is structured, managed and operated. This proposal included the creation of an OIML Certification System (called OIML-CS) that would be managed by a Management Committee instead of by the BIML. Advisory Committees to the Management Committee were also planned. The AHWG put its proposal forward to the CIML at its meeting in Arachon, France in October 2015, where it was approved. The AHWG was then disbanded, and a new certification system project group (CSPG) was established that prepared a draft of a proposed new framework document (OIML Basic Publication B 18:2016) establishing the OIML-CS, for voting on at the 2016 CIML Meeting (in Strasbourg, France). Prior to this CIML Meeting, a meeting of the CSPG was held (in Teddington, England) to resolve issues with the framework document, which permitted the framework document to be approved at the 2016 CIML Meeting. Also, approved at the 2016 CIML Meeting was the creation of a Preliminary Management Committee (PrMC), Chaired by Dr. Roman Schwartz. Draft Operational Documents for the OIML-CS were discussed at a meeting of the PrMC in February 2017 in Berlin, Germany. A second meeting of the PrMC was held in Shanghai, China in June 2017, where it was decided that the newly-formed Review Committee (that reviews all applicants to the OIML-CS and makes recommendations to the full Management Committee) would become part of the Management Committee. All of the OIML-CS documents were then approved (including the OIML-CS framework document OIML B 18:2017) at the 2017 CIML Meeting in Cartagena, Colombia.

Implementation of the OIML-CS began in January 2018. Load cells (R 60) and non-automatic weighing instruments (R 76) will enter under what is called Scheme A (an advanced level of the OIML-CS where accreditation or peer review is used as the basis for demonstrating compliance with the requirements of the OIML-CS for both OIML Issuing Authorities and Test Laboratories). Several other instrument categories (see the OIML web site, **www.oiml.org**, for a complete list) will enter under Scheme B (an introductory level of the OIML-CS where "self-declaration" is used as the basis for demonstrating compliance with the requirements of the OIML-CS). It is anticipated that most instrument categories will transition from Scheme B to Scheme A after two years.

Mr. Cock Oosterman (NMi, Netherlands) was appointed as the Management Committee Chairperson, and Mr. Bill Loizides (CIML Member from Australia) was appointed as the Deputy. Dr. Charles Ehrlich of NIST, and U.S. CIML

Member, will serve on the Management Committee of the OIML-CS. Mr. Darrell Flocken of NCWM/NTEP will serve on the Review Committee, which is now part of the Management Committee

If there are any questions about the new OIML-CS, or for more information, please contact Dr. Ehrlich at (301) 975-4834 or **charles.ehrlich@nist.gov**.

II. REPORT ON THE 52ND CIML MEETING IN CARTAGENA, COLUMBIA, IN OCTOBER 2017

On the day before the CIML Meeting officially started, a seminar was held to provide an overview of the new OIML Certification System. Having the theme of "Promoting Global Harmonization for Measuring Instruments," the seminar was largely run by Dr. Roman Schwartz (acting in his role as Chair of the OIML-CS Provisional Management Committee) and Mr. Paul Dixon (the BIML Leader of the effort to develop the OIML-CS).

Mr. Peter Mason, CIML member from the United Kingdom and President of the CIML, opened the CIML Meeting and gave the President's Report.

Following a call for candidates in 2017, the CIML elected its current First Vice President Prof. Roman Schwartz (PTB in Germany) to become the new CIML President for a six-year term. Dr. Schwartz assumed his duties during the first day of the CIML meeting.

Mr. Stephen Patoray (serving as BIML Director since January 2011) provided several reports on financial and administrative matters at the BIML, including improvements that have been implemented since his arrival at the BIML. Mr. Patoray's appointment as the BIML Director will end in 2018. The CIML plans to assemble a selection committee and advertise the position of BIML Director with the aim of appointing a new Director at its 53rd Meeting in 2018.

A search committee in 2017 recommended that Mr. Paul Dixon (United Kingdom) become the new BIML Assistant Director, filling a vacancy that was left by the death of Willem Kool in 2016. The CIML appointed Mr. Dixon to this position.

The CIML welcomed Cambodia as a new Member State; it also welcomed Bolivia, Ecuador, and the Philippines as new Corresponding Members.

A total of thirty-six Resolutions were passed by the CIML (the complete set of Resolutions can be found on the OIML web site **www.oiml.org/en/structure/ciml/sites**.) Some highlights of these Resolutions are reported below.

Several Resolutions were passed concerning the new OIML-CS (see the section on the OIML-CS in this report, above):

- It was noted that at the CIML meeting last year (in 2016), the CIML approved a document B18 "*Framework for the OIML Certification System* (OIML-CS)" and established a provisional Management Committee (PrMC) to transition to the new OIML-CS. A new revision of B18 was approved by the CIML at this meeting.

- The provisional Management Committee (prMC) will be disbanded on 31 December 2017; the new Management Committee (MC) will be in effect stating on 01 January 2018.

- CIML Members of OIML Member States that intend to have at least one Issuing Authority or Utilizer will designate representative(s) to serve on the MC.

- Mr. Cock Oosterman (NMi in the Netherlands) was appointed to serve as MC Chairperson and Mr. Bill Loizides (CIML Member from Australia) was appointed to serve as MC Deputy Chairperson.

- The BIML will continue to operate the existing Basic and MAA Certificate Systems until 31 December 2017. The CIML made decisions at this meeting on which categories of instruments would start to be covered by the different schemes of the OIML-CS on which dates.

The Final Draft revision of OIML B 6 *Directives for OIML technical work* was approved. The CIML requested that the Presidential Council evaluate, after an appropriate period (3–5 years) and in the light of experience gained, how well the Directives for OIML technical work are meeting the objectives of the Organization (e.g. speeding up the technical work and increasing participation) and to report back to the CIML.

The CIML approved the following Final Draft Recommendations:

- Revision of R 60, *Metrological regulation for load cells*;
- Revision of R 61, *Automatic gravimetric filling instruments*;
- Revision of R 80, *Road and rail tankers with level gauging*.

The CIML approved two new projects:

- the revision of OIML D 1:2012 *Considerations for a Law on Metrology* under the responsibility of the CEEMS Advisory Group;
- the revision of OIML D 2:2007 *Legal units of measurement.*

The CIML, recognizing the continued efforts that are needed to assist in building the capacity of legal metrology institutions and their staff in countries and economies with emerging metrology systems (CEEMS), instructed the Bureau to (1) continue its efforts to participate in capacity building activities through training courses and other regional activities organized by other organizations, and (2) further develop the OIML website such that it may be used as a source of up-to-date information on capacity-building initiatives, including training materials and, if feasible, a database of experts available to contribute to such work. The CIML also requested relevant Technical Committees and Subcommittees to take note of the demand from CEEMS to ensure Recommendations take more account of the needs of CEEMS. The newly formed CEEMS Advisory Group also held a meeting the week of the CIML meeting in Cartagena. Outgoing CIML President Peter Mason (retiring from United Kingdom government service) was awarded the title of CIML Member of Honor, in recognition of his work for the OIML. Mr. Alan Johnston (retiring from Measurement Canada) was also awarded the title of Member of Honor, in recognition of his work for the OIML over a period of 23 years and his service as both President of the CIML and a member of the Presidential Council.

III. FUTURE OIML MEETINGS

The 53rd CIML Meeting is being planned to be held 8-12 October 2018 in Hamburg, Germany.

IV. REGIONAL LEGAL METROLOGY ORGANIZATIONS

A meeting of the Inter-American Metrology System (SIM) General Assembly is organized annually and is the event where delegates from National Metrology Institutes of the Americas meet to discuss important issues. The past two years, the SIM General Assembly was held in Montevideo, Uruguay (November 2016) and in Panama City, Panama (October 2017).

The first face-to-face meeting of the SIM Legal Metrology Working Group (LMWG) in over ten years was held in Cartagena, Columbia, in October 2017 in conjunction with the 2017 CIML Meeting. The new Chairman of the SIM LMWG, Mr. Raimundo Alves de Rezende (of INMETRO, Brazil) opened the meeting and welcomed participants. (For the past several years, the Chair of the SIM LMWG was held by Argentina and no meetings had been conducted.) Several issues of importance to the SIM countries were discussed, including: recent weights and measures training that participants felt had been successful, how the new OIML-CS certification system would affect the weights and measures programs in each country, and the problems that many programs faced concerning adequate and stable access to resources. The meeting closed with a discussion on the future needs and expectations of each of their countries. Possible next steps and planning for future training and future LMWG communication and meetings were considered. There was a good consensus for Brazil to circulate a questionnaire/survey to member countries to gather information, especially concerning training needs. Please contact Mr. Ralph Richter at (301) 975-3997 or **ralph.richter@nist.gov** for more information on SIM and the activities of the SIM LMWG.

The 24th Meeting of the Asia-Pacific Legal Metrology Forum (APLMF) was hosted by Cambodia and was held in Siem Reap in October 2017. New Zealand assumed the APLMF Secretariat in 2016, and Mr. Stephen O'Brien of New Zealand's Ministry of Business, Innovation & Employment (MBIE) assumed the APLMF Presidency. Previously, the People's Republic of China held the Presidency and the Secretariat of APLMF for several years.

The main objectives of APLMF are to coordinate regional training courses in legal metrology and to provide a forum for exchange of information among legal metrology authorities. APLMF activities have been facilitated through its seven work groups. A meeting of the APLMF Working Groups (WGs) was held on the day prior to the APLMF meeting. The most active WG has been the Working Group on Training Coordination, chaired by Australia. Because of the importance of the training mission to APLMF, this WG has now become a permanent part of the APLMF Secretariat (instead of a separate WG). APLMF conducted four training courses in 2017: Verification of Rice Moisture Meters, Verification of Bulk Fuel Systems, Pattern Approval and Verification of Water Meters, and Verification of Weighbridges.

The results of a recent APLMF survey clearly indicated that the more than 20 courses conducted by APLMF in the last 10 years were highly valued by the member economies, promoted harmonization in the Asia-Pacific region, and frequently led to revised/improved legislation and regulations in the member economies.

A significant joint project entitled "Metrology Enabling Developing Economies in Asia" (MEDEA) has been conducted over the last three years by APLMF, the Asia Pacific Metrology Programme (APMP) and the Physikalisch-Technische Bundesanstalt (PTB). This four-year project has been managed by PTB and is primarily funded by Germany. The project aims to foster and further develop the capabilities of the APLMF and the Asia-Pacific Metrology Program (APMP) to support developing economies in the Asia-Pacific region, to promote metrology systems within developing economies, and to strengthen the metrology systems/infrastructure within developing economies.

Please contact Mr. Ralph Richter at (301) 975-3997 or **ralph.richter@nist.gov** for more information on APLMF and the 2018 APLMF Annual Meeting which will be held 7-9 November 2018 in Christchurch, New Zealand.

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Appendix B

Associate Membership Committee (AMC)
Agenda and Draft Meeting Minutes

Mr. Bill Callaway, Committee Chair
Crompco

Table A
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AMC Interim Meeting Minutes
Pittsburgh, PA
July 2017

Call to Order

The meeting was called to order at 4:03 p.m.

Approval of Minutes

The meeting minutes were reviewed and approved Minutes from the AMC meeting at the January 2018 Interim Meeting.

Financial Condition

- AMC has a total of $24,443.38 available.
- There are $2,840.10 in pending approved payments (Toolkit Task Group and Mississippi final reimbursement).
- $21,603.28 is available for consideration of new or amended applications
- Motion to approve financial statement made by Chris Guay, seconded by Mr. Robert Murnane. Motion approved by unanimous vote.

Board of Director's Update

Central Region:

- Interim CWMA at St Charles, Missouri October 15-17; Annual CWMA at Canton, Ohio May 6-9, 2019.
- Working on new Bylaws, will formalize two AMC members.

Northeastern Region:

- Interim NEWMA at Norwich, Connecticut October 2-4; Annual NEWMA at Portland, Maine if hotel is open.
- Annual meeting for 2020 set in Saratoga Springs, New York
- Massachusetts State Director - new recent posting, hoping to name new director later this year.

Southern Region:

- Florida upgrading training, equipment, and labs very significantly.
- Florida looking at having their staff become certified via NCWM Professional Certification.
- 2018 Annual Meeting in Jacksonville Omni, Florida October 7-10

Western Region:

- Inspector turnover is a problem in some states, certification is one avenue to improve retention
- Mr. Jerry Buendel (Washington) retiring at end of August 2018.
- California state employees are not present due to state restrictions, state/county travel bans
- Kurt Floren will be official state representative for 2018 NCWM Annual Meeting

- 2018 Annual Meeting will be in Cheyenne, Wyoming Sept 16-20.
- 2019 Annual Meeting expected to be in Park City, Utah (second or third week of September)
- Don Brewer (AK State Director) retiring before end of year.
- Colorado and New Mexico programs getting significant financial support.

NIST:

- Director of NIST Dr Walter Copan (NCWM Honorary Presidents) will be here for General Session
- Almost 50 training sessions conducted by NIST over the past year.
- Regional training for 2019 Regional Meetings is being solicited at this meeting.

Canada:

- Ms. Diane Allen has replaced Mr. Alan Johnson as head of Measurement Canada
- Moving forward with a revised enforcement process and training initiative
- Have a national integrated enforcement tracking process
- Can tell how many inspections, NOVs, fines, etc. they have nationally at any given time
- Database on gas pump and in-store scale compliance by province is available to the public.

Tours at NCWM Annual Meetings

- Over 100 have registered for Magellan tour at this meeting
- Tours at AMC member facilities at future Annual meetings (Milwaukee, Tacoma, etc.)

Board of Directors W&M Outreach/Involvement Team

- How can we get involvement of the W&Ms jurisdictions who are not participating?
- Focus should be through regional and more local communication
- Is there a role for the Associate Members to help?

Proctoring for Testing

- Requirements document and guidelines are set, will be deployed after Annual meeting.
- Tests will require a formal proctor starting around end of August 2018.

Charter Team

- Vision and Expectations
- Board looking at adding position to help standing committees/Committee Chairs

E-Commerce on Regional Websites for meetings, RMAP and training

- Regions payment systems need upgrading to avoid duplication errors, simplify management for regional treasurers to match upgrade NCWM has made. About $6 per region.
- Greatly upgrade e-commerce capabilities of regional sites

- Q: IS AMC willing to provide partial funding to support regional upgrades?
- NIST likely can contribute partial funding if all 4 regions want to upgrade

NCWM Merchandise

- Lanyards
- Shirts
- Hats
- Other

Safety Task Force is now a Subcommittee

Charter Team

- Developing Items
- Assess effectiveness of changes made to date
- Two voting sessions per year

Old Business

- Training Fund Application from California Division of Measurement Standards approved
- Training Fund Application from the State of Utah approved
- It was brought forward that there are a couple NCWM positions that may be opening up due to terms expiring.
    - The AMC seat on the PDC Committee expires in July. Mr. Jim Pettinato volunteered to go on the PDC Committee, and the AMC voted to nominate Jim for PDC.
    - Ms. Rebecca Richardson is currently serving on the L&R Committee. She assumed the position halfway through the term which expires in July. The AMC recommended Prentiss Searle to the L&R Committee

New Business

- Review Arizona Application for $3,600.
    - Motion was made to approve by Bob Murnane, seconded by Chris Guay, motion was Approved by unanimous vote to make payment of $3,600 to Arizona per the application.
- Review California Application for $3,000
    - Motion was made to approve by Mr. Chris Guay, seconded by Mr. Bob Murnane, motion was Approved by unanimous vote to make payment of $3,000 to California per the application
- Review New York State Application for $4,000.
    - Motion was made to approve by Mr. Chris Guay, seconded by Bob Murnane, motion was Approved by unanimous vote to make payment of $4,000 to New York per the application.
- Review of San Diego's amended application for reimbursement of additional shipping costs of $2,300 more than the originally approved $1,000.

- Motion was made by Richard Suiter to table consideration for the additional funds until the final total for the erroneous shipping charges are determined. This was seconded by Mr. Bob Wiese. Motion was passed to table consideration until a representative from the San Diego Weights and Measures can update the final amount needed to cover the shipping once the dispute has been resolved.

- Review of the Board of Directors request for $12,000 to help cover the expense to upgrade the Regional Point of Sale system to the NCWM standards.
  - Motion was made by Mr. Chris Guay to cover $1,500 per region, provided the Regional Meetings approve upgrading the systems. This was seconded by Mr. Bob Murnane. The motion was Approved by unanimous vote to contribute $1,500 to each region, $6,000 total, if the Regional Meetings approve the system upgrade.
- A total of $16,600 of new funding was approved, plus the $1,000 previously approved for San Diego for a total of $17,600.
- Remaining available AMC funds should be $4,003.28.
- Mr. Ron Gibson was nominated by Mr. Bob Murnane to take the AMC Secretary position in 2019. Mr. Gibson accepted.
- Mr. Bob Wiese accepted the AMC Vice Chair position for 2019.
- Mr. Mark Flint accepted the AMC Chair position for 2019.

Adjournment

- The meeting adjourned ~ 5:10 pm.

Next Meeting

No Discussion

Attendance

Name	Representing
David Calix	NCR
Don Onwiler	NCWM
Bob Weise	NWTank
Ron Gibson	Seraphin
Chris Guay	P&G
Bob Murnane	Seraphin
Don Newell	National Motor Freight Traffic Assoc.
Eric Janke	South Dakota W&M
Jason Smith	South Dakota W&M
Georgia Harris	NIST
Dale Neller	North American Miller Assoc.
Ken Ramsburg	MD W&M
Stephan Kirby	GM
Ann Boeckman	Kraft Heinz
Richard Suiter	Richard Suiter Associates

Brent Price	Gilbarco
Eric golden	Cardinal
Cary Ainesworth	Tufner Weight & Automation Systems
Jim Hewston	J.A. King
Russ Vires	Metler Toledo
Paul Lewis	Retired
Jim Pettinato	Technip FMC
Marc Butler	Emerson
David Sefcik	NIST
Mark Flint	ADM
Bill Callaway	Crompco

Appendix C

NCWM Charter Team Report

Team 2

January 2018

INTRODUCTION

The NCWM Charter Team is charged with proposing changes to the operation of the National Conference on Weights and Measures so that standards can be developed and published in a timelier manner. This report proposes two concepts for the future operation of the Conference. The first concept is making improvements and policy changes to the traditional annual meeting and voting cycle. The second concept is voting twice a year. Advances in technology, new products or services and, the need to rapidly publish regulations has generated a demand for speedier code development. The conference and its leadership are constantly striving to improve operations to meet the NCWM mission "To advance a healthy business and consumer climate through the development and implementation of uniform and equitable weights and measures standards using a consensus building process."

The first charter team, Team One, was launched in November 2015 and charged with examining the current processes of standards development, identifying stakeholders and their respective roles and to explore the operation of other standard setting organizations. They completed their work in July 2016 and presented a report that identified eight issue areas that require practical solutions. Those issue areas are shown on pages 8 and 9 of this report. Team One also proposed the Conference meet and vote twice a year instead of the traditional annual meeting and voting cycle.

A second charter team, Team Two, was launched in July 2017 to develop at least two concepts for consideration by the Board of Directors. The team was made up of some of the same members of the first team and others were added due to attrition. This team began by reviewing the report published in July 2017 and determined that they would propose solutions to the eight issue areas identified by Team One and review the twice a year meeting proposal.

CONCEPT 1 – IMPROVEMENTS AND POLICY CHANGES TO THE CURRENT MODEL

NCWM OPEN HEARING - PRESENTATIONS AND TESTIMONY

NCWM open hearings must be more structured and disciplined to promote effective and efficient consideration of the items before the Conference. This section addresses Conclusion 5 and 6, Report of Team Charter to the Chairman National Conference on Weights and Measures July 2016. (See pages 8 and 9 of this report)

Some presentations and testimony during the open hearings take a large amount of time. Committee chairs regularly approve technical presentations and provide time limits in advance of the open hearing. The presentations are valuable in explaining complex items and generate further testimony and questions. However, the presenters exceed their time limits. In other instances, testimony is extended because the same people come to the mic time after time to provide more information or to rebut a previous speaker. The lengthy hearings reduce the amount of time the committees have to work on their items during their work sessions. Often committees work late into the night and miss out on participating in other conference activities.

RECOMMENDATIONS

- Presentations given at NCWM open hearings be strictly limited to ten minutes <u>with no exceptions</u>. We suggest NCWM provide a timer so at least the presenter and committee chair would know how much time remains.

- Adopt a policy that limits the amount of time and the number of times a speaker can testify on an item during open hearings. The team recommends a limit of two trips to the mic during discussion of an item - once for initial testimony and once for a follow-up. An exception could be made, at the chair's discretion, for committee members to ask additional questions of a speaker.

- Members should be required to wait until all of those that rise to testify have spoken before they can return to the microphone for additional comments.

- Individuals giving presentations be required to submit their presentations at least 24 hours in advance of the hearing.

- Individuals proposing changes to language must be submitted to the committee in writing before the beginning of open hearings or before the committee work session.

DEVELOPING AND INFORMATIONAL ITEMS - TESTIMONY AND MANAGEMENT

The Committees at times take open testimony on developing and informational items during the hearings. There are occasions when time is spent hearing testimony or presentations on these items. This section addresses Report of Team Charter to the Chairman National Conference on Weights and Measures July 2016, Conclusions 5 and 6. (See pages 8 and 9 of this report)

RECOMMENDATIONS

- Developing and Informational items be limited to a report from the assigned subgroup and/or submitter as appropriate at the Interim and Annual. The presenter should be limited to 10 minutes <u>with no exceptions</u>.

- Developing and Informational items be reported on only by the assigned subgroup, submitter or submitter's representative at the regional meetings. Regional associations should consider limiting presentations to 15- minutes as a means of informing regional members and as preparation for those attending the NCWM meetings. Reports at the regionals may be filed in writing or heard through teleconference or web meeting.

- All meetings of the subgroups and items being worked be posted on the conference schedule and NCWM web site.

- Promote and encourage task group meetings at the regional conferences. NCWM should support the regionals with teleconferencing and web meetings to enable this activity.

- The NCWM Board of Directors develop an "Assigned" status for items. Items assigned could be managed under different time limits and process rules to promote rigorous discussion and well-developed items.

- Developing items not acted on by a task group or submitter for one full NCWM annual meeting cycle be withdrawn from the agenda.

PUBLICATION 15 and 16 FORMAT - GROUPING SIMILAR ITEMS

Currently items are placed in NCWM Publication 15 and 16 on the Specification and Tolerance Committee and the Laws and Regulation Committee agendas in a manner that aligns the items with the respective sections of the NIST Handbooks. This often separates items addressing similar or related topics and the items may be interdependent. Over the past few years the committees batched the items during the open hearings and voting sessions in an effort to effectively present the issues to the members and to make the hearing and voting process more efficient. The batching efforts are successful to some extent however members have a difficult time paging through the publications and keeping up with the testimony during the hearings and voting sessions. The Charter Team discussed grouping similar items in NCWM Publication 15 and 16 in a more logical manner and NEWMA successfully used a grouping scheme during their interim meeting with success.

The NCWM Board of Directors considered changing the format of NCWM Publication 15 and 16 to incorporate this recommendation and agreed to implement it on a trial basis for the 2018 edition of Publication 15. The board expects that there will be comments and suggestions to improve on the first version of this new format. This new format should also provide benefit to the regional associations as well as the NIST technical advisors.

The Charter Team recommends that NCWM consult with the five active committee members when formatting new proposals to determine whether they should be grouped. Submitters of new proposals may also recommend that their items be grouped.

ITEMS NOT PASSED DURING ANNUAL VOTING SESSION - ELIMINATION AND RECONSIDERATION

Currently voting items that are not passed during the annual meeting voting session are automatically returned to the committee for consideration. These items take time and effort to process.

The charter team concluded that there should be a policy that requires the item be dropped from the agenda with some exceptions. This section addresses Report of Team Charter to the Chairman National Conference on Weights and Measures July 2016, Conclusions 1 and 2. (See pages 8 and 9 of this report)

RECOMMENDATIONS

- Items that do not receive the required votes to pass or fail drop off the agenda at the conclusion of the meeting. However, the committee may choose to carry the item forward if a majority of the committee voted to carry the item forward. The committee would be required to make a decision on carrying the item forward within one week of the voting session and communicate their decision to the membership via NCWM. The committee would be made up of the same committee members that considered the item during the voting session. Comments would be added to the Background/Discussion section to report the decision and explain the rationale for carrying the item forward.

- Items carried forward after the annual voting session be limited to consideration for only one more year.

- Items not carried forward after a voting session may be resubmitted for consideration.

Note: These recommendations would require reconsideration if NCWM implements voting twice per year.

JOINT COMMITTEE SESSIONS - RESTRUCTURE AND REPUROSE

The Committee discussed the value of the Joint Committee Session held at the beginning of the Interim and Annual meetings. The session is intended to be a time to gather the standing committees, identify problems or special situations and make adjustments to help the committees do their work through the week. Over the past few years this session has become a quick check in and usually there is nothing to report or discuss.

The Charter Team recommended that this session be restructured to assist committee members by presenting some refresher training and proactively addressing problems or controversial issues. This section addresses Report of Team Charter to the Chairman National Conference on Weights and Measures July 2016, Conclusion 5. (See pages 8 and 9 of this report)

RECOMMENDATIONS

- The Charter Team recommends the session be restructured and the time used for a number of other value-added activities. For example, a quick refresher on committee process and policies, leadership and facilitation, discussion of batching items, or coordinating joint hearings. Immediate topics could include guidance on using the timer, limiting presentations and how to proceed once time expires.

- The Charter Team recommends that the Fall Committee Development sessions be continued to reflect changes to committee operations and to emphasize the leadership roles of the Chairpersons. The team also recommends expanding the meeting to include all committee members, not just new members and the chairs.

- Standing committees routinely conduct business prior to the Interim and Annual meetings. Using web based meetings, teleconferences and other electronic means to discuss and develop items in advance of the conferences. This will be a cultural shift for some members, will require technical assistance from NCWM and will require additional time commitments of committee members.

SUBGROUPS SUPPORTING THE WORK OF THE ORGANIZATION - CONTINIOUS IMPROVEMENT

Subgroups are increasingly valuable to the success of the conference as issues require more subject matter expertise, have significant regulatory and economic impact and may require several years to fully develop. The increasing use of subgroups enables the conference to tap industry and government expertise, intensely focus on fully developing issues and keep pace with changes in the marketplace. Subgroups increase membership and participation in the conference but also place an increasing burden on key leaders and NIST staff.

The charter team recommends the conference work diligently to continuously improve subgroup operations. This section addresses Report of Team Charter to the Chairman National Conference on Weights and Measures July 2016, Conclusions 4 and 7. (See pages 8 and 9 of this report)

RECOMMENDATIONS

- Each subgroup be given a charter to guide their work. The charter must include who the team reports to, clear expectations about deliverables, available resources, deadlines and a termination date.

- Subgroup members receive training on the policies, structure, reporting relationships, leadership and facilitation. (This is addressed in NCWM Policy 1.5.1.: Subgroups Supporting the Work of the Organization.)

- NCWM support subgroups by providing training, and making available conference calls, web meetings, and other electronic communications and document sharing.

REGIONAL STANDING COMMITTEES - ADDING MORE VALUE

The Charter Team recognized the importance of having strong, productive regional committees. The Regional organizations add value by both evaluating items and further developing the items. Subject matter experts and regulatory officials come together in an environment that enables greater in-depth discussions and thorough analysis of items.

Committees look at each item and recommend a status to the regional membership. The Regional Association then deliberates and approves the committee's recommendations of Informational, Developing, Voting or Withdrawn.

The other critical function of the committees is to further develop and refine items into a final product - usually Handbook language. The items then pass onto the other regions for more discussion, development and recommendations on the status for the item.

The Charter Team noted that there are the inconsistencies between the regions and the products they produce. Some of the observations of the charter team were:

- Some members are not familiar with the goals, purpose and responsibilities of the Regional Committees.

- Some members do not understand NCWM Committee, hearing and voting processes.

- Some members have not had a chance to develop the skills to chair and facilitate a Committee before being put in that role.

- The Committees may not have a subject matter expert or access to an expert to help make informed decisions and recommendations.

- Some Regional Committees continue to take testimony and change proposals during their work sessions.

- Some Regions are thorough and diligent in working items and others are less so.

- Some regional meetings are well attended by a wide range of regulatory and industry members while others aren't.

- In some cases, submitters of items do not attend the regional or send written testimony to the committees. In those instances, the committees do not have any new information to act on.

This section addresses Report of Team Charter to the Chairman National Conference on Weights and Measures July 2016, Conclusion 8. (See pages 8 and 9 of this report)

RECOMMENDATIONS

- Regional Committee members may benefit from training similar to the training provided NCWM Committee members.

- Regions may benefit from a Committee training and guideline publication similar to the one provided NCWM committee members. The Western Weights and Measures Association is updating the Committee Manual they use and is willing to make the manual available to the other associations.

- Regions may make it a priority to have committee members serve for several years, select members to get a committee with a wide range of expertise and include a member from the NCWM Standing Committee to provide continuity and background knowledge that would be useful to both the Regional and National Committees.

- Regional Committees could indicate in their committee reports when they do not have subject matter experts available to assist them in making a recommendation. In these instances, the region may simply take no position.

- New Proposals are normally submitted for the fall round of regional meetings. Presuming an Annual Meeting voting is retained, a deadline of September 1 or two weeks prior to the first regional meeting could be established that would apply to all four regions. This would place all four regions on an even footing to evaluate and make recommendations on the new proposals. Submitters of new proposals would have time from the end of the Interim Meeting to the established deadline date to fully prepare the new proposals. Regional committees, submitters, and NCWM standing committee members would then have sufficient time to review and prepare new proposals for the fall meetings.

- Individuals giving presentations could be required to submit their presentations at least 24 hours in advance of the hearing.

- Individuals proposing changes to language could be required to submit them to the Committee in writing before the beginning of open hearings or before the committee work session. This would allow regional committee chairs to better prepare for their open hearings and work sessions.

- Regional Standing Committees could be encouraged to follow the guidelines for presentations and open hearing comments used by the NCWM Standing Committees to facilitate the open hearing process.

PROPOSALS - FORM 15 DEVELOPMENT AND REGIONAL CONFERENCES

Form 15s are the first step in proposing changes to the handbooks and the process of amending the NIST Handbooks begins with consideration by the regional conferences. The Form 15s, known as proposals, come from a variety of sources. Some are submitted by long time members of the conference that have a sound understanding of the process; others are submitted by businesses and regulatory officials new to the conference with little knowledge of the process. The proposals are sometimes very well developed with supporting data, detailed amendments for the affected Handbook sections and, sometimes demonstrate collaboration with other stakeholders. Proposals are generally submitted in a timely manner however some are late, and some are sent directly to regional committee chairs. Because the regions meet in different months the proposal may not be considered by one or more of the regions and in some cases not evaluated by key stakeholders. The Charter Team recommends the conference take measures to improve the quality and timely submission of Form 15s.

RECOMMENDATIONS

- Develop minimum criteria that each form 15 meet before it can be forwarded to the regional conferences for consideration. The criteria could be in the form of a checklist and should include a description of the regulatory issue, technical details and supporting data, proposed Handbook language, a discussion of economic impact or a cost/benefit analysis, a list of affected stakeholders or industries and a summary of the stakeholder responses to the proposed change.

- Form 15s must be received by September 1 of each year with exceptions being granted only for emergency proposals in accordance with existing NCWM policy.

- Form 15s must be heard by the regional conferences and must receive at least one recommendation that the item be given Voting, Developmental, Assigned or, Informational status before it can be considered by the NCWM Standing Committee.

- Encourage, support and, expect committees to begin their work well before the conferences.

COMMITTEE REPORTS - CONCISE SUMMARIES AND RATIONALE

Well written and well-structured committee reports are essential to excellent standards development. Initially the members use the reports to help them determine how to vote, testify and in some instances offer changes. Members read the reports to understand the fundamental issue, gain insights about the stakeholder positions and understand how opposing views were resolved. After the standard is published in the handbook the reports serve to document the intent and discussions and are used by jurisdictions to determine how to apply the standards. The National Committee Reports can be lengthy and difficult to follow. The Regional Committee Reports can be superficial rather than a comprehensive summary of discussions, data analysis and, rationale for their recommendations. The Charter Team recognizes that time constraints at the meetings, both regional and national, put a great deal of pressure on committee members to meet deadlines at the cost of quality. The first three recommendations below apply to both Regional and National Committees.

RECOMMENDATIONS

- Develop aids or checklists to guide committee members in writing the reports. Some of the items to address in a checklist are:

  - Identification of the regulators, stakeholders, subgroups, NIST or other federal agencies involved in the issue.
  - Identification of all sections of the Handbooks affected by the changes
  - Identification of any federal statutes or regulations affected by the changes
  - Discussion of the conflicting positions and resolutions.

- Recommendation to submit the item to a subgroup and reasons to form a subgroup.
- Recommendation to return the item to the submitter for development

- Provide support to committees in the form of web meetings, conference calls and other logistic support.

- Consider appointing a secretary to take notes, draft addendums and do a first draft of the committee reports. The secretary should not be a standing committee member or NIST technical advisor, nor should they have a vested interest in the proposals being considered by the committee.

- Require an update be provided to the regional committees by NCWM subgroups prior to or at each regional meeting.

- Assemble a team to redesign and reformat the committee reports. The team should identify the key elements of a report, develop a format that summarizes the current proposal, so the reader can quickly understand the issue they will be voting on and that provides a history and background of the item's development.

- Host a NIST/NCWM workgroup to discuss roles and responsibilities regarding standards development and publication of reports. Clarify these roles and responsibilities for both national and regional organizations.

CONCEPT 2 - TWICE A YEAR VOTING

CHANGE MEETING PROCESSES - VOTE AT BOTH SUMMER AND WINTER MEETINGS

NCWM's traditional Annual and Interim Meetings would require process changes to implement a twice a year voting system. The meetings are addressed as a Summer Meeting and a Winter Meeting below. Voting would take place during each session and require attendance in person. The Winter meeting would be extended by one day to accommodate the hearings, committee meetings and voting sessions.

RECOMMENDATIONS

The 2016 Charter Team proposed the following sequence for the NCWM and Regional meetings and outlined the activities and actions for each. The 2017 Charter Team made some editorial changes to their recommendations.

- Summer Meeting Committees will hold open hearings.
  - Committees develop addendum sheets.
  - Addendum sheets will include a list of all items designated for carryover and the status they will have in Pub 15. This will include Voting status items for the Winter Meeting.
  - Items will be voted on by the membership.
  - Within one week of the end of the Summer Meeting voting session, the committees will assess the status of any items that had been returned to committee in the Summer Meeting voting session and assign a status.
  - New Committee members would begin their terms upon completion of item e above.

- SWMA and WWMA meet in the Fall
  - Provide comment on all carryover items.
  - Receive and make recommendations for status on all new proposals.

- NCWM will create Pub 15

    - All carryover items will have the status assigned by the NCWM standing committee following the Summer Meeting.

    - All new items will be presented in Pub 15 without status. These items will be discussed and assigned a status by the NCWM standing committees in the addendum sheets at the Winter Meeting.

- Winter Meeting Process. This process will be similar to the Summer Meeting. It will include a voting session and the meeting will be extended by one day. Following is the process.

    - Committees will hold open hearings.

    - Committees develop addendum sheets.

    - Addendum sheets will include a list of all items designated for carryover and the status they will have in Pub 16. This will include Voting status items for the Summer Meeting.

    - Items will be voted on by the membership.

    - Within one week of the end of the Winter Meeting voting session, the committees will assess the status of any items that had been returned to committee in the Winter Meeting voting session and assign a status.

- CWMA and NEWMA meet in the spring.

    - Provide comment on all carryover items.

    - Receive and make recommendations for status on all new proposals.

- NCWM creates Pub 16.

    - All carryover items will have the status assigned by the NCWM standing committee following the Winter Meeting.

    - All new items will be presented in Pub 16 without status. These items will be discussed and be assigned a status by the NCWM standing committees in the addendum sheets at the Summer Meeting.

AMEND BYLAWS AND POLICIES TO IMPLEMENT TWICE A YEAR VOTING

The NCWM bylaws and policies must be changed to implement twice a year voting; the articles of incorporation would not need to be changed. Most of the changes would be to rename the Interim and Annual Meetings. Changes to bylaws require a vote of the membership and changes to policies are made by the Board of Directors.

RECOMMENDATIONS

Change the bylaws and policies listed below to implement twice a year voting.

Bylaws:

- Article IV
    - Section 3 - Waiver of Registration and Membership Fees
- Article VI
    - Section 2 - Directors Eligibility, Part B.
    - Section 3 - Nominations and Elections, Parts A. B, C, D

        - Section 5 - Removal of Directors
        - Section 6 - Appointive Officials, Part B.
    - Article VII
        - Section 10 - Sergeants-at-Arms
    - Article VIII
        - Section 1 - Annual Meeting
        - Section 2 - Meetings
        - Section 3 - Special Meetings, Part B.
    - Article IX
        - Section 5
            - Part C, 3. Conference Training Topics
            - Part D. Nominating Committee
    - Article X - Voting System
        - Section 1
            - Part A. Official Designation
            - Part B. Composition
            - Part C, Method of Designation
        - Section 2, House of Delegates
        - Section 3, House of General Membership
        - Section 5 - Voting Rules, Part B.
        - Section 9.A. Part C (statement above chart)
    - Article XI - Amendments

<u>Policies:</u>

- 2.1.1. Observer Fees
- 2.1.3. One-Day Registration Fee
- 2.1.4. Waived Registration Fee for Guest Speakers
- 2.1.5. Student Registration
- 2.3.1. Hospitality Suites
- 2.3.2. Event Sponsorship
- 2.3.3. NCWM Meeting Space
- 2.4.1. Committee Work Session Protocol
- 2.4.2. Training Session Topics
- 2.4.3. Retired Member Voting Privileges
- 2.4.4. Committee Work Schedules
- 2.4.5. Written Testimony

- 2.4.7. Recording Meetings 2.4.8. Transparency in Representation
- 2.6.2. Special Awards Subcommittee

CHANGE PUBLICATION, ADMINISTRATIVE, FINANCIAL AND OTHER PRACTICES

Adopting a twice a year voting cycle would require changes to other parts of NCWM and NIST operations. Following are a list of questions raised by Charter Team One and in some instances Charter Team Two responded with their recommendations.

QUESTIONS AND RECOMMENDATIONS

1. Would standards be printed twice per year or remain on an annual cycle?

   Charter Team Two recommends remaining with one printing per year. States adopt the NIST standards in various ways; some adopt by reference; some adopt through administrative rulemaking and others write the handbook provisions into administrative rules.

2. What constitutes the long-standing NCWM Annual Reports?

3. Would we have an outing at the Winter Meeting?

4. NCWM offers to pay committee travel to the Interim Meeting, but not the Annual. Would we offer to pay for both? Or the expenses for each? Or continue paying for just the Winter Meeting?

   Charter Team Two recommends that NCWM consider options for continuing support of Committee Member travel. **NOTE:** NCWM does not presently recoup these costs through registration fees.

5. In any case, there would be an increase in Winter Meeting registration fees to cover;

   - Added day of audiovisual fees.
   - Added day of light breakfast.
   - Added day of staff travel.
   - Added printing costs for addendum sheets.

6. Annual Business Meeting: Will this still be held just at the Summer Meeting?

7. Special Awards: Would these remain just at the Summer Meetings?

<u>CONCLUSIONS OF THE CHARTER TEAM REPORT OF JULY 2016</u>

1. Standing Committee Agendas include too many items. In recent years, agendas have overwhelmed committee members. Committee work sessions have become all- consuming and diminish the committee's final work product. Late nighttime commitments affect committee members' morale and cause difficulties in recruiting new committee members. The existing agenda item designation system only provides guidance to the committees as it relates to the status of an item.

2. Items remain on committee agendas for indefinite periods of time. Clearly there are agenda items that need extensive development but ***revisiting and/or voting*** on the same items on a yearly basis raises frustration and causes interested groups to question the credibility of the Conference. Interested parties have bypassed the NCWM process and have reached out to the Federal and State Governments for favorable legislation. Some states have passed "boutique legislation" to address that state's immediate need.

3. Adoption or non-adoption of agenda items by the Conference as a whole occurs just once a year. Items that are ready for a vote or have been voted on and are ready for a revote cannot be revisited until the July Annual Meeting. Voting only once a year inherently slows the approval process.

4. Agenda items can be intensely technical and inconsistent technical knowledge of a specific item by committee members can hinder the study of the item. Committees may not have the expertise or time to develop items, and proposal authors may not have the resources or connections to reach out to affected parties except at national meetings. The result is that items of a technical nature may not be developed adequately before reaching the committee and may return year after year without significant change because of a continuing lack of resources for development.

5. Committee Chairpersons have broad authority and control over their agendas. The tools provided to committee chairs are explained in detail during the NCWM Committee Orientation process, but we believe committee chairs do not use these tools enough in reviewing agenda content. Also, emphasis should be placed on the most efficient utilization of time outside of the NCWM meeting timeframes to work on agenda items.

6. Comments during open hearings and the voting process at times are not directed to the committees and their chairpersons, inviting "back and forth" discussions on agenda items. Although comments are strongly encouraged, "back and forth" discussions can cause unnecessary delays and can diminish the time necessary to consider "last minute" changes. As a result, an item deemed by the Committee ready for a vote may be quickly "pulled back" increasing the time it remains on an agenda.

7. Subcommittees perform an important function by advising and assisting the standing committees on agenda specific topics. A subcommittee's recommendation and work product become an integral part of an agenda item. Subcommittee members are subject matter experts, whose expertise and background should be fully utilized by standing Committees.

8. Every proposal/agenda item presented to a regional association and/or to NCWM is distinct and raises a corresponding level of interest. Determining "how long" an item takes to move through the NCWM process is difficult and is driven by the uniqueness (technical nature and the widespread effect on the marketplace) of agenda items. Data suggests that most items move relatively smoothly through the conference approval process, but that suggestion is clearly diminished by the uniqueness of an item.

   NCWM members representing different interests have raised concerns that NCWM will not be able rise to the challenges it will confront in the 21st Century. Finding solutions to the concerns identified above will greatly assist the conference in meeting those challenges.

Charter Team Two Committee Members
Mr. Jerry Buendel, Washington | Chairman & Western Representative
Mr. Harold Prince, Florida | Southern Representative
Mr. Louis Sakin, Towns of Hopkinton/Northbridge | Northeastern Representative
Mr. Robert DeRubeis, Michigan | Central Representative
Mr. Eric Golden, Cardinal Scale Manufacturing | Associate Membership
Mr. Robert Upright, Vishay Transducers | Associate Membership
Mr. Don Onwiler, NCWM
Dr. Doug Olson, NIST/OWM

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Laws and Regulations (L&R) Committee 2018 Final Report

Mr. Ethan Bogren, Committee Chair
Westchester County, New York

INTRODUCTION

This is the report of the Laws and Regulations Committee (hereinafter referred to as the "Committee") for the 103rd Annual Meeting of the National Conference on Weights and Measures (NCWM). This report is based on the Interim Report offered in the NCWM Publication 16, "Committee Reports," testimony at public hearings, comments received from the regional weights and measures associations and other parties, the addendum sheets issued at the Annual Meeting, and actions taken by membership at the voting session of the Annual Meeting. The voting items shown below were adopted as presented when this report was approved. This report contains those recommendations to amend National Institute of Standards and Technology (NIST) Handbook 130 (2018), "Uniform Laws and Regulations in the Areas of Legal Metrology and Engine Fuel Quality," or NIST Handbook 133 (2018), "Checking the Net Contents of Packaged Goods."

Table A identifies the agenda and appendix items by reference key, title of item, page number and the appendices by appendix designations. The acronyms for organizations and technical terms used throughout the agenda are identified in Table B. The first four digits of the Reference Key Numbers of the items are assigned from the Subject Series List. The status of each item contained in the report is designated as one of the following: **(D) Developing Item:** the Committee determined the item has merit; however, the item was returned to the submitter or other designated party for further development before any action can be taken at the national level; **(I) Informational Item:** the item is under consideration by the Committee but not proposed for Voting; **(V) Voting Item:** the Committee is making recommendations requiring a vote by the active members of NCWM; **(W) Withdrawn Item:** the item has been removed from consideration by the Committee.

Table C provides a summary of the results of the voting on the Committee's items and the report in its entirety. Some Voting Items are considered individually; others may be grouped in a consent calendar. Consent calendar items are Voting Items that the Committee has assembled as a single Voting Item during their deliberation after the Open Hearings on the assumption that the items are without opposition and will not require discussion. The Voting Items that have been grouped into consent calendar items will be listed on the addendum sheets. Prior to adoption of the consent calendar, the Committee entertains any requests from the floor to remove specific items from the consent calendar to be discussed and voted upon individually.

Proposed revisions to the handbook(s) are shown as follows: 1) deleted language is indicated with a **bold face font using strikeouts** (e.g., ~~**this report**~~), and 2) proposed new language is indicated with an **underscore bold faced font** (e.g., **new items**). When used in this report the term "weight" means "mass."

Note: It is the policy of NIST to use the International System of Units (SI) (the metric system) in publications; however, recommendations received by NCWM technical committees and regional weights and measures associations have been printed in this publication as submitted. Therefore, this report may contain references to units of the U.S Customary System of Measurement.

Subject Series List

Table A
Table of Contents

Appendices

Table B
Glossary of Acronyms and Terms

Acronym	Term	Acronym	Term
ASTM	ASTM International	NIST	National Institute of Standards and Technology
CFR	Code of Federal Regulations	OWM	Office of Weights and Measures
CNG	Compressed Natural Gas	PALS	Packaging and Labeling Subcommittee
CWMA	Central Weights and Measures Association	S&T	Specifications and Tolerances
FALS	Fuels and Lubricants Subcommittee	SWMA	Southern Weights and Measures
L&R	Laws and Regulations	UPLR	Uniform Packaging and Labeling Regulation
LNG	Liquefied Natural Gas	USNWG	U.S. National Work Group
NCWM	National Conference on Weights and Measures	WWMA	Western Weights and Measures Association
NEWMA	Northeastern Weights and Measures Association		

Table C
Voting Results

Reference Key Number	*House of State Representatives*		*House of Delegates*		*Results*
	Yeas	*Nays*	*Yeas*	*Nays*	
Consent Calendar					
B1: PAL-1	40	0	55	1	Adopted
B1: NET-1					Adopted
B3: MOS-4					Adopted
B3: FLR-5					Adopted
PAL-2					Adopted
MOS-10					Adopted
NET-5					Adopted
FLR-9	39	1	48	8	Adopted
MOS-7	25	14	36	16	Returned to Committee
MOS-8	40	0	54	2	Adopted
To Accept the Report	Voice Vote				Adopted

Details of All Items
(In order by Reference Key)

ITEM BLOCK 1 (B1) PESTICIDE LABELING

(This block was Adopted)

B1: PAL-1 VC		Sections 6.12. Supplementary Quantity Declarations, 6.14. Qualification of Declaration Prohibited, and 12. Variations to be Allowed.
B2: NET-1 VC		Sections 1.2.2. Average Requirement, 1.4. Other Regulatory Agencies Responsible for Package Regulations and Applicable Requirements, 2.3.7.2. Average Requirement, and Appendix A. Tables – Table 1-1 "Agencies Responsible for Package Regulations and Applicable Requirements

Source:
NIST OWM (2018)

Purpose:
To notify the reader of an existing conflict between NIST Handbook 130, Uniform Packaging and Labeling Regulations (UPLR) and U.S. Environmental Protection Agency (EPA) regulations within 40 CFR 156.10(d), which supersedes state and local regulations. Products subject to the EPA control are not covered by the Fair Packaging and Labeling Act (FPLA) and as a result, EPA regulations related to labeling and net quantity often differ from those of the Federal Trade Commission (FTC) and the Food and Drug Administration (FDA) under Fair Packaging and Labeling Act (FPLA).

B1: PAL-1 VC Sections 6.12. Supplementary Quantity Declarations, 6.14. Qualification of Declaration Prohibited, and 12. Variations to be Allowed.

Item under Consideration:
Amend NIST Handbook 130 Uniform Regulation for the Uniform Packaging and Labeling Regulation as follows:

6.12. Supplementary Quantity Declarations. – The required quantity declaration may be supplemented by one or more declarations of weight, measure, or count, such declaration appearing other than on a principal display panel. Such supplemental statement of quantity of contents shall not include any term qualifying a unit of weight, measure, or count that tends to exaggerate the amount of commodity contained in the package (e.g., "giant quart, "larger" liter, "full" gallon, "when packed," "minimum, (***NOTE X*, page X**)" or words of similar import).

6.14. Qualification of Declaration Prohibited. –In no case shall any declaration of quantity be qualified by the addition of the words "when packed," "minimum, (***NOTE X*, page X**)", or "not less than or any words of similar import (e.g., "approximately"), nor shall any unit of weight, measure, or count be qualified by any term (such as "jumbo "giant," "full," or the like) that tends to exaggerate the amount of commodity.

NOTE X: Packages of products subject to the labeling requirements under the EPA, Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) under 40 CFR 156.10 are permitted to display the term "minimum" in conjunction with the net quantity of contents declaration. The packer may choose to fill the packages under the minimum or average systems of fill. However, if the minimum system is declared, variations above minimum quantity is permissible only to the extent that it represents deviation unavoidable in good manufacturing practice and no variation below the stated minimum quantity is permitted.

(Note Added 2018)

Section 12. Variations to be Allowed

12.1. Packaging Variations.<u>(*NOTE X*, page X)</u>

12.1.1. Variations from Declared Net Quantity – Variations from the declared net weight, measure, or count shall be permitted when caused by unavoidable deviations in weighing, measuring, or counting the contents of individual packages that occur in current good manufacturing practice, but such variations shall not be permitted to such extent that the average of the quantities in the packages of a particular commodity or a lot of the commodity that is kept, offered, or exposed for sale, or sold is below the quantity stated, and no unreasonable shortage in any package shall be permitted even though overages in other packages in the same shipment, delivery, or lot compensate for such shortage. Variations above the declared quantity shall not be unreasonably large.

12.1.2. Variations Resulting from Exposure. – Variations from the declared weight or measure shall be permitted when caused by ordinary and customary exposure to conditions that normally occur in good distribution practice and that unavoidably result in change of weight or measure, but only after the commodity is introduced into intrastate commerce, provided the phrase "introduced into intrastate commerce" as used in this paragraph shall be construed to define the time and the place at which the first sale and delivery of a package is made within the state, the delivery being either:

(a) directly to the purchaser or to his/her agent; or

(b) to a common carrier for shipment to the purchaser,

and this paragraph shall be construed as requiring that so long as a shipment, delivery, or lot of packages of a particular commodity remains in the possession or under the control of the packager or the person who introduces the package into intrastate commerce, exposure variations shall not be permitted.

12.2. Magnitude of Permitted Variations. <u>(*NOTE X*, page X)</u> – The magnitude of package variations of this regulation permitted under Sections 12. Variations to be Allowed, 12.1. Package Variations, 12.1.1. Variations from Declared Net Quantity, and 12.1.2. Variations Resulting from Exposure shall be those expressly set forth in this regulation and variations such as those contained in the procedures and tables of the latest version of NIST Handbook 133, "Checking the Net Contents of Packaged Goods."

B1: NET-1 VC Sections 1.2.2. Average Requirement, 1.4. Other Regulatory Agencies Responsible for Package Regulations and Applicable Requirements, 2.3.7.2. Average Requirement, and Appendix A. Tables – Table 1-1 "Agencies Responsible for Package Regulations and Applicable Requirements

Item under Consideration:
Amend the Handbook 133 as follows:

Add a note to Section 1.2.2. Average Requirement:

1.2.2. Average Requirement

In general, the average net quantity of contents of packages in a lot must at least equal the net quantity of contents declared on the label. Plus or minus variations from the declared net weight, measure, or count are permitted when they are caused by unavoidable variations in weighing, measuring, or counting the contents of individual packages that occur in current good manufacturing practice. Such variations must not be permitted to the extent that the average of the quantities in the packages of a particular commodity or a lot of the commodity that is kept, offered, exposed for sale, or sold, is below the stated quantity. (See Section 3.6. "Pressed and Blown Glass Tumblers and Stemware" and Section 4.2.1. "Packages Labeled with 50 Items or Fewer" for exceptions to this requirement.) <u>**(See also Section 1.4.1. Special Net Quantity of Contents Requirements for Pesticides Labeled with a "Minimum" Net Quantity of Contents Declarations.)**</u>

(Amended 2018)

Add a new sub-section under Section 1.4. "Other Regulatory Agencies Responsible for Package Regulations and Applicable Requirements.":

1.4.1. Net Quantity of Contents Requirements for Pesticides Labeled with Minimum Net Quantity of Contents Declarations.

The Environmental Protection Agency (EPA) permits packers of pesticides the option of declaring the net quantity of contents using either the average or the minimum package fill systems. If the manufacturer uses the minimum system, the term "minimum" must appear adjacent to the quantity declaration. If the packer uses the average system, the procedures in Section 2.3.7. Evaluate for Compliance are used to determine compliance. Use the procedures in Section 2.3. "Basic Test Procedure for Gravimetric Testing of Net Weight" to select and test a sample and use the following compliance procedure to determine if the sample passes or fails the minimum package fill requirements.

Compliance Requirements for Packaged Pesticides (e.g., antimicrobial wipes, insect repellent wipes, towelettes, liquid or dry products)

1. **The net weight or measure of quantity shall be exclusive of wrappers or other materials and shall be the average quantity unless there is an explicit statement on the Principal Display Panel (PDP) in conjunction with the quantity declaration that the package was filled under the minimum system of fill [e.g., "minimum weight 500 g (1 lb 1 oz).]**

2. **A Maximum Allowable Variation (MAV) is not applied.**

3. **Variation above minimum content is permissible only to the extent that it represents deviation unavoidable in good manufacturing practice.**

4. **Variation below the declared minimum quantity is NOT permitted.**

5. **Compliance Procedure and Requirements**

   a. **After the samples are tested the individual package errors are determined. The average error is not calculated.**

   b. **Review the individual package errors:**

      - **If a minus package error is found the sample fails.**

      - **If no minus package errors are found the sample passes (e.g., the errors are 0 or plus)**

(Added 2018)

Add a note to Section 2.3.7.2. Average Requirement:

2.3.7.2. Average Requirement

1. Determine the average error by dividing the total error recorded in Box 15 by the sample size recorded in Box 6. Record the average error in Box 18 if using dimensionless units or in Box 19 if using units of weight.

2. Compute the average error in terms of weight (if working in dimensionless units up to this time) by multiplying the average error in dimensionless units by the unit of measure and record the value in Box 19. If the average error is positive, the sample passes the average requirement. If the average error is negative, the sample fails under a "Category B" test. Record in Box 20.

Note: If the total error recorded in Box 15 is a plus value, and Box 17 is "No," (the number of unreasonable errors is equal to or less than the number allowed, recorded in Box 8), the lot passes.

(Refer to Section 1.4.1. Special Net Quantity of Contents Compliance Requirements for Pesticides Labeled with a "Minimum" Net Quantity of Contents Declarations.)

(Amended 2018)

Add the following note to the responsible agency "EPA" within Table 1-1 "Agencies Responsible for Package Regulations and Applicable Requirements":

Table 1-1. Agencies Responsible for Package Regulations and Applicable Requirements

Commodity	Responsible Agency	NIST Handbook 133 Sampling Plans	Table of Maximum Allowable Variations
Pesticides **(Refer to Section 1.4.1. Special Net Quantity of Contents Compliance Requirements for Pesticides Labeled with a "Minimum" Net Quantity of Contents Declarations.)**	**U.S. Environmental Protection Agency and State and local weights and measures.** **www.epa.gov/**	**Use Table 2-1.** Sampling Plans for Category A to test packages at all locations.	**Table 2-5.** MAVs for Packages Labeled by Weight **Table 2-6**. MAVs for Packages Labeled by Liquid or Dry Volume **Table 2-7.** MAVs for Packages Labeled by Count **Table 2-8.** MAVs for Packages Labeled by Length (Width) or Area **Table 2-10.** Exceptions to the MAVs for Textiles, Polyethylene Sheeting and Film, Mulch and Soil Labeled by Volume, Packaged Firewood Labeled in Terms of Volume, and Packages Labeled by Count with 50 Items or Fewer, and Specific Agriculture Seeds Labeled by Count

(Amended 2018)

Background/Discussion:

(This item appeared on the 2017 Fall regional reports as Item 2301-1 and 2600-1. These items appear on the 2018 NCWM Interim and Annual Reports as Item Block 1 (B1), B1: PAL-1 and NET-1.)

Products subject to the EPA control are not covered by the Fair Packaging and Labeling Act (FPLA) and as a result some EPA regulations differ from those adopted by the Federal Trade Commission (FTC) and the Food and Drug Administration (FDA) under the Fair Packaging and Labeling Act (FPLA). Within the UPLR Sections 6.12. Supplementary Quantity Declaration and 6.14. Qualification of Declaration Prohibited prohibits the use of the term "minimum" in conjunction with declarations of net quantity of contents. In addition, under Section 12. Variations to be Allowed, the "minimum system" of fill is not recognized.

The OWM is proposing that a footnote be added to the NIST Handbook 133 explaining the difference and to inform readers that EPA regulations in 40 CFR 156.10(d) permit the use of the term "minimum weight" in conjunction with declarations of the net quantity of contents. In addition, the minimum system of fill requirements apply when the packer uses the term "minimum weight."

This information will clarify UPLR prohibitions on the use of the term "minimum" should not be applied to pesticides and other products subject to EPA regulations (these must bear an EPA registration number). This should ensure that enforcement action not be taken in accordance with the UPLR requirements. In addition, adding this to the UPLR will provide guidance on the application of fill requirements under a minimum system of fill.

OWM does not anticipate any opposition to this due to the amendments in the proposal are to inform users of the existing conflict between the UPLR and EPA labeling regulations

EPA Registration Number Required to Appear on Package

Minimum weight statement

At the 2018 Interim Meeting, Mr. Kurt Floren (Los Angeles County) suggest that examples provided in this item should include a reference to liquid and dried pesticide products (in addition to wipes and towelettes). The Committee reviewed the information and modified the language to include additional examples.

Under Section 6.12. changes to the *Note X*:

> ***NOTE X: Packages of ~~pesticides~~ products subject to the labeling ~~regulations~~ requirements of the ~~Environmental Protection Agency~~ EPA Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) under 40 CFR 156.10.~~d.~~ are permitted to display the term "minimum" in conjunction with the net quantity of contents declaration. The packer may choose to fill the packages under the minimum or average systems of fill. However, if the minimum system is declared, variations above minimum quantity is permissible only to the extent that it represents deviation unavoidable in good manufacturing practice and no variation below the stated minimum quantity is permitted.***
>
> **(Added 20XX)**

Under Section 1.4. Other Regulatory Agencies Responsible for Package Regulations and Applicable Requirements.:

> **1.4.1. Net Quantity of Contents Requirements for Pesticides Labeled with Minimum Net Quantity of Contents Declarations.**
>
> **The Environmental Protection Agency (EPA) permits packers of pesticides the option of declaring the net quantity of contents using either the average or the minimum package fill systems. If the manufacturer uses the minimum system, the term "minimum" must appear adjacent to the quantity declaration. If the packer uses the average system, the procedures in Section 2.3.7. Evaluate for Compliance are used to determine compliance. Use the procedures in Section 2.3. "Basic Test Procedure for Gravimetric Testing of Net Weight" to select and test a sample and use the following compliance procedure to determine if the sample passes or fails the minimum package fill requirements.**
>
> **Compliance Requirements for Packaged Pesticides (e.g., antimicrobial wipes, insect repellent wipes, ~~and~~ towelettes, liquid or dry products)**

With acceptance of these changes the Committee recommends this as a blocked Voting item.

At the 2018 NCWM Annual Meeting there were no comments heard on this item.

Regional Association Comments:

At the 2017 WWMA Annual Meeting, Ms. Lisa Warfield (NIST Technical Advisor) commented that Items 2301-1 & 2600-1 are intended to harmonize EPA requirements that were previously unknown within NIST Handbook 130. Ms. Warfield commented the EPA Labeling Manual is located on the NCWM supporting document website. Mr. Chris Guay (Procter & Gamble), commented this is a complete surprise and is related to FIFRA (Federal Insecticide Fungicide and Rodenticide Act). Mr. Guay remarked Procter and Gamble has products that fall under this requirement. He believes most large companies would not change procedures because the requirements for FPLA are more stringent. Mr. Guay is supportive of this item and the companion NIST Handbook 133 test procedure moving forward as a Voting item. NIST has been in contact with the EPA to alert them of differences in the regulations. The Committee believes this item is ready for Voting status.

At the 2017 SWMA Annual Meeting, Ms. Warfield gave an overview of Items 2301-1 & 2600-1 pointing out existing conflict with the EPA labeling regulations and NIST Handbook 130 labeling of pesticides and antibacterial products registered under EPA. EPA regulated products are not covered under the FPLA. This proposal modifies the UPLR alerting users that the term "minimum: is allowed for EPA registered products. In addition, allowing for a minimum fill differs from NIST Handbook 133 Requirements. New item 8 is a NIST Handbook 130 companion item that provides guidance for products labeled with the term "minimum." Guidance for the EPA labeling is located under the NCWM Interim 2018 meeting documents. The SWMA recommends this as a Voting item.

At the 2017 CWMA Interim Meeting, the Committee seeks to clarify this proposal only applies to products covered by FIFRA, and not all EPA products. CWMA recommends this be a Voting item. At the 2018 CWMA Annual Meeting, Ms. Warfield commented that EPA allows the term minimum on pesticide labeling. This proposal will update NIST Handbook 130 labeling requirements and provide testing procedures for NIST Handbook 133. CWMA believes the items are fully developed.

At the 2017 NEWMA Interim Meeting, Mr. Guay commented that the term "pesticide" in *NOTE X* is not appropriate and recommends that the language from the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) be used rather than EPA labeling regulations, which is too broad. Several state regulators agreed with Mr. Guays remark. NEWMA modified this language and recommends this language move forward as a Voting item.

> ***NOTE X: Packages of ~~pesticides~~ products subject to the labeling ~~regulations~~ requirements under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), administered by ~~of~~ the United States Environmental Protection Agency ~~under~~ (40 CFR 156.10.d.) are permitted to display the term "minimum" in conjunction with the net quantity of contents declaration. The packer may choose to fill the packages under the minimum or average systems of fill. However, if the minimum system is declared, variations above minimum quantity is permissible only to the extent that it represents deviation unavoidable in good manufacturing practice and no variation below the stated minimum quantity is permitted.***
>
> **(Added 20XX)**

At the 2018 NEWMA Annual Meeting no comments were heard, and they recommend this as a Voting item.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to **www.ncwm.net/meetings/annual/publication-16** to review these documents.

ITEM BLOCK 2 (B2) KEROSENE, LPG, AND FUELS, LUBRICANTS AND AUTOMOTIVE PRODUCTS, CNG, LNG AND DEF

NOTE: This blocked item is how the language appeared in Publication 16 (2018). With the adoption of FLR-9 on this agenda, some of the language within the block is as changed.

B1: MOS-1	A	Section 2.19. Kerosene (Kerosine).
B1: FLR-1	A	Section 3.7. Kerosene (Kerosine).
B1: MOS-2	A	Section 2.21. Liquefied Petroleum Gas.
B1: FLR-2	A	Section 3.10. Liquefied Petroleum Gas.
B1: MOS-3	A	Sections 2.20. Automotive Gasoline and Automotive Gasoline Oxygenate Blends, 2.XX. Diesel Fuel., 2.XX. Aviation Turbine Fuels, 2.XX., Aviation Gasoline, 2.XX. Fuel Oils, 2.XX. M85 Fuel Methanol
B1: FLR-3	A	Section 3. Classification and Method of Sale of Petroleum Products
B1: FLR-4	A	Sections 1.12. Compressed Natural Gas (CNG), 1.14. Diesel Exhaust Fluid (DEF), 1.26. Gasoline Gallon Equivalent (GGE), 1.XX. Diesel Gallon Equivalent (DGE), and 1.36. Liquefied Natural Gas Equivalent (LNG)

Source:
Archer Daniels Midland Corporation (2018)

B2: MOS-1 A Section 2.19. Kerosene (Kerosine).

Purpose:
This proposal is to harmonize the method of sale for kerosene between NIST Handbook 130, Uniform Regulation for the Method of Sale of Commodities and the Uniform Engine Fuels and Automotive Lubricants Regulation.

Item under Consideration:
Amend NIST Handbook 130, Uniform Method of Sale of Commodities Regulation as follows:

2.19. Kerosene (Kerosine). ~~All kerosene kept, offered, exposed for sale, or sold shall be identified as such and will include, with the word kerosene, an indication of its compliance with the latest version of the standard specification ASTM Standard D3699, "Standard Specification for Kerosine."~~

2.19.1. ~~Retail Sale from Bulk.~~ Standard Specification - All kerosene kept, offered, exposed for sale, or sold shall be identified as such and will include, with the word kerosene, an indication of its compliance with the latest version of ASTM Standard D3699, "Standard Specification for Kerosine."

2.19.2. Labeling of Grade Required. – Kerosene shall be identified by the grades No. 1 K or No. 2 K.

Example:
1K Kerosene; Kerosene - 2K.

2.19.3. Additional Labeling Requirements. – Each retail dispenser of kerosene shall be labeled as 1 K Kerosene or 2 K. In addition, No. 2 K dispensers shall display the following legend:

"Warning - Not Suitable For Use In Unvented Heaters Requiring No. 1 K."

The lettering of this legend shall not be less than 12.7 mm (½ in) in height by 1.5 mm ($^{1}/_{16}$ in) stroke; block style letters and the color of lettering shall be in definite contrast to the background color to which it is applied.

(Added 20XX)

2.19.4. Retail Sale from Bulk. – All kerosene kept, offered, or exposed for sale and sold from bulk at retail shall be in terms of the gallon or liter.

(Added 2012)(Amended 20XX)

(Added 1983) **(Amended 20XX)**

B2: FLR-1 A Section 3.7. Kerosene (Kerosine).

Purpose:
This proposal is to harmonize the method of sale for kerosene between NIST Handbook 130, Uniform Regulation for the Method of Sale of Commodities and the Uniform Engine Fuels and Automotive Lubricants Regulation.

Item under Consideration:
Amend NIST Handbook 130, Uniform Engine Fuels and Automotive Lubricants Regulation as follows:

3.7. Kerosene (Kerosine).

3.7.1. Standard Specification –All kerosene kept, offered, exposed for sale, or sold shall be identified as such and will include, with the word kerosene, an indication of its compliance with the latest version of ASTM Standard D3699, "Standard Specification for Kerosine."

3.7.~~1~~.2. Labeling of Grade Required. Kerosene shall be identified by the grades No. 1 K or No. 2 K.

Example:
1K Kerosene; Kerosene - 2K.

(Added 20XX)

3.7.~~2~~.3. Additional Labeling Requirements. – Each retail dispenser of kerosene shall be labeled as 1 K Kerosene or 2 K. In addition, No. 2 K dispensers shall display the following legend:

"Warning - Not Suitable For Use In Unvented Heaters Requiring No. 1 K."

The lettering of this legend shall not be less than 12.7 mm (½ in) in height by 1.5 mm ($^1/_{16}$ in) stroke; block style letters and the color of lettering shall be in definite contrast to the background color to which it is applied.

3.7.4. Retail Sale from Bulk. – All kerosene kept, offered, or exposed for sale and sold from bulk at retail shall be in terms of the gallon or liter.

(Added 20XX)

(Amended 20XX)

B2: MOS-2 A Section 2.21. Liquefied Petroleum Gas.

Purpose:
This proposal is to harmonize the method of sale for liquefied petroleum gas between NIST Handbook 130, Uniform Regulation for the Method of Sale of Commodities and the Uniform Engine Fuels and Automotive Lubricants Regulation.

Item under Consideration:
Amend NIST Handbook 130, Uniform Method of Sale of Commodities Regulation as follows:

2.21. Liquefied Petroleum Gas (LPG). ~~– All liquefied petroleum gas, including, but not limited to propane, butane, and mixtures thereof, shall be kept, offered, exposed for sale, or sold by the pound, metered cubic foot~~ ~~*[NOTE 7, page XX]*~~ **~~of vapor (defined as 1 ft^3 at 60 °F [15.6 °C]), or the gallon (defined as 231 in^3 at 60 °F [15.6 °C]).~~**

~~**All metered sales by the gallon, except those using meters with a maximum rated capacity of 20 gal/min or less, shall be accomplished by use of a meter and device that automatically compensates for temperature.**~~

2.21.1. How LPG is to be Identified. – Liquefied petroleum gases shall be identified by grades Commercial Propane, Commercial Butane, Commercial PB Mixtures or Special-Duty Propane (HD5).

2.21.2. Liquefied Petroleum Gas. – All liquefied petroleum gas, including, but not limited to propane, butane, and mixtures thereof, shall be kept, offered, exposed for sale, or sold by the pound, metered cubic foot [*NOTE 7*, page XXX] of vapor (defined as 1 ft^3 at 60 °F [15.6 °C]), or the gallon (defined as 231 in^3 at 60 °F [15.6 °C]). All metered sales by the gallon, except those using meters with a maximum rated capacity of 20 gal/min or less, shall be accomplished by use of a meter and device that automatically compensates for temperature.

(Added 1986)**(Amended 20XX)**

2.21.3. Retail Dispenser Labeling. – Each retail dispenser of LPGs shall be labeled as "Commercial Propane," "Commercial Butane," "Commercial PB Mixtures," or "Special-Duty Propane (HD5)."

2.21.4. Additional Labeling Requirements. – LPG shall be labeled with its automotive fuel rating in accordance with 16 CFR 306.

2.21.5. NFPA Labeling Requirements Also Apply. (Refer to the most recent edition of NFPA 58.)

NOTE 7: *Sources: American National Standards Institute, Inc., "American National Standard for Gas Displacement Meters (500 Cubic Feet per Hour Capacity and Under)," First edition, 1974, and NIST Handbook 44, "Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices."*

(Amended 20XX)

B2: FLR-2 A Section 3.10. Liquefied Petroleum Gas.

Purpose:

This proposal is to harmonize the method of sale for liquefied petroleum gas between NIST Handbook 130, Uniform Regulation for the Method of Sale of Commodities and the Uniform Engine Fuels and Automotive Lubricants Regulation.

Item under Consideration:

Amend NIST Handbook 130, Uniform Engine Fuels and Automotive Lubricants Regulation as follows:

3.10. Liquefied Petroleum Gas (LPG).

3.10.1. How LPG is to be Identified. – Liquefied petroleum gases shall be identified by grades Commercial Propane, Commercial Butane, Commercial PB Mixtures or Special-Duty Propane (HD5).

3.10.2. Liquefied Petroleum Gas. – All liquefied petroleum gas, including, but not limited to propane, butane, and mixtures thereof, shall be kept, offered, exposed for sale, or sold by the pound, metered cubic foot [*NOTE X*, page XXX] of vapor (defined as 1 ft^3 at 60 °F [15.6 °C]), or the gallon (defined as 231 in^3 at 60 °F [15.6 °C]). All metered sales by the gallon, except those using meters with a maximum rated capacity of 20 gal/min or less, shall be accomplished by use of a meter and device that automatically compensates for temperature.

(Added 20XX)

3.10.~~2.~~3. Retail Dispenser Labeling. – Each retail dispenser of LPGs shall be labeled as "Commercial Propane," "Commercial Butane," "Commercial PB Mixtures," or "Special-Duty Propane (HD5)."

3.10.~~3.~~4. Additional Labeling Requirements. – LPG shall be labeled with its automotive fuel rating in accordance with 16 CFR 306.

3.10.~~4.~~5. NFPA Labeling Requirements Also Apply. - (Refer to the most recent edition of NFPA 58.)

NOTE X: Sources: American National Standards Institute, Inc., "American National Standard for Gas Displacement Meters (500 Cubic Feet per Hour Capacity and Under)," First edition, 1974, and NIST Handbook 44, "Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices."

(Added 20XX)

B2: MOS-3 A Sections 2.20. Automotive Gasoline and Automotive Gasoline-Oxygenate Blends, 2.XX. Diesel Fuel. 2.XX. Aviation Turbine Fuels, 2.XX. Aviation Gasoline, 2.XX. Fuel Oils, and 2.XX M85 Fuel Methanol

Purpose:
To consolidate the method of sale information for fuels, lubricants and automotive products into one regulation in Handbook 130.

Item under Consideration:
Amend NIST Handbook 130, Uniform Method of Sale of Commodities Regulation as follows:

2.20. Automotive Gasoline and Automotive Gasoline-Oxygenate Blends.

~~**2.20.1. Method of Retail Sale. – Type of Oxygenate must be Disclosed. – All automotive gasoline or automotive gasoline-oxygenate blends kept, offered, or exposed for sale, or sold at retail containing at least 1.5 mass percent oxygen shall be identified as "with" or "containing" (or similar wording) the predominant oxygenate in the engine fuel. For example, the label may read "contains ethanol" or "with MTBE." The oxygenate contributing the largest mass percent oxygen to the blend shall be considered the predominant oxygenate. Where mixtures of only ethers are present, the retailer may post the predominant oxygenate followed by the phrase "or other ethers" or alternatively post the phrase "contains MTBE or other ethers." In addition, gasoline-methanol blend fuels containing more than 0.15 mass percent oxygen from methanol shall be identified as "with" or "containing" methanol. This information shall be posted on the upper 50 % of the dispenser front panel in a position clear and conspicuous from the driver's position in a type at least 12.7 mm (½ in) in height, 1.5 mm (1/16 in) stroke (width of type).**~~

~~**(Amended 1996)**~~

~~**2.20.2. Documentation for Dispenser Labeling Purposes. – The retailer shall be provided, at the time of delivery of the fuel, on product transfer documents such as an invoice, bill of lading, shipping paper, or other documentation:**~~

~~**(a) Information that complies with 40 CFR 80.1503 when the fuel contains ethanol.**~~

~~**(b) For fuels that do not contain ethanol, information that complies with 40 CFR 80.1503 and a declaration of the predominant oxygenate or combination of oxygenates present in concentrations sufficient to yield an oxygen content of at least 1.5 mass percent in the fuel. Where mixtures of only ethers are present, the fuel supplier may identify either the predominant oxygenate in the fuel (i.e., the oxygenate contributing the largest mass percent oxygen) or alternatively, use the phrase "contains MTBE or other ethers."**~~

~~**(c) Gasoline containing more than 0.15 mass percent oxygen from methanol shall be identified as "with" or "containing" methanol.**~~

~~**(Added 1984) (Amended 1985, 1986, 1991, 1996, and 2014)**~~

2.20.1. Posting of Antiknock Index Required. – All automotive gasoline and automotive gasoline-oxygenate blends shall post the antiknock index in accordance with applicable regulations, 16 CFR 306 issued pursuant to the Petroleum Marketing Practices Act, as amended.

(Added 20XX)

2.20.2. When the Term "Leaded" May be Used. – The term "leaded" shall be used only when the fuel meets specification requirements of Section 2.1.5. Minimum Lead Content to be Termed "Leaded."

(Added 20XX)

2.20.3. Use of Lead Substitute Must be Disclosed. – Each dispensing device from which gasoline or gasoline-oxygenate blends containing a lead substitute is dispensed shall display the following legend: "Contains Lead Substitute." The lettering of this legend shall not be less than 12.7 mm (½ in) in height and the color of the lettering shall be in definite contrast to the background color to which it is applied.

(Added 20XX)

2.20.4. Nozzle Requirements for Leaded Fuel. – Each dispensing device from which gasoline or gasoline-oxygenate blends that contain lead in amounts sufficient to be considered "leaded" gasoline, or lead substitute engine fuel, is sold shall be equipped with a nozzle spout having a terminal end with an outside diameter of not less than 23.63 mm (0.930 in).

(Added 20XX)

2.20.5. Prohibition of Terms. – It is prohibited to use specific terms to describe a grade of gasoline or gasoline-oxygenate blend unless it meets the minimum antiknock index requirement shown in Table 4. Minimum Antiknock Index Requirements.

(Added 20XX)

Table 4.
Minimum Antiknock Index Requirements

Term	Minimum Antiknock Index	
	ASTM D4814 Altitude Reduction Areas IV and V	**All Other ASTM D4814 Areas**
Premium, Super, Supreme, High Test	**90**	**91**
Midgrade, Plus	**87**	**89**
Regular Leaded	**86**	**88**
Regular, Unleaded (alone)	**85**	**87**
Economy	**--**	**86**

(Table 1. Amended 1997)

2.20.6. Method of Retail Sale. – Type of Oxygenate must be disclosed. All automotive gasoline or automotive gasoline-oxygenate blends kept, offered, or exposed for sale, or sold at retail containing at least 1.5 mass percent oxygen shall be identified as "with" or "containing" (or similar wording) the predominant oxygenate in the engine fuel. For example, the label may read "contains ethanol" or "with methyl tertiary-butyl ether (MTBE)." The oxygenate contributing the largest mass percent oxygen to the blend shall be considered the predominant oxygenate. Where mixtures of only ethers are present, the retailer may post

the predominant oxygenate followed by the phrase "or other ethers" or alternatively post the phrase "contains MTBE or other ethers." In addition, gasoline-methanol blend fuels containing more than 0.15 mass percent oxygen from methanol shall be identified as "with" or "containing" methanol. This information shall be posted on the upper 50 % of the dispenser front panel in a position clear and conspicuous from the driver's position in a type at least 12.7 mm (½ in) in height, 1.5 mm ($^{1}/_{16}$ in) stroke (width of type).

(Amended 1996)

2.20.7. Documentation for Dispenser Labeling Purposes. – The retailer shall be provided, at the time of delivery of the fuel, on product transfer documents such as an invoice, bill of lading, shipping paper, or other documentation:

(a) Information that compiles with 40 CFR 80.1503 when the fuel contains ethanol.

(Added 2014)

(b) For fuels that do not contain ethanol, information that complies with 40 CFR 80.1503 and a declaration of the predominant oxygenate or combination of oxygenates present in concentrations sufficient to yield an oxygen content of at least 1.5 mass percent in the fuel. Where mixtures of only ethers are present, the fuel supplier may identify either the predominant oxygenate in the fuel (i.e., the oxygenate contributing the largest mass percent oxygen) or alternatively, use the phrase "contains MTBE or other ethers."

(Added 2014)

(c) Gasoline containing more than 0.15 mass percent oxygen from methanol shall be identified as "with" or "containing" methanol.

(Added 2014)

(Amended 1996 and 2014)

2.20.8. EPA Labeling Requirements Also Apply. – Retailers and wholesale purchaser-consumers of gasoline shall comply with the EPA pump labeling requirements for gasoline containing greater than 10 volume percent (v%) up to 15 volume percent (v%) ethanol (E15) under 40 CFR 80.1501.

(Added 2012)

2.XX. Diesel Fuel.

2.XX.1. Labeling of Grade Required. – Diesel Fuel shall be identified by grades Jet A, Jet A 1, or Jet B.

2.XX.2. EPA Labeling Requirements Also Apply. – Retailers and wholesale purchaser-consumers of diesel fuel shall comply with EPA pump labeling requirements for sulfur under 40 CFR 80.570.

2.XX.3. Delivery Documentation for Premium Diesel. – Before or at the time of delivery of premium diesel fuel, the retailer or the wholesale purchaser-consumer shall be provided on an invoice, bill of lading, shipping paper, or other documentation a declaration of all performance properties that qualifies the fuel as premium diesel fuel as required in Section 2.2.1. Premium Diesel Fuel.

(Added 1998) (Amended 1999)

2.XX.4. Nozzle Requirements for Diesel Fuel. – Each dispensing device from which diesel fuel is sold at retail shall be equipped with a nozzle spout with a diameter that conforms to the latest version of SAE J285, "Dispenser Nozzle Spouts for Liquid Fuels Intended for Use with Spark Ignition and Compression Ignition Engines." (Enforceable effective July 1, 2013)

(Added 2012)

(Amended 1998, 1999, 2008, and 2012)

2.XX. Aviation Turbine Fuels.

2.XX.1. Labeling of Grade Required. – Aviation turbine fuels shall be identified by Jet A, Jet A 1, or Jet B.

2.XX.2. NFPA Labeling Requirements Also Apply. – Each dispenser or airport fuel truck dispensing aviation turbine fuels shall be labeled in accordance with the latest version of National Fire Protection Association (NFPA 407), Standard for Aircraft Fuel Servicing.

NOTE: For example, NFPA 407, 2007 edition: Section 4.3.18 Product Identification Signs. Each aircraft fuel servicing vehicle shall have a sign on each side and the rear to indicate the product. The sign shall have letters at least 75 mm (3 in) high of color sharply contrasting with its background for visibility. It shall show the word "FLAMMABLE" and the name of the product carried, such as "JET A," "JET B," "GASOLINE," or "AVGAS." (NOTE: Refer to the most recent edition NFPA 407.)

2.XX. Aviation Gasoline.

2.XX.1. Labeling of Grade Required. – Aviation gasoline shall be identified by Grade 80, Grade 91, Grade 100, or Grade 100LL, or Grade 82UL.
(Amended 2008)

2.XX.2. NFPA Labeling Requirements Also Apply. – Each dispenser or airport fuel truck dispensing aviation gasoline shall be labeled in accordance with the latest version of National Fire Protection Association (NFPA) 407, Standard for Aircraft Fuel Servicing.

NOTE: For example, NFPA 407, 2007 edition: Section 4.3.18. Product Identification Signs. Each aircraft fuel servicing vehicle shall have a sign on each side and the rear to indicate the product. The sign shall have letters at least 3 in (75 mm) high of color sharply contrasting with its background for visibility. It shall show the word "FLAMMABLE" and the name of the product carried, such as "JET A," "JET B," "GASOLINE," or "AVGAS." (NOTE: Refer to the most recent edition NFPA 407.)

2.XX. Fuel Oils.

2.XX.1. Labeling of Grade Required. – Fuel Oil shall be identified by the grades of No. 1 S500, No. 1 S5000, No. 2 S500, No. 2 S5000, No. 4 (Light), No. 4, No. 5 (Light), No. 5 (Heavy), or No. 6.
(Amended 2008)

2.XX. M85 Fuel Methanol.

2.XX.1. How to Identify M85 Fuel Methanol. – Fuel methanol shall be identified as M85.

Example:
M85

2.XX.2. Retail Dispenser Labeling.

(a) Fuel methanol shall be labeled with its automotive fuel rating in accordance with 16 CFR 306.

Example:
M85 Methanol

(b) A label shall be posted which states "For Use in Vehicles Capable of Using M85 Only." This information shall be clearly and conspicuously posted on the upper 50 % of the dispenser front panel in a type of at least 12.7 mm (½ in) in height, 1.5 mm ($^{1}/_{16}$ in) stroke (width of type).

(Amended 2008)

B2: FLR-3 A Section 3. Classification and Method of Sale of Petroleum Products

Purpose:
To consolidate the method of sale information for fuels, lubricants and automotive products into one regulation in Handbook 130.

Item under Consideration:
Amend NIST Handbook 130, Uniform Engine Fuels and Automotive Lubricants Regulation as follows:

3.1. General Considerations.

3.1.1. ~~Documentation. When products regulated by this rule are sold, an invoice, bill of lading, shipping paper, or other documentation must accompany each delivery other than a retail sale. This document must identify the quantity, the name of the product, the particular grade of the product, the applicable automotive fuel rating, and oxygenate type and content (if applicable), the name and address of the seller and buyer, and the date and time of the sale. Documentation must be retained at the retail establishment for a period not less than one year~~. <u>Classification and Method of Sale of Fuels of Petroleum Products – The classification and method of sale requirements set forth in the NIST Handbook 130, Uniform Commodities, Section 3. Classification and Method of Sale of Fuels, Lubricants and Automotive Products is incorporated into this section by reference.</u>

(Amended 2008)**<u>(Amended 20XX)</u>**

~~3.1.2. Retail Dispenser Labeling. All retail dispensing devices must identify conspicuously the type of product, the particular grade of the product, and the applicable automotive fuel rating.~~

~~3.1.3. Grade Name. The sale of any product under any grade name that indicates to the purchaser that it is of a certain automotive fuel rating or ASTM grade shall not be permitted unless the automotive fuel rating or grade indicated in the grade name is consistent with the value and meets the requirements of Section 2, Standard Fuel Specifications.~~

~~3.2. Automotive Gasoline and Automotive Gasoline-Oxygenate Blends.~~

~~3.2.1. Posting of Antiknock Index Required. All automotive gasoline and automotive gasoline-oxygenate blends shall post the antiknock index in accordance with applicable regulations, 16 CFR 306 issued pursuant to the Petroleum Marketing Practices Act, as amended.~~

~~3.2.2. When the Term "Leaded" May be Used. The term "leaded" shall be used only when the fuel meets specification requirements of paragraph 2.1.5. Minimum Lead Content to be Termed "Leaded."~~

~~3.2.3. Use of Lead Substitute Must be Disclosed. Each dispensing device from which gasoline or gasoline-oxygenate blends containing a lead substitute is dispensed shall display the following legend: "Contains Lead Substitute." The lettering of this legend shall not be less than 12.7 mm (½ in) in height and the color of the lettering shall be in definite contrast to the background color to which it is applied.~~

~~3.2.4. Nozzle Requirements for Leaded Fuel. Each dispensing device from which gasoline or gasoline-oxygenate blends that contain lead in amounts sufficient to be considered "leaded" gasoline, or lead substitute engine fuel, is sold shall be equipped with a nozzle spout having a terminal end with an outside diameter of not less than 23.63 mm (0.930 in).~~

~~3.2.5. Prohibition of Terms. It is prohibited to use specific terms to describe a grade of gasoline or gasoline-oxygenate blend unless it meets the minimum antiknock index requirement shown in Table 1. Minimum Antiknock Index Requirements.~~

~~**Table 1. Minimum Antiknock Index Requirements**~~		
	~~**Minimum Antiknock Index**~~	
~~**Term**~~	~~**ASTM D4814 Altitude Reduction Areas IV and V**~~	~~**All Other ASTM D4814 Areas**~~
~~**Premium, Super, Supreme, High Test**~~	~~**90**~~	~~**91**~~
~~**Midgrade, Plus**~~	~~**87**~~	~~**89**~~
~~**Regular Leaded**~~	~~**86**~~	~~**88**~~
~~**Regular, Unleaded (alone)**~~	~~**85**~~	~~**87**~~
~~**Economy**~~	~~**--**~~	~~**86**~~

~~**(Table 1. Amended 1997)**~~

~~**3.2.6. Method of Retail Sale. – Type of Oxygenate must be disclosed. All automotive gasoline or automotive gasoline-oxygenate blends kept, offered, or exposed for sale, or sold at retail containing at least 1.5 mass percent oxygen shall be identified as "with" or "containing" (or similar wording) the predominant oxygenate in the engine fuel. For example, the label may read "contains ethanol" or "with methyl *tertiary*-butyl ether (MTBE)." The oxygenate contributing the largest mass percent oxygen to the blend shall be considered the predominant oxygenate. Where mixtures of only ethers are present, the retailer may post the predominant oxygenate followed by the phrase "or other ethers" or alternatively post the phrase "contains MTBE or other ethers." In addition, gasoline-methanol blend fuels containing more than 0.15 mass percent oxygen from methanol shall be identified as "with" or "containing" methanol. This information shall be posted on the upper 50 % of the dispenser front panel in a position clear and conspicuous from the driver's position in a type at least 12.7 mm (½ in) in height, 1.5 mm (1/16 in) stroke (width of type).**~~

~~**(Amended 1996)**~~

~~**3.2.7. Documentation for Dispenser Labeling Purposes. – The retailer shall be provided, at the time of delivery of the fuel, on product transfer documents such as an invoice, bill of lading, shipping paper, or other documentation:**~~

~~**(a) Information that compiles with 40 CFR 80.1503 when the fuel contains ethanol.**~~

~~**(Added 2014)**~~

~~**(b) For fuels that do not contain ethanol, information that complies with 40 CFR 80.1503 and a declaration of the predominant oxygenate or combination of oxygenates present in concentrations sufficient to yield an oxygen content of at least 1.5 mass percent in the fuel. Where mixtures of only ethers are present, the fuel supplier may identify either the predominant oxygenate in the fuel (i.e., the oxygenate contributing the largest mass percent oxygen) or alternatively, use the phrase "contains MTBE or other ethers."**~~

~~**(Added 2014)**~~

~~**(c) Gasoline containing more than 0.15 mass percent oxygen from methanol shall be identified as "with" or "containing" methanol.**~~

~~**(Added 2014)**~~

~~**(Amended 1996 and 2014)**~~

~~**3.2.8. EPA Labeling Requirements Also Apply. – Retailers and wholesale purchaser-consumers of gasoline shall comply with the EPA pump labeling requirements for gasoline containing greater than 10 volume percent (v%) up to 15 volume percent (v%) ethanol (E15) under 40 CFR 80.1501.**~~

~~**(Added 2012)**~~

~~**3.3. Diesel Fuel.**~~

~~**3.3.1. Labeling of Grade Required. – Diesel Fuel shall be identified by grades No. 1-D, No. 2-D, or No. 4-D.**~~

~~**3.3.2. EPA Labeling Requirements Also Apply. – Retailers and wholesale purchaser-consumers of diesel fuel shall comply with EPA pump labeling requirements for sulfur under 40 CFR 80.570.**~~

~~**3.3.3. Delivery Documentation for Premium Diesel. – Before or at the time of delivery of premium diesel fuel, the retailer or the wholesale purchaser-consumer shall be provided on an invoice, bill of lading, shipping paper, or other documentation a declaration of all performance properties that qualifies the fuel as premium diesel fuel as required in Section 2.2.1. Premium Diesel Fuel.**~~

~~**(Added 1998) (Amended 1999)**~~

~~**3.3.4. Nozzle Requirements for Diesel Fuel. – Each dispensing device from which diesel fuel is sold at retail shall be equipped with a nozzle spout with a diameter that conforms to the latest version of SAE J285, "Dispenser Nozzle Spouts for Liquid Fuels Intended for Use with Spark Ignition and Compression Ignition Engines." (Enforceable effective July 1, 2013)**~~

~~**(Added 2012)**~~

~~**(Amended 1998, 1999, 2008, and 2012)**~~

~~**3.4. Aviation Turbine Fuels.**~~

~~**3.4.1. Labeling of Grade Required. – Aviation turbine fuels shall be identified by Jet A, Jet A-1, or Jet B.**~~

~~**3.4.2. NFPA Labeling Requirements Also Apply. – Each dispenser or airport fuel truck dispensing aviation turbine fuels shall be labeled in accordance with the most recent edition of National Fire Protection Association (NFPA 407), Standard for Aircraft Fuel Servicing.**~~

~~***NOTE: For example, NFPA 407, 2007 edition: Section 4.3.18 Product Identification Signs. Each aircraft fuel servicing vehicle shall have a sign on each side and the rear to indicate the product. The sign shall have letters at least 75 mm (3 in) high of color sharply contrasting with its background for visibility. It shall show the word "FLAMMABLE" and the name of the product carried, such as "JET A," "JET B," "GASOLINE," or "AVGAS." (NOTE: Refer to the most recent edition NFPA 407.)***~~

~~**3.5. Aviation Gasoline.**~~

~~**3.5.1. Labeling of Grade Required. – Aviation gasoline shall be identified by Grade 80, Grade 91, Grade 100, or Grade 100LL, or Grade 82UL**~~

~~**(Amended 2008)**~~

~~**3.5.2. NFPA Labeling Requirements Also Apply. – Each dispenser or airport fuel truck dispensing aviation gasoline shall be labeled in accordance with the most recent edition of National Fire Protection Association (NFPA) 407, Standard for Aircraft Fuel Servicing.**~~

~~***NOTE: For example, NFPA 407, 2007 edition: Section 4.3.18 Product Identification Signs. Each aircraft fuel servicing vehicle shall have a sign on each side and the rear to indicate the product. The sign shall have letters at least 3 in (75 mm) high of color sharply contrasting with its background for visibility. It shall show the word "FLAMMABLE" and the name of the product carried, such as "JET A," "JET B," "GASOLINE," or "AVGAS." (NOTE: Refer to the most recent edition NFPA 407.)***~~

~~**3.6. Fuel Oils.**~~

~~**3.6.1. Labeling of Grade Required. – Fuel Oil shall be identified by the grades of No. 1 S500, No. 1 S5000, No. 2 S500, No. 2 S5000, No. 4 (Light), No. 4, No. 5 (Light), No. 5 (Heavy), or No. 6.**~~

~~**(Amended 2008)**~~

~~**3.7. Kerosene (Kerosine).**~~

~~**3.7.1. Labeling of Grade Required. – Kerosene shall be identified by the grades No. 1-K or No. 2-K.**~~

~~**3.7.2. Additional Labeling Requirements. – Each retail dispenser of kerosene shall be labeled as 1-K Kerosene or 2-K. In addition, No. 2-K dispensers shall display the following legend:**~~

~~**"Warning – Not Suitable For Use in Unvented Heaters Requiring No. 1-K.)**~~

~~**The lettering of this legend shall not be less than 12.7 mm (½ in) in height by 1.5 mm (1/16 in) stroke; block style letters and the color of lettering shall be in definite contrast to the background color to which it is applied.**~~

~~**3.8. Ethanol Flex Fuel**~~

~~**3.8.1. How to Identify Ethanol Flex Fuel. – Ethanol flex fuel shall be identified as Ethanol Flex Fuel or EXX Flex Fuel.**~~

~~**3.8.2. Labeling Requirements.**~~

~~**(a) Ethanol flex fuel with an ethanol concentration no less than 51 and no greater than 83 volume percent shall be labeled "Ethanol Flex Fuel, minimum 51 % ethanol."**~~

~~**(b) Ethanol flex fuel with an ethanol concentration less than or equal to 50 volume percent shall be labeled "EXX Flex Fuel, minimum YY % ethanol," where the XX is the ethanol concentration in volume percent and YY is XX minus five (− 5). The actual ethanol concentration of the fuel shall be XX volume percent plus or minus five (± 5) volume percent.**~~

~~**(Added 2014)**~~

~~**(c) A label shall be posted which states "For Use in Flexible Fuel Vehicles (FFV) Only." This information shall be clearly and conspicuously posted on the upper 50 % of the dispenser front panel in a type at least 12.7 mm (½ in) in height, 1.5 mm (1/16 in) stroke (width of type). A label shall be posted which states, "CHECK OWNER'S MANUAL," and shall not be less than 6 mm (¼ in) in height by 0.8 mm (1/32 in) stroke; block style letters and the color shall be in definite contrast to the background color to which it is applied.**~~

~~**(Amended 2007, 2008, and 2014)**~~

~~**3.9. M85 Fuel Methanol.**~~

~~**3.9.1. How to Identify M85 Fuel Methanol. – Fuel methanol shall be identified as M85.**~~

~~**Example:**~~
~~**M85**~~

~~**3.9.2. Retail Dispenser Labeling.**~~

~~**(a) Fuel methanol shall be labeled with its automotive fuel rating in accordance with 16 CFR 306.**~~

~~**Example:**~~
~~**M85 Methanol**~~

~~**(b) A label shall be posted which states "For Use in Vehicles Capable of Using M85 Only." This information shall be clearly and conspicuously posted on the upper 50 % of the dispenser front panel in a type of at least 12.7 mm (½ in) in height, 1.5 mm (¹⁄₁₆ in) stroke (width of type).**~~

~~**(Amended 2008)**~~

~~**3.10. Liquefied Petroleum Gas (LPG).**~~

~~**3.10.1. How LPG is to be Identified. Liquefied petroleum gases shall be identified by grades Commercial Propane, Commercial Butane, Commercial PB Mixtures or Special-Duty Propane (HD5).**~~

~~**3.10.2. Retail Dispenser Labeling. – Each retail dispenser of LPGs shall be labeled as "Commercial Propane," "Commercial Butane," "Commercial PB Mixtures," or "Special-Duty Propane (HD5)."**~~

~~**3.10.3. Additional Labeling Requirements. – LPG shall be labeled with its automotive fuel rating in accordance with 16 CFR 306.**~~

~~**3.10.4. NFPA Labeling Requirements Also Apply. (Refer to the most recent edition of NFPA 58.)**~~

~~**3.11. Compressed Natural Gas (CNG).**~~

~~**3.11.1. How Compressed Natural Gas is to be Identified. For the purposes of this regulation, compressed natural gas shall be identified by the term "Compressed Natural Gas" or "CNG."**~~

~~**3.11.2. Retail Sales of Compressed Natural Gas Sold as a Vehicle Fuel.**~~

~~**3.11.2.1. Retail Dispenser Labeling.**~~

~~**3.11.2.1.1. Identification of Product. Each retail dispenser of CNG shall be labeled as "Compressed Natural Gas."**~~

~~**3.11.2.1.2. Pressure. – CNG is dispensed into vehicle fuel containers with working pressures of 20 684 kPa (3000 psi), or 24 821 kPa (3600 psi). The dispenser shall be labeled 20 684 kPa (3000 psi), or 24 821 kPa (3600 psi) corresponding to the pressure of the CNG dispensed by each fueling hose.**~~

~~**(Amended 2016)**~~

~~**3.11.2.1.3. NFPA Labeling. – NFPA Labeling requirements also apply. (Refer to NFPA 52.)**~~

~~**3.11.3. Nozzle Requirements for CNG. CNG fueling nozzles shall comply with ANSI/AGA/CGA NGV 1.**~~

~~**3.12. Liquefied Natural Gas (LNG).**~~

~~**3.12.1. How Liquefied Natural Gas is to be Identified. For the purposes of this regulation, liquefied natural gas shall be identified by the term "Liquefied Natural Gas" or "LNG."**~~

~~**3.12.2. Labeling of Retail Dispensers of Liquefied Natural Gas Sold as a Vehicle Fuel.**~~

~~**3.12.2.1. Identification of Product. Each retail dispenser of LNG shall be labeled as "Liquefied Natural Gas."**~~

~~**3.12.2.2. Automotive Fuel Rating. – LNG automotive fuel shall be labeled with its automotive fuel rating in accordance with 16 CFR 306.**~~

~~**3.12.2.3. NFPA Labeling. – NFPA Labeling requirements also apply. (Refer to NFPA 57.)**~~

~~**3.13. Oil.**~~

~~**3.13.1. Labeling of Vehicle Engine (Motor) Oil Required.**~~

~~**3.13.1.1. Viscosity. – The label on any vehicle engine (motor) oil container, receptacle, dispenser, or storage tank and the invoice or receipt from service on an engine that includes the installation of bulk vehicle engine (motor) oil dispensed from a receptacle, dispenser, or storage tank shall contain the viscosity grade classification preceded by the letters "SAE" in accordance with the SAE International's latest version of SAE J300, "Engine Oil Viscosity Classification."**~~

~~**(Amended 2012 and 2014)**~~

~~**3.13.1.2. Brand. – The label on any vehicle engine (motor) oil container and the invoice or receipt from service on an engine that includes the installation of bulk vehicle engine (motor) oil dispensed from a receptacle, dispenser, or storage tank shall contain the name, brand, trademark, or trade name of the vehicle engine (motor) oil.**~~

~~**(Added 2012 and 2014)**~~

~~**3.13.1.3. Engine Service Category. – The label on any vehicle engine (motor) oil container, receptacle, dispenser or storage tank and the invoice or receipt from service on an engine that includes the installation of bulk vehicle engine (motor) oil dispensed from a receptacle, dispenser, or storage tank shall contain the engine service category, or categories, displayed in letters not less than 3.18 mm (1/8 in) in height, as defined by the latest version of SAE J183, "Engine Oil Performance and Engine Service Classification (Other than "Energy Conserving")" API Publication 1509, "Engine Oil Licensing and Certification System," European Automobile Manufacturers Association (ACEA), "European Oil Sequences," or other "Vehicle or Engine Manufacturer Standards" as provided in Section 3.13.1.3.1. Vehicle or Engine Manufacturer Standard.**~~

~~**(Amended 2012 and 2014)**~~

~~**3.13.1.3.1. Vehicle or Engine Manufacturer Standard. – The label on any vehicle engine (motor) oil container, receptacle, dispenser, or storage tank and the invoice or receipt from service on an engine that includes the installation of vehicle engine (motor) oil dispensed from a receptacle, dispenser, or storage tank shall identify the specific vehicle or engine manufacturer standard, or standards, met in letters not less than 3.18 mm (1/8 in) in height. If the vehicle (motor) oil only meets a vehicle or engine manufacturer standard, the label must clearly identify that the oil is only intended for use where specifically recommended by the vehicle or engine manufacturer.**~~

~~**(Added 2014)**~~

~~**3.13.1.3.2. Inactive or Obsolete Service Categories. – The label on any vehicle engine (motor) oil container, receptacle, dispenser, or storage tank and the invoice or receipt from service on an engine that includes the installation of vehicle engine (motor) oil dispensed from a receptacle, dispenser, or storage tank shall bear a plainly visible cautionary statement in compliance with the latest version of SAE J183, "Engine Oil Performance and Engine Service Classification (Other than "Energy Conserving")" Appendix A, whenever the vehicle engine (motor) oil in the container or in bulk does not meet an active API service category as defined by the latest version of SAE J183, "Engine Oil Performance and Engine Service Classification (Other than "Energy Conserving")." If a vehicle engine (motor) oil is identified as only meeting a vehicle or engine manufacturer standard, the labeling requirements in Section 3.13.1.3.1. Vehicle or Engine Manufacturer Standard applies.**~~

~~**(Added 2012) (Amended 2014)**~~

~~**3.13.1.4. Tank Trucks or Rail Cars. – Tank trucks, rail cars, and types of delivery trucks that are used to deliver bulk vehicle engine (motor) oil are not required to display the SAE viscosity grade and service category or categories on such tank trucks, rail cars, and other types of delivery trucks.**~~

~~**(Added 2012) (Amend 2013 and 2014)**~~

~~**3.13.1.5. Documentation. – When the engine (motor) oil is sold in bulk, an invoice, bill of lading, shipping paper, or other documentation must accompany each delivery. This document must identify the quantity of bulk engine (motor) oil delivered as defined in Sections 3.13.1.1. Viscosity; 3.13.1.2. Brand; 3.13.1.3. Engine Service Category; the name and address of the seller and buyer; and the date and time of the sale. For inactive or obsolete service categories, the documentation shall also bear a plainly visible cautionary statement as required in Section 3.13.1.3.2. Inactive or Obsolete Service Categories. Documentation must be retained at the retail establishment for a period of not less than one year.**~~

~~**(Added 2013) (Amended 2014)**~~

~~**(Amended 2012, 2013, and 2014)**~~

~~**3.13.2. Labeling of Recreational Motor Oil.**~~

~~**3.13.2.1. Viscosity. – The label on each container of recreational motor oil shall contain the viscosity grade classification preceded by the letters "SAE" in accordance with the SAE International's latest version of SAE J300, "Engine Oil Viscosity Classification."**~~

~~**3.13.2.2. Intended Use. – The label on each container of recreational motor oil shall contain a statement of its intended use in accordance with the latest version of SAE J300, "Engine Oil Viscosity Classification."**~~

~~**3.13.3. Labeling of Gear Oil.**~~

~~**3.13.3.1. Viscosity. – The label on each container of gear oil shall contain the viscosity grade classification preceded by the letters "SAE" in accordance with the SAE International's latest version of SAE J306, "Automotive Gear Lubricant Viscosity Classification" or SAE J300, "Engine Oil Viscosity Classification."**~~

~~**3.13.3.1.1. Exception. – Some automotive equipment manufacturers may not specify an SAE viscosity grade requirement for some applications. Gear oils intended to be used only in such applications are not required to contain an SAE viscosity grade on their labels.**~~

~~**3.13.3.2. Service Category. – The label on each container of gear oil shall contain the service category, or categories, in letters not less than 3.18 mm (1/8 in) in height, as defined by the latest version of SAE J308, "Axle and Manual Transmission Lubricants."**~~

~~**(Added 2004)**~~

~~**3.14. Transmission Fluid.**~~

~~**3.14.1. Labeling and Identification of Transmission Fluid. – Transmission fluid shall be labeled or identified as described below.**~~

~~**(Added 2017)**~~

~~**3.14.1.1. Container Labeling. – The label on a container of transmission fluid shall not contain any information that is false or misleading. Containers include bottles, cans, multi-quart or liter containers, pails, kegs, drums, and intermediate bulk containers (IBCs). In addition, each container of transmission fluid shall be labeled with the following:**~~

~~**(a) the brand name;**~~

~~**(b) the name and place of business of the manufacturer, packer, seller, or distributor;**~~

~~**(c) the words "Automatic Transmission Fluid," which may be incorporated into a more specific description of transmission type such as "Automatic Transmission Fluid" or "Continuously Variable Transmission Fluid";**~~

~~**(d) the primary performance claim or claims met by the fluid and reference to where any supplemental claims may be viewed (e.g., website reference). Performance claims include by are not limited to those set by original equipment manufacturers and standards setting organizations such as SAE and JASO and are acknowledged by reference; and**~~

~~**(e) an accurate statement of the quantity of the contents in terms of liquid measure.**~~

~~**(Amended 2017)**~~

~~**3.14.1.2. Identification on Documentation. – Transmission fluid sold in bulk shall be identified on the manufacturer, packer, seller or distributor invoice, bill of lading, shipping paper, or other documentation with the information listed below:**~~

~~(a) **the brand name;**~~

~~(b) **the name and place of business of the manufacturer, packer, seller, or distributor;**~~

~~(c) **the words "Transmission Fluid" which may be incorporated into a more specific description of transmission type such as "Automatic Transmission Fluid" or "Continuously Variable Transmission Fluid";**~~

~~(d) **the primary performance claim or claims met by the fluid or reference to where these claims may be viewed (e.g., website reference). Performance claims include but are not limited to those set by original equipment manufacturers and standards-setting organizations such as SAE and JASO and are acknowledged by reference; and**~~

~~(e) **an accurate statement of the quantity of the contents in terms of liquid measure.**~~

~~**(Added 2017)**~~

~~**3.14.1.3. Identification on Service Provider Documentation. – Transmission fluid installed from a bulk tank at time of transmission service shall be identified on the customer invoice with the information listed below:**~~

~~**(a) the brand name;**~~

~~**(b) the name and place of business of the service provider;**~~

~~**(c) the words "Transmission Fluid" which may be incorporated into a more specific description of transmission type such as "Automatic Transmission Fluid" or "Continuously Variable Transmission Fluid";**~~

~~**(d) the primary performance claim or claims met by the fluid or reference to where these claims may be viewed (e.g., website reference). Performance claims include but are not limited to those set by original equipment manufacturers and standards-setting organizations such as SAE and JASO and are acknowledged by reference; and**~~

~~**(e) an accurate statement of the quantity of the contents in terms of liquid measure.**~~

~~**(Added 2017)**~~

~~**3.14.1.4. Bulk Delivery. – When the transmission fluid is sold in bulk, an invoice, bill of lading, shipping paper, or other documentation must accompany each delivery. This document must identify the fluid as defined in Section 3.14.2. Container Labeling.**~~

~~**(Added 2017)**~~

~~**3.14.1.5. Storage Tank Labeling. – Each storage tank of transmission fluid shall be labeled with the following:**~~

~~**(a) the brand name;**~~

~~**(b) the primary performance claim or claims met by the fluid or reference to where these claims may be viewed (e.g., website reference). Performance claims include but are not limited to those set by original equipment manufacturers and standards-setting organizations such as SAE and JASO and are acknowledged by reference.**~~

~~**(Added 2017)**~~

~~**3.14.1.6. Documentation of Claims Made Upon Product Label. – Any manufacturer, packer, or distributor of any product subject to this article and sold in this state shall provide, upon request of duly authorized representatives of the Director, credible documentation of any claim made upon their product label, including claims made on any website referenced by said label. If the product performance claims published by blender and/or marketer are based on the claim(s) of one or more additive suppliers, documentation of the claims may be requested in confidence by a duly authorized representative of the Director. Supporting data may be supplied directly to the Director's office by the additive supplier(s).**~~

~~**(Added 2004) (Amended 2017)**~~

~~**3.15. Biodiesel and Biodiesel Blends.**~~

~~**3.15.1. Identification of Product. – Biodiesel shall be identified by the term "biodiesel" with the designation "B100." Biodiesel blends shall be identified by the term "Biodiesel Blend."**~~

~~**3.15.2. Labeling of Retail Dispensers.**~~

~~**3.15.2.1. Labeling of Grade Required. – Biodiesel shall be identified by the grades S15 or S500. Biodiesel blends shall be identified by the grades No. 1-D, No. 2-D, or No. 4-D.**~~

~~**3.15.2.2. EPA Labeling Requirements Also Apply. – Retailers and wholesale purchaser-consumers of biodiesel blends shall comply with EPA pump labeling requirements for sulfur under 40 CFR 80.570.**~~

~~**3.15.2.3. Automotive Fuel Rating. – Biodiesel and biodiesel blends shall be labeled with its automotive fuel rating in accordance with 16 CFR 306.**~~

~~**3.15.2.4. Biodiesel Blends. – When biodiesel blends greater than 20 % by volume are offered by sale, each side of the dispenser where fuel can be delivered shall have a label conspicuously placed that states "Consult Vehicle Manufacturer Fuel Recommendations."**~~

~~**The lettering of this legend shall not be less than 6 mm (¼ in) in height by 0.8 mm (1/32 in) stroke; block style letters and the color shall be in definite contrast to the background color to which it is applied.**~~

~~**3.15.3. Documentation for Dispenser Labeling Purposes. – The retailer shall be provided, at the time of delivery of the fuel, a declaration of the volume percent biodiesel on an invoice, bill of lading, shipping paper, or other document. This documentation is for dispenser labeling purposes only; it is the responsibility of any potential blender to determine the amount of biodiesel in the diesel fuel prior to blending.**~~

~~**3.15.4. Exemption. – Biodiesel blends that contain less than or equal to 5 % biodiesel by volume are exempted from the requirements of Sections 3.15.1. Identification of Product, 3.15.2. Labeling of Retail Dispensers, and 3.15.3. Documentation for Dispenser Labeling Purposes when it is sold as "diesel fuel" as required in Section 3.3. Diesel Fuel.**~~

~~**(Added 2005) (Amended 2008)**~~

~~**3.16. Diesel Exhaust Fluid (DEF).**~~

~~**3.16.1. Labeling of Diesel Exhaust Fluid (DEF). – DEF shall be labeled.**~~

~~**3.16.1.1. Retail Dispenser Labeling. – A label shall be clearly and conspicuously placed on the front panel of the DEF dispenser stating "for operation of selective catalytic reduction (SCR) converters in motor vehicles with diesel engines."**~~

~~**3.16.1.2. Documentation for Retailers of Bulk Product. – A DEF supplier shall provide, at the time of delivery of the bulk shipment of DEF, identification of the fluid's origin including the name of the fluid manufacturer, the brand name, trade name, or trademark, and a statement identifying the fluid as DEF conforming to specifications given in the latest version of ISO 22241, "Diesel engines – NOx reduction agent AUS 32." This information shall be provided by the supplier on an invoice, bill of lading, shipping paper, or other document.**~~

~~**3.16.1.3. Labeling Packaged Product. – Any DEF retail package shall bear a label that includes the name of the fluid manufacturer, the brand name, trade name, or trademark, a statement identifying the fluid as DEF conforming to specifications given in the latest version of ISO 22241, "Diesel engines NOx reduction agent AUX 32." And the statement, "It is recommended to store DEF between – 5 °C to 30 °C (23 °F to 86 °F)."**~~

~~**3.16.1.4. Documentation for Bulk Deliveries. – A carrier that transports or accepts for transportation any bulk shipment by tank truck, freight container, cargo tank, railcar, or any other vehicle used to transport or deliver bulk quantities of DEF shall, at the time of delivery of the DEF, provide identification of the fluid's origin including the name of the fluid manufacturer, the brand name, trade name, or trademark, and a statement identifying the fluid as DEF conforming to specifications given in the latest version of ISO 22241, "Diesel engines – NOx reduction agent AUS 32." This information shall be provided to the recipient on an invoice, bill of lading, shipping paper, or other document.**~~

~~**Effective date shall be January 1, 2016.**~~

~~**(Added 2014)**~~

B2: FLR-4 A Sections 1.12. Compressed Natural Gas (CNG), 1.14. Diesel Exhaust Fluid (DEF), 1.26. Gasoline Gallon Equivalent (GGE), 1.XX. Diesel Gallon Equivalent (DGE), and 1.36. Liquefied Natural Gas Equivalent (LNG)

Purpose:
To harmonize the definitions for natural gas fuels and diesel exhaust fluid in the NIST Handbook 130, Uniform Engine Fuels and Automotive Lubricants Regulation with the definitions in the Uniform Regulation for the Method of Sale of Commodities.

Item under Consideration:
Amend NIST Handbook 130, Uniform Engine Fuels and Automotive Lubricants Regulation as follows:

1.12. Compressed Natural Gas (CNG). – ~~**Natural gas which has been compressed and dispensed into fuel storage containers and is suitable for use as an engine fuel.**~~ <u>**A gaseous fuel composed primarily of methane that is suitable for compression and dispensing into a fuel storage container(s) for use as an engine fuel.**</u>

<u>**(Amended 20XX)**</u>

1.14. Diesel Exhaust Fluid (DEF). – A preparation of aqueous urea [(NH2)2CO], containing 32.5 % by mass of technically-pure urea in high-purity water with quality characteristics defined by the latest version of ISO 22241, "Diesel engines - NOx reduction agent AUS ~~21~~**32**."

1.26. Gasoline Gallon Equivalent (GGE). – ~~Equivalent to 2.567 kg (5.660 lb) of natural gas.~~ Gasoline gallon equivalent (GGE) means 2.567 kg (5.660 lb) of compressed natural gas.

(Amended 20XX)

1.XX. Diesel Gallon Equivalent (DGE). – Diesel gallon equivalent means 6.384 lb of compressed natural gas or 6.059 lb of liquefied natural gas.

(Added 20XX)

1.36. Liquefied Natural Gas (LNG). – Natural gas**, which is predominantly methane,** that has been liquefied at – 162 °C (− 260 °F) **at 14.696** psia and stored in insulated cryogenic **fuel storage tanks** for use as an engine fuel.

(Amended 20XX)

Background/Discussion:

(This item appeared on the 2017 Fall regional reports as Items New 1, New 2, New 3, New 4, New 5, New 6, and New 15. On the 2018 NCWM Interim and Annual Reports they appear as Item Block (2 (B2), B2: MOS-1, B2: FLR-1, B2: MOS-2, and B2: FLR-2.

In NIST Handbook 130, Method of Sale of Commodities and the Uniform Engine Fuels and Automotive Lubricants Regulations reflect different language for the method of sale for kerosene, liquefied petroleum gas, natural gas fuels, and diesel exhaust fluid. This proposal is to integrate the information from both regulations to create identical method of sale language in the two regulations.

Information for the method of sale for fuels, lubricants and automotive products may appear in the handbook in either the Uniform Regulation for the Method of Sale of Commodities and the Uniform Engine Fuels and Automotive Lubricants Regulation. In some areas information for the same product is stated different within the two regulations which creates an added burden when maintaining and updating the handbook. This proposal is to consolidate and reorganize that information into the Uniform Regulation for the Method of Sale of Commodities. This proposal is not intended to modify a specific method of sale, those modifications should be considered separately.

At the 2018 Interim Meeting, Mr. Chuck Corr (ADM) spoke on behalf of a work group under FALS and provided an overview of the Block 2 agenda items. Mr. Corr stated that the intent of these this item is to reorganize and harmonize language only, and not to make any substantial changes to the language. Mr. Bill Striejewske (FALS Chairman) commented that the FALS discussed these agenda items during their meeting and had concerns about possible conflicts between this item and the HB 130 working group (Refer to Item FLR-9 in 2018 NCWM Publication 16). Mr. Tim Elliott (Washington) commented that all state officials review the proposed language for possible conflicts with state regulations. Mr. Mike Sikula (New York) commented that there is inconsistency between FTC language (16 CFR 306) and this proposed language related past editions of NIST Handbook 130. Mr. Sikula stated that NIST Handbook 130 suggests the most current version of the regulation and FTC references a specific version. Mr. Sikula believes this inconsistency should be resolved prior to adoption. For these reasons, the L&R Committee decided to assign this block of items to FALS for further work.

At the 2018 NCWM Annual Meeting Mr. Striejewske (FALS Chair) updated the Committee that this item has undergone a major overhaul within the last six months. The submitter is currently contacting each state to see how it impacts the states. It was also noted that if L&R agenda Item FLR-9 was adopted, sections of this item would need to be modified to reflect the most recent language as it proceeds through the conference.

Regional Association Comments:

At the 2017 WWMA Annual Meeting, the Committee believed the item to be fully developed. The Committee stresses the importance of understanding aspects of the PowerPoint presentation and additional information located on the

NCWM 2018 Interim website prior to attending the next NCWM Meeting. The Committee recognizes that the intent of this group of items is to reflect identical language in both sections of NIST Handbook 130 but no substantive changes to the regulation. The WWMA recommended that it be an Informational item.

At the 2017 SWMA Annual Meeting, there was no opposition to this proposal. The submitter had originally requested this be a Developing item not wanting to cause any confusion with another proposal that were being moved forward at the NCWM 2017 Annual Meeting. The SWMA believes that this item is fully developed and recommends this as a Voting item.

At the 2017 CWMA Interim Meeting they were informed the purpose of these items is to consolidate the Method of Sale and Uniform Engine Fuels and Lubricants sections of NIST Handbook 130. A regulator from Kansas asked if since we already have the section for fuels and lubricants, why not put the method of sale into that section. A state regulator from Missouri commented that almost all states adopt the method of sale section and having method of sale for fuels in that section would allow maximum adoption of uniform methods. The CWMA recommended that this be a Voting item. At the 2018 CWMA they heard from the submitter that this item is being submitted to the FALS for further development. The CWMA recommended this as an Assigned item.

At the 2017 NEWMA Interim Meeting, Ms. Rebecca Richardson presented the proposal on behalf of Mr. Corr regarding the group of items (2302-3, 2302-6, 2302-8, 2307-1, 2307-3, 2307-6 and 2307-7). Mr. Ross Andersen (retired New York regulator) commented that it is not appropriate to put any items in the method of sale regulations that does not deal with declaring the unit of measure for what is being sold. All other items should appear in the Uniform Engine Fuels and Automotive Lubricants Regulation of NIST Handbook 130. Several state regulators concurred with this statement. A regulator from Connecticut believed some states that do not adopt both regulations. Another state regulator commented that even if the regulation was in both sections, a state would have to legislate promulgation and authority to enforce the statute. A state regulator commented that in general NIST Handbook 130 references "current version of ASTM", and the FTC Fuel Rating Rule, 16 CFR 306, which references specific older versions of ASTM standards. He is wondering which version NCWM is following. This language appears in Item 2302-8. He is wondering which version NCWM is following. After considerable discussion, the Committee recommends withdrawing Items 2302-3, 2302-6, 2302-8, 2307-3, 2307-6 and 2307-7 because the language in NIST Handbook 130, Method of Sale serves a different and distinct function from Uniform Engine Fuels and Automotive Lubricants Regulation. Since Item 2307-1 provides only definitions that are useful and relevant for both NIST HB 130 sections, Item 2307-1 is recommended as a voting item. Comments specific to Items 2301-1 and 2307-6 are that FALS revisit language regarding Internal Revenue Service (IRS) code and other potential agency conflicts if the item moves forward. NEWMA recommended that this item be Withdrawn.

At the 2018 NEWMA Annual Meeting, Mr. Corr gave an update and stated that an updated proposal should be available before the fall 2018 regional meetings. Mr. Mike Sikula (New York) asked if signage provisions listed in this item for kerosene were consistent with other products, he did not think it was. NEWMA recommends that the item remain as Assigned.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to **www.ncwm.net/meetings/annual/publication-16** to review these documents.

ITEM BLOCK 3 (B3) GASOLINE-OXYGENATE BLENDS AND FLEX-FUEL BLENDS

(This block was Adopted)

B3: MOS-4	VC	Section 2.20 Gasoline – Oxygenate Blends and Section 2.30. Ethanol Flex-Fuel
B3: FLR-5	VC	Section 3.28. EPA Labeling Requirements Also Apply and Section 3.8 Ethanol Flex Fuel

Source:
KMoore Consulting, LLC (2017)

Purpose:
Align the duplicative labeling wording for Gasoline-Oxygenate Blends and Ethanol Flex Fuel blends that appears in NIST Handbook 130, Section B: Uniform Regulation for the Method of Sale of Commodities with the proposed Section G. Ethanol labeling being proposed by the Handbook 130 Focus Group.

B3: MOS-4 VC Section 2.20. Gasoline – Oxygenate Blends and Section 2.30. Ethanol Flex-Fuel

Item under Consideration:
Amend NIST Handbook 130, Uniform Method of Sale of Commodities Regulation as follows:

2.20. Gasoline-Oxygenate Blends.

2.20.1. Method of Retail Sale. – Type of Oxygenate must be Disclosed. – All automotive gasoline or automotive gasoline-oxygenate blends kept, offered, or exposed for sale, or sold at retail containing at least 1.5 mass percent oxygen shall be identified as "with" or "containing" (or similar wording) the predominant oxygenate in the engine fuel. For example, the label may read "contains ethanol" or "with MTBE." The oxygenate contributing the largest mass percent oxygen to the blend shall be considered the predominant oxygenate. Where mixtures of only ethers are present, the retailer may post the predominant oxygenate followed by the phrase "or other ethers" or alternatively post the phrase "contains MTBE or other ethers." In addition, gasoline-methanol blend fuels containing more than 0.15 mass percent oxygen from methanol shall be identified as "with" or "containing" methanol. This information shall be posted on the upper 50 % of the dispenser front panel in a position clear and conspicuous from the driver's position in a type at least 12.7 mm (½ in) in height, 1.5 mm ($^1/_{16}$ in) stroke (width of type).

(Amended 1996)

2.20.2. Documentation for Dispenser Labeling Purposes. – The retailer shall be provided, at the time of delivery of the fuel, on product transfer documents such as an invoice, bill of lading, shipping paper, or other documentation:

(a) Information that complies with 40 CFR 80 1503 when the fuel contains ethanol.

(b) For fuels that do not contain ethanol, information that complies with 40 CFR 80.1503 and a declaration of the predominant oxygenate or combination of oxygenates present in concentrations sufficient to yield an oxygen content of at least 1.5 mass percent in the fuel. Where mixtures of only ethers are present, the fuel supplier may identify either the predominant oxygenate in the fuel (i.e., the oxygenate contributing the largest mass percent oxygen) or alternatively, use the phrase "contains MTBE or other ethers."

(c) Gasoline containing more than 0.15 mass percent oxygen from methanol shall be identified as "with" or "containing" methanol.

(Added 1984) (Amended 1985, 1986, 1991, 1996, and 2014)

2.20.3. EPA Labeling Requirements. – Retailers and wholesale purchaser-consumers of gasoline shall comply with the EPA pump labeling requirements for gasoline containing greater than 10 volume percent (v%) up to 15 volume percent (v%) ethanol (E15) under 40 CFR 80.1501 (for additional information refer to Section 2.30.2. FTC Labeling Requirements).

(Added 2018)

2.30. Ethanol Flex Fuel.

2.30.1. How to Identify Ethanol Flex Fuel. – Ethanol flex fuel shall be identified as "Ethanol Flex Fuel or EXX Flex Fuel."

2.30.2. FTC Labeling Requirements.

(a) Ethanol flex fuel **shall be identified and labeled in accordance with Federal Trade Commission Automotive Fuel Ratings, Certification and Posting Rule, 16 CFR, as amended** ~~**with an ethanol concentration no less than 51 and no greater than 83 volume percent shall be labeled "Ethanol Flex Fuel, minimum 51 % ethanol.**~~" **(for additional information refer to Section 2.20.3. EPA Labeling Requirements).**

(Amended 2014 **and 2018)**

~~**(b) Ethanol flex fuel with an ethanol concentration less than or equal to 50 volume percent shall be labeled "EXX Flex Fuel, minimum YY % ethanol," where the XX is the target ethanol concentration in volume percent and YY is XX minus five (− 5). The actual ethanol concentration of the fuel shall be XX volume percent plus or minus five (± 5) volume percent.**~~

~~**(Added 2014)**~~

~~**(c) A label shall be posted which states "For Use in Flexible Fuel Vehicles (FFV) Only." This information shall be clearly and conspicuously posted on the upper 50 % of the dispenser front panel in a type at least 12.7 mm (½ in) in height, 1.5 mm (1/16 in) stroke (width of type). A label shall be posted which states, "CHECK OWNERS MANUAL," and shall not be less than 6 mm (¼ in) in height by 0.8 mm (1/32 in) stroke; block style letters and the color shall be in definite contrast to the background color to which it is applied.**~~
~~**(Amended 2014)**~~

(Added 2007**)** (Amended 2014 **and 2018**)

B3: FLR-5 VC Section 3.28. EPA Labeling Requirements ~~Also Apply~~ and Section 3.8. Ethanol Flex Fuel

Source:
KMoore Consulting LLC (2017)

Purpose:
Align the ethanol labeling language with the recently released Federal Trade Commission updates to 16 CFR 306 on the Automotive Fuel Rating Rule as it pertains to ethanol fuel blend rating, labeling on retail dispensers, certification and recordkeeping requirements.

Item under Consideration:
Amend NIST Handbook 130, Uniform Engine Fuels and Automotive Lubricants Regulation as follows:

3.2.8. EPA Labeling Requirements ~~**Also Apply**~~ – Retailers and wholesale purchaser-consumer of gasoline shall comply with the EPA pump labeling requirements for gasoline containing greater than 10 volume percent (v%) up to 15 volume percent (V%) ethanol (E15) under 40 CFR 80.1501 **(for additional information refer to Section 3.8.2. FTC Labeling Requirements).**

(Amended 2018)

3.8. Ethanol Flex Fuel.

3.8.1. How to Identify Ethanol Flex Fuel. – Ethanol flex fuel shall be identified as Ethanol Flex Fuel or EXX Flex Fuel.

3.8.2. FTC Labeling Requirements.

(a) Ethanol flex fuel ~~**with an ethanol concentration no less than 51 and no greater than 83 volume percent shall be labeled "Ethanol Flex Fuel, minimum 51 % ethanol."**~~ **shall be identified and**

labeled in accordance with the Federal Trade Commission, Automotive Fuel Ratings, Certification and Posting, 16 CFR 306, as amended (for additional information refer to Section 3.2.6. EPA Labeling Requirements).

(Amended 2018)

~~**(b) Ethanol flex fuel with an ethanol concentration less than or equal to 50 volume percent shall be labeled "EXX Flex Fuel, minimum YY % ethanol," where the XX is the ethanol concentration in volume percent and YY is XX minus five (− 5). The actual ethanol concentration of the fuel shall be XX volume percent plus or minus five (± 5) volume percent.**~~

~~**(Added 2014)**~~

~~**(c) A label shall be posted which states "For Use in Flexible Fuel Vehicles (FFV) Only." This information shall be clearly and conspicuously posted on the upper 50 % of the dispenser front panel in a type at least 12.7 mm (. in) in height, 1.5 mm (1/16 in) stroke (width of type). A label shall be posted which states, "CHECK OWNER'S MANUAL," and shall not be less than 6 mm (. in) in height by 0.8 mm (1/32 in) stroke; block style letters and the color shall be in definite contrast to the background color to which it is applied.**~~

(Amended 2007, 2008, ~~**and**~~ 2014, **and 2018**)

Background/Discussion:

(This item appeared on the 2017 Fall regional reports as Items 2302-7and 2307-2. On the 2018 NCWM Interim and Annual Reports they appear as Block 3 (B3): B3-MOS-4 and B3: FLR-5.)

The proposal to eliminate the duplicative wording that appears in NIST Handbook 130, Method of Sale for Commodities will streamline the contents. Users will have one section that provides appropriate guidance on labeling for both oxygenated fuels and ethanol flex fuels. Having duplicative wording is both confusing and redundant. There is no other fuel related guidance, for gasoline or diesel for that matter, that appears in the NIST Handbook 130, Method of Sale of Commodities. All fuel related information appears in NIST Handbook 130, Uniform Engine Fuels and Automotive Lubricants Regulation.

At the 2017 NCWM Interim Meeting, Dr. Curran (FALS Chair) remarked that FALS will be submitting modified language to the L&R Committee. Several states and stakeholders supported this amendment. There was a remark that the FTC rule references EPA but does not require it to be followed. The Committee moved this forward as a Voting item.

At the 2017 NCWM Annual Meeting, Dr. Curran informed membership that the FALS met Sunday, July 16 for a work session. There was extensive discussion and comment on this item. FALS was unable to achieve consensus on the language under consideration in Publication 16. The issues at hand is the conflicting regulations between two federal agencies. FTC has labeling requirements have fewer elements to their language. The Committee noted that Section 2.30.1. was reflected as being stricken in the written report, this is not accurate and was corrected editorially. The Committee reviewed the following alternatives.

1) Making the item Informational and sending it back to the FALS for further consideration and review.

2) Move the item forward as it published in Publication 16 (2017).

3) Move the item forward with proposed amendments submitted by API.

4) Move the item forward with alternative language proposed by Committee member, Michelle Wilson (Arizona) and Tim Elliot (Washington state regulator.)

The Committee agreed to add a cross reference for clarity to Section 2.20.3. EPA Labeling Requirements Also Apply and Section 2.30.2. Labeling Requirements. The modified change was moved forward on the addendum sheet for a

Vote. In response to a motion made during the voting session, the Committee reconsidered this item and agreed to withdraw its recommendation for adoption and removed it from the voting agenda. It was believed that the amended proposal was substantially different than the version that was published in the Committee's Agenda. The amended proposal will be returned to the Committee's agenda.

At the 2018 NCWM Interim Meeting Bill Striejewske (FALS Chairman) commented that FALS discussed a new amendment proposed by Michelle Wilson. The FALS Committee recommended moving this modified language as a voting item. Comments received from regulators and industry alike supported moving Ms. Wilson's amendment forward as a voting item. PMAA supported this item; however, noted that there is a bigger issue that needs to be addressed regarding labeling and marketing of ethanol-containing fuels. The L&R Committee has recommended that modified language move forward as a Voting item.

At the 2018 NCWM Annual Meeting Bill Striejewske (FALS Chairman) commented that FALS believes this is fully develop. Mr. Jose Sorena (Chevron) remarked that a complete reference number to the CFR should be made to the item under consideration. The Committee reviewed and modified Block 3 to read CFR 306 in Section 2.302.a. FTC Labeling Requirements. Mr. Kurt Floren (Los Angeles County, CA) remarked that the word Rule should be consistent throughout the block. With the adoption of Item FLR-9 editorial privileges are granted if renumbering of items occur.

Regional Association Comments:

At the 2017 WWMA Annual Meeting there was lack of consensus from industry testimony. The Committee believes the best approach for further consideration of this item is to refer this item to FALS. The WWMA recommended that it be an Informational item.

At the 2017 SWMA Annual Meeting, Mr. Russ Lewis (speaking on behalf of API) remarked that the modifications simply point out the fact that the EPA requires their labeling for any fuel containing between 10 % and 15 % volume ethanol. Additionally, the proposed modifications point out a discrepancy between EPA and FTC categorization on E15 fuels.

The latest guidance from US EPA on the issue of using Flex-Fuel labeling to sell E15 was published in the FRN within the preamble to the proposed rule update for renewable fuels. The proposed rule is published here: **www.federalregister.gov/documents/2016/11/16/2016-25292/renewables-enhancement-and-growth-support-rule.** Mr. Lewis submitted supporting documents to the SWMA L&R. These documents will be forwarded to NCWM for posting under supporting documents. Several comments were heard but there was no consensus as how to proceed. The SWMA is recommending that this be returned to FALS for additional work.

At the 2017 CWMA Interim Meeting, Ms. Kristy Moore (K. Moore Consulting) commented that she strongly opposes the current language and is willing to submit a new Form 15 for the Committee and FALS to consider. Among comments heard, an industry representative commented that this item is intended to provide certainty in the market place, and a growing number of consumers are driving vehicles they do not own and are reliant on clear fuel distinctions at the pump. After hearing the comments during L&R Open Hearings, the Committee feels that the most efficient way to further vet this issue is through FALS. Consequently, the CWMA recommends this item remain Informational. At the 2018 CWMA Annual Meeting, Mr. Stutesman (Kansas) supported this item as written. Ms. Lori Jacobsen (South Dakota) reviewed revisions and stressed how minor details within a proposal can change the meaning and implementation of language as it eventually appears in the handbooks. The CWMA recommends this as a Voting item.

At the 2017 NEWMA Interim Meeting, the L&R Chairman read comments from the submitter, Kristy Moore stating her opposition to the changes and prefers that it be referred to FALS or be withdrawn. A New York regulator commented that this item is directed at ethanol flex fuel but is also referencing 16 CFR 306. The definitions are not the same. NEWMA recommended this item be referred back to FALS for further development and Informational status. At the 2018 NEWMA Annual Meeting, no comments were heard and CWMA believes this item is ready for a vote.

ITEM BLOCK 4 (B4) GASOLINE AND GASOLINE WITH ETHANOL

(This block was Withdrawn)

NOTE: This blocked item is how the language appeared in Publication 16 (2018). With the adoption of FLR-9 on this agenda, some of the language within the block is as changed.

B4: MOS-5	W	Section 2.20. Gasoline – Oxygenate Blends and X.X. Automotive Gasoline.
B4: FLR-6	W	Sections 1. Definitions, Section 2. Standard Fuel Specification, Section 3. Classification and Method of Sale of Petroleum Products

Source:
Archer Daniels Midland Corporation (2018)

Purpose:
Harmonize the method of sale information related to gasoline, with and without ethanol, in NIST Handbook 130, Uniform Regulation for the Method of Sale of Commodities with the information in the Uniform Engine Fuels and Automotive Lubricants Regulation. Harmonize terminology in NIST Handbook 130 related to ethanol containing fuels with federal regulations and add references to federal regulations in the Uniform Engine Fuels and Automotive Lubricants Regulation.

B4: MOS-5 W ~~Section 2.20. Gasoline – Oxygenate Blends~~ and X.X. Automotive Gasoline.

Item under Consideration:
Amend NIST Handbook 130, Uniform Method of Sale of Commodities Regulation as follows:

~~2.20. Gasoline-Oxygenate Blends.~~

~~2.20.1. Method of Retail Sale. – Type of Oxygenate must be Disclosed. – All automotive gasoline or automotive gasoline-oxygenate blends kept, offered, or exposed for sale, or sold at retail containing at least 1.5 mass percent oxygen shall be identified as "with" or "containing" (or similar wording) the predominant oxygenate in the engine fuel. For example, the label may read "contains ethanol" or "with MTBE." The oxygenate contributing the largest mass percent oxygen to the blend shall be considered the predominant oxygenate. Where mixtures of only ethers are present, the retailer may post the predominant oxygenate followed by the phrase "or other ethers" or alternatively post the phrase "contains MTBE or other ethers." In addition, gasoline-methanol blend fuels containing more than 0.15 mass percent oxygen from methanol shall be identified as "with" or "containing" methanol. This information shall be posted on the upper 50 % of the dispenser front panel in a position clear and conspicuous from the driver's position in a type at least 12.7 mm (½ in) in height, 1.5 mm ($^{1}/_{16}$ in) stroke (width of type).~~

~~(Amended 1996)~~

~~2.20.2. Documentation for Dispenser Labeling Purposes. – The retailer shall be provided, at the time of delivery of the fuel, on product transfer documents such as an invoice, bill of lading, shipping paper, or other documentation:~~

~~(a) Information that complies with 40 CFR 80.1503 when the fuel contains ethanol.~~

~~(b) For fuels that do not contain ethanol, information that complies with 40 CFR 80.1503 and a declaration of the predominant oxygenate or combination of oxygenates present in concentrations sufficient to yield an oxygen content of at least 1.5 mass percent in the fuel. Where mixtures of only ethers are present, the fuel supplier may identify either the predominant oxygenate in the fuel (i.e., the oxygenate contributing the largest mass percent oxygen) or alternatively, use the phrase "contains MTBE or other ethers."~~

~~(e) Gasoline containing more than 0.15 mass percent oxygen from methanol shall be identified as "with" or "containing" methanol.~~

~~(Added 1984) (Amended 1985, 1986, 1991, 1996, and 2014)~~

X.X. Automotive Gasoline.

X.X.X. How to Identify Gasoline. – All fuels sold as Gasoline shall be identified as Gasoline along with the grade name and automotive fuel rating.

X.X.X. Posting of Antiknock Index Required. – All automotive gasoline shall post the antiknock index in accordance with applicable regulations, 16 CFR 306 issued pursuant to the Petroleum Marketing Practices Act, as amended.

X.X.X. When the Term "Leaded" May be Used. – The term "leaded" shall be used only when the fuel meets specification requirements of Section 2.1.5. Minimum Lead Content to be Termed "Leaded."

X.X.X. Use of Lead Substitute Must be Disclosed. – Each dispensing device from which gasoline containing a lead substitute is dispensed shall display the following legend: "Contains Lead Substitute." The lettering of this legend shall not be less than 12.7 mm (½ in) in height and the color of the lettering shall be in definite contrast to the background color to which it is applied.

X.X.X. Nozzle Requirements for Leaded Fuel. – Each dispensing device from which gasoline that contain lead in amounts sufficient to be considered "leaded" gasoline, or lead substitute engine fuel, is sold shall be equipped with a nozzle spout having a terminal end with an outside diameter of not less than 23.63 mm (0.930 in). (See 40 CFR 80.24)

X.X.X. Prohibition of Terms. – It is prohibited to use specific terms to describe a grade of gasoline unless it meets the minimum antiknock index requirement shown in Table #. Minimum Antiknock Index Requirements.

Table #.
Minimum Antiknock Index Requirements

	Minimum Antiknock Index	
Term	**ASTM D4814 Altitude Reduction Areas IV and V**	**All Other ASTM D4814 Areas**
Premium, Super, Supreme, High Test	**90**	**91**
Midgrade, Plus	**87**	**89**
Regular Leaded	**86**	**88**
Regular, Unleaded (alone)	**85**	**87**
Economy	**--**	**86**

X.X.X. Method of Retail Sale. – For oxygenated gasoline, the type of Oxygenate must be disclosed. All automotive gasoline kept, offered, or exposed for sale, or sold at retail containing at least 1.5 mass percent oxygen shall be identified as "with" or "containing" (or similar wording) the predominant oxygenate in the engine fuel. For example, the label may read "contains ethanol" or "with methyl *tertiary*-butyl ether (MTBE)." The oxygenate contributing the largest mass percent oxygen to the blend shall be considered the predominant oxygenate. Where mixtures of only ethers are present, the retailer

may post the predominant oxygenate followed by the phrase "or other ethers" or alternatively post the phrase "contains MTBE or other ethers." In addition, gasoline-methanol blend fuels containing more than 0.15 mass percent oxygen from methanol shall be identified as "with" or "containing" methanol. This information shall be posted on the upper 50 % of the dispenser front panel in a position clear and conspicuous from the driver's position in a type at least 12.7 mm (½ in) in height, 1.5 mm ($^{1}/_{16}$ in) stroke (width of type).

X.X.X. Documentation for Dispenser Labeling Purposes. – The retailer shall be provided, at the time of delivery of the fuel, on product transfer documents such as an invoice, bill of lading, shipping paper, or other documentation:

(a) Information that compiles with 40 CFR 80.1503 when the fuel contains ethanol.

(b) For fuels that do not contain ethanol, information that complies with 40 CFR 80.1503 and a declaration of the predominant oxygenate or combination of oxygenates present in concentrations sufficient to yield an oxygen content of at least 1.5 mass percent in the fuel. Where mixtures of only ethers are present, the fuel supplier may identify either the predominant oxygenate in the fuel (i.e., the oxygenate contributing the largest mass percent oxygen) or alternatively, use the phrase "contains MTBE or other ethers."

(c) Gasoline containing more than 0.15 mass percent oxygen from methanol shall be identified as "with" or "containing" methanol.

(d) A certification of the automotive fuel rating. (refer to 16 CFR 306.6)

X.X.X. EPA Labeling Requirements Also Apply. – Retailers and wholesale purchaser-consumers of gasoline shall comply with the EPA pump labeling requirements for gasoline containing greater than 10 volume percent (v%) up to 15 volume percent (v%) ethanol (E15) under 40 CFR 80.1501.

(Amended 20XX)

B4: FLR-6 A Sections 1. Definitions, Section 2. Standard Fuel Specification, Section 3. Classification and Method of Sale of Petroleum Products

Item under Consideration:
Amend NIST Handbook 130, Uniform Engine Fuels and Automotive Lubricants Regulation as follows:

Section 1. Definitions

1.5. Automotive Gasoline~~, Automotive Gasoline-Oxygenate Blend~~. – A type of fuel**, which may or may not contain oxygenates**, suitable for use in spark-ignition automobile engines and also commonly used in marine and non-automotive applications. **(Refer to 40 CFR 80.2(c) and 16 CFR 306.0(i)(1))**

(Amended 20XX)

~~**1.8. Base Gasoline. – All components other than ethanol in a blend of gasoline and ethanol.**~~

1.13. Denatured Fuel Ethanol. – An ethanol blend component for use in gasoline ~~-ethanol blends~~ and ethanol flex fuel. The ethanol is rendered unfit for beverage use by the addition of denaturants under formulas approved by the Alcohol and Tobacco Tax and Trade Bureau (TTB) (**www.ttb.gov**), ~~**by the latest version of ASTM D4806, "Standard Specification for Denatured Fuel Ethanol for Blending with Gasolines for Use as Automotive Spark Ignition Engine Fuel" describes the acceptable denaturants for denatured fuel ethanol to be blended into spark ignition engine fuels**~~. **(refer to 27 CFR 19 and 21 and 40 CFR 80.2[vvv])**

(Amended 2014 **and 20XX**)

1.20. Ethanol. – Also known as "ethyl alcohol." Ethanol is provided in gasoline~~**-ethanol blends**~~ by blending denatured fuel ethanol. See Section 1.13. Denatured Fuel Ethanol.

(Amended 2014 **and 20XX**)

1.21. Ethanol Flex Fuel. – Blends of ethanol and hydrocarbons**, containing more than 10 percent but not greater than 83 percent ethanol by volume,** restricted for use as fuel in ground vehicles equipped with flexible-fuel spark-ignition engines. **(refer to 16 CFR 306.0[o]**)

(Amended 2014 **and 20XX**)

1.24. Gasoline. – A volatile mixture**, which may or may not contain oxygenates,** ~~**of liquid hydrocarbons**~~ generally containing small amounts of additives suitable for use as a fuel in a spark-ignition internal combustion engine. **(refer to 40 CFR 80.2(c) and 16 CFR 306.0(i)(1))**

(Amended 20XX)

~~**1.25. Gasoline-Alcohol Blend. – A fuel consisting primarily of gasoline and a substantial amount (more than 0.35 mass percent of oxygen, or more than 0.15 mass percent of oxygen if methanol is the only oxygenate) of one or more alcohols.**~~

1.28. Oxygenated Gasoline~~-Oxygenate Blend~~. – A ~~**fuel consisting primarily of**~~ gasoline **containing a measurable amount** ~~**along with a substantial amount**~~ (more than 0.35 mass percent of oxygen, or more than 0.15 mass percent of oxygen if methanol is the only oxygenate) of one or more oxygenates. **(refer to 40 CFR 80.2[rr])**

(Amended 20XX)

1.34. Lead Substitute Engine Fuel. – For labeling purposes, a gasoline ~~**or gasoline-oxygenate blend**~~ that contains a "lead substitute".

(Amended 20XX)

1.35. Leaded. – For labeling purposes, any gasoline ~~**or gasoline-oxygenate blend**~~ which contains more than 0.013 g of lead per liter (0.05 g lead per U.S. gal). ***NOTE:*** *EPA defines leaded fuel as one which contains more than 0.0013 g of phosphorus per liter (0.005 g per U.S. gal), or any fuel to which lead or phosphorus is intentionally added.*

(Amended 20XX)

1.48. Reformulated Gasoline (RFG). – A gasoline ~~**or gasoline-oxygenate blend**~~ certified to meet the specifications and emission reduction requirements established by the Clean Air Act Amendments of 1990, as amended by the Energy Policy Act of 2005, required to be sold for use in automotive vehicles in extreme and severe ozone nonattainment areas and those areas which opt to require reformulated gasoline. **(refer to 40 CFR 80.2[ee])**

(Amended 2008 **and 20XX**)

1.53. Unleaded. – When used in conjunction with "engine fuel" or "gasoline" means any gasoline ~~**or gasoline-oxygenate blend**~~ to which no lead or phosphorus compounds have been intentionally added and which contains not more than 0.013 g of lead per liter (0.05 g lead per U.S. gallon) and not more than 0.0013 g of phosphorus per liter (0.005 g phosphorus per U.S. gallon). **(refer to 40 CFR 80.2[g])**

(Amended 20XX)

Section 2. Standard ~~Fuel~~ Specifications

2.1. Gasoline ~~and Gasoline-Oxygenate Blends~~.

2.1.1. Gasoline ~~**and Gasoline-Oxygenate Blends**~~ (as defined in this regulation)**.** – Shall meet the latest version of ASTM D4814, "Standard Specification for Automotive Spark-Ignition Engine Fuel" ~~**except for the permissible offsets for ethanol blends as provided in Section 2.1.2. Gasoline-Ethanol Blends.**~~

(Added 2009)**(Amended 20XX**)

2.1.2. Gasoline containing Ethanol~~-Ethanol Blends~~. – When gasoline **contains** ~~**is blended with**~~ ethanol, the ethanol shall meet the latest version of ASTM D4806, "Standard Specification for Denatured Fuel Ethanol for Blending with Gasolines for Use as Automotive Spark-Ignition Engine Fuel," ~~**and the blend shall meet the latest version of ASTM D4814, "Standard Specification for Automotive Spark-Ignition Engine Fuel," with the following permissible exceptions:**~~

~~**(a) The maximum vapor pressure shall not exceed the ASTM D4814 limits by more than:**~~

~~**(1) 1.0 psi for blends containing 9 to 10 volume percent ethanol from June 1 through September 15.**~~

~~**(2) 1.0 psi for blends containing one or more volume percent ethanol for volatility classes A, B, C, D from September 16 through May 31.**~~

~~**(3) 0.5 psi for blends containing one or more volume percent ethanol for volatility Class E from September 16 through May 31.**~~

~~**The vapor pressure exceptions in subsections 2.1.2. Gasoline-Ethanol Blends will remain in effect until May 1, 2017, or until ASTM incorporates changes to the vapor pressure maximums for ethanol blends, whichever occurs earlier. (Effective July 28, 2016)**~~

(Amend 2016 **and 20XX**)

~~***NOTE 1: The temperature values (e.g., 54 °C, 50. °C, 41.5 °C) are presented in the format prescribed in ASTM E29 "Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications."***~~

~~***NOTE 2: The values shown above appear only in U.S. customary units to ensure that the values are identical to those in ASTM standards and the Environmental Protection Agency regulation.***~~

(Added 2009) (Amended 2012**,** ~~**and**~~ 2016 **and 20XX**)

2.1.3. Minimum Antiknock Index (AKI). – The AKI shall not be less than the AKI posted on the product dispenser or as certified on the invoice, bill of lading, shipping paper, or other documentation; **(refer to 16 CFR 306)**

(Amended 20XX)

2.1.4. Minimum Motor Octane Number. – The minimum motor octane number shall not be less than 82 for gasoline with an AKI of 87 or greater;

2.1.5. Minimum Lead Content to Be Termed "Leaded." – Gasoline ~~**and gasoline oxygenate blends**~~ sold as "leaded" shall contain a minimum of 0.013 g of lead per liter (0.05 g per U.S. gallon)

(Amended 20XX)

2.1.6. Lead Substitute Gasoline. – Gasoline ~~**and gasoline-oxygenate blends**~~ sold as "lead substitute" gasoline shall contain a lead substitute which provides protection against exhaust valve seat recession equivalent to at least 0.026 g of lead per liter (0.10 g per U.S. gallon). **(Amended 20XX)**

2.1.6.1. Documentation of Exhaust Valve Seat Protection. – Upon the request of the Director, the lead substitute additive manufacturer shall provide documentation to the Director that demonstrates that the treatment level recommended by the additive manufacturer provides protection against exhaust valve seat recession equivalent to or better than 0.026 g/L (0.1 g/gal) lead. The Director may review the documentation and approve the lead substitute additive before such additive is blended into gasoline. This documentation shall consist of:

(a) test results as published in the Federal Register by the EPA Administrator as required in Section 211(f)(2) of the Clean Air Act; or

(b) until such time as the EPA Administrator develops and publishes a test procedure to determine the additive's effectiveness in reducing valve seat wear, test results and description of the test procedures used in comparing the effectiveness of 0.026 g per liter lead and the recommended treatment level of the lead substitute additive shall be provided.

2.1.7. Blending. – Leaded, lead substitute, and unleaded **oxygenated** gasoline-~~**oxygenate blends**~~ shall be blended according to the EPA "substantially similar" rule or an EPA waiver for unleaded fuel.

(Amended 2009 **and 20XX**)

2.7. Denatured Fuel Ethanol. – Intended for **a blend component for gasoline** ~~**blending with gasoline**~~ shall meet the latest version of ASTM D4806, "Standard Specification for Denatured Fuel Ethanol for Blending with Gasolines for Use as Automotive Spark-Ignition Engine Fuel."

(Amended 2014 **and 20XX**)

Section 3. Classification and Method of Sale of Petroleum Products

3.2. Automotive Gasoline ~~and Automotive Gasoline-Oxygenate Blends~~.

3.2.1. How to Identify Gasoline. – All fuels sold as Gasoline shall be identified as Gasoline along with the grade name and automotive fuel rating.

3.2.~~1~~2. Posting of Antiknock Index Required. – All automotive gasoline ~~**and automotive gasoline-oxygenate blends**~~ shall post the antiknock index in accordance with applicable regulations, 16 CFR 306 issued pursuant to the Petroleum Marketing Practices Act, as amended.

(Amended 20XX)

3.2.~~2~~3. When the Term "Leaded" May be Used. – The term "leaded" shall be used only when the fuel meets specification requirements of paragraph 2.1.5. Minimum Lead Content to be Termed "Leaded."

3.2.~~3~~4. Use of Lead Substitute Must be Disclosed. – Each dispensing device from which gasoline ~~**or gasoline-oxygenate blends**~~ containing a lead substitute is dispensed shall display the following legend: "Contains Lead Substitute." The lettering of this legend shall not be less than 12.7 mm (½ in) in height and the color of the lettering shall be in definite contrast to the background color to which it is applied.

(Amended 20XX)

3.2.~~4~~5. Nozzle Requirements for Leaded Fuel. – Each dispensing device from which gasoline ~~**or gasoline-oxygenate blends**~~ that contain lead in amounts sufficient to be considered "leaded" gasoline, or lead substitute engine fuel, is sold shall be equipped with a nozzle spout having a terminal end with an outside diameter of not less than 23.63 mm (0.930 in) **(refer to 40 CFR 80.24).**

(Amended 20XX)

3.2.~~5~~6. Prohibition of Terms. – It is prohibited to use specific terms to describe a grade of gasoline ~~**or gasoline-oxygenate blend**~~ unless it meets the minimum antiknock index requirement shown in Table 1. Minimum Antiknock Index Requirements.

Table 1: Minimum Antiknock Index Requirements		
	Minimum Antiknock Index	
Term	**ASTM D4814 Altitude Reduction Areas IV and V**	**All Other ASTM D4814 Areas**
Premium, Super, Supreme, High Test	90	91
Midgrade, Plus	87	89
Regular Leaded	86	88
Regular, Unleaded (alone)	85	87
Economy	--	86

(Table 1. Amended 1997) **(Amended 20XX)**

3.2.~~6~~7. Method of Retail Sale. – ~~**Type**~~ **For oxygenated gasoline the type** of Oxygenate must be disclosed. All automotive gasoline ~~**or automotive gasoline-oxygenate blends**~~ kept, offered, or exposed for sale, or sold at retail containing at least 1.5 mass percent oxygen shall be identified as "with" or "containing" (or similar wording) the predominant oxygenate in the engine fuel. For example, the label may read "contains ethanol" or "with methyl *tertiary*-butyl ether (MTBE)." The oxygenate contributing the largest mass percent oxygen to the blend shall be considered the predominant oxygenate. Where mixtures of only ethers are present, the retailer may post the predominant oxygenate followed by the phrase "or other ethers" or alternatively post the phrase "contains MTBE or other ethers." In addition, gasoline-methanol blend fuels containing more than 0.15 mass percent oxygen from methanol shall be identified as "with" or "containing" methanol. This information shall be posted on the upper 50 % of the dispenser front panel in a position clear and conspicuous from the driver's position in a type at least 12.7 mm (½ in) in height, 1.5 mm ($^{1}/_{16}$ in) stroke (width of type).

(Amended 1996 **and 20XX**)

3.2.~~7~~8. Documentation for Dispenser Labeling Purposes. – The retailer shall be provided, at the time of delivery of the fuel, on product transfer documents such as an invoice, bill of lading, shipping paper, or other documentation:

(a) Information that compiles with 40 CFR 80.1503 when the fuel contains ethanol.

(Added 2014)

(b) For fuels that do not contain ethanol, information that complies with 40 CFR 80.1503 and a declaration of the predominant oxygenate or combination of oxygenates present in concentrations sufficient to yield an oxygen content of at least 1.5 mass percent in the fuel. Where mixtures of only ethers are present, the fuel supplier may identify either the predominant oxygenate in the fuel (i.e., the oxygenate contributing the largest mass percent oxygen) or alternatively, use the phrase "contains MTBE or other ethers."

(Added 2014)

(c) Gasoline containing more than 0.15 mass percent oxygen from methanol shall be identified as "with" or "containing" methanol.

(Added 2014)

(d) A certification of the automotive fuel rating. (refer to 16 CFR 306.6)

(Added 20XX) (Amended 1996 **and 20XX**)

3.2.~~8~~9. EPA Labeling Requirements Also Apply. – Retailers and wholesale purchaser-consumers of gasoline shall comply with the EPA pump labeling requirements for gasoline containing greater than 10 volume percent (v%) up to 15 volume percent (v%) ethanol (E15) under 40 CFR 80.1501.

(Added 2012)**(Amended 20XX)**

Section 4. Retail Storage Tanks and Dispenser Filters

4.1. Water in Gasoline <u>containing ethanol</u>~~-Alcohol Blends~~, Biodiesel Blends, Ethanol Flex Fuel, Aviation Gasoline, and Aviation Turbine Fuel. – No water phase greater than 6 mm (¼ in) as determined by an appropriate detection paste or other acceptable means, is allowed to accumulate in any tank utilized in the storage of gasoline **<u>containing ethanol</u>**~~-alcohol blend~~, biodiesel, biodiesel blends, ethanol flex fuel, aviation gasoline, and aviation turbine fuel.

(Amended 2008, 2012,~~ and~~ 2014**<u>, and 20XX</u>**)

4.2. Water in Gasoline <u>not containing ethanol</u>, Diesel, ~~Gasoline-Ether,~~ and Other Fuels. – Water shall not exceed 25 mm (1 in) in depth when measured with water indicating paste or other acceptable means in any tank utilized in the storage of diesel, gasoline, gasoline-ether blends, and kerosene sold at retail except as required in Section 4.1. Water in Gasoline **<u>containing ethanol</u>**~~-Alcohol Blends,~~ Biodiesel Blends, Ethanol Flex Fuel, Aviation Gasoline, and Aviation Turbine Fuel.

(Amended 2008, 2012,~~ and~~ 2014**<u>, and 20XX</u>**)

4.3. Dispenser Filters.

4.3.1. Engine Fuel Dispensers.

(a) All gasoline, ~~**gasoline-alcohol blends, gasoline-ether blends,**~~ ethanol flex fuel, and M85 methanol dispensers shall have a 10 micron or smaller nominal pore-sized filter.

(b) All biodiesel, biodiesel blends, diesel, and kerosene dispensers shall have a 30 micron or smaller nominal pore-sized filter.

(Amended 2014 **<u>and 20XX</u>**)

Background/Discussion:

(These appeared on the 2017 Fall Regional reports as New Item 16 and New Item 17. On the 2018 NCWM Interim and Annual Reports they appear as Item Block 4 (B4), B4: MOS-5 and B4: FLR-6.)

The method of sale information in NIST Handbook 130 should be consistent with federal regulations and identical in the Method of Sale Regulation and the Engine Fuels and Automotive Lubricants Regulation. The information in the two sections is not the same and is inconsistent with federal regulations.

Terminology related to ethanol and fuels containing ethanol in NIST Handbook 130 is inconsistent with EPA and FTC definitions. This proposal would harmonize the related terminology in the handbook with the federal definitions.

Several comments have also been received that it would be helpful to add references to federal regulations in the handbook. This proposal included a number of these references.

U.S. Federal Regulations cited in proposals

<u>EPA REGULATIONS – 27 CFR 80</u>

§ 80.2 Definitions.

Definitions apply in this part as described in this section.

(c) *Gasoline* means any fuel sold in any State[1] for use in motor vehicles and motor vehicle engines, and commonly or commercially known or sold as gasoline.

[1]*State* means a State, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa and the Commonwealth of the Northern Mariana Islands.

(g) *Unleaded gasoline* means gasoline which is produced without the use of any lead additive and which contains not more than 0.05 gram of lead per gallon and not more than 0.005 gram of phosphorus per gallon.

(ee) *Reformulated gasoline* means any gasoline whose formulation has been certified under §80.40, and which meets each of the standards and requirements prescribed under §80.41.

(rr) *Oxygenated gasoline* means gasoline which contains a measurable amount of oxygenate.

(vvv) *Denatured fuel ethanol (DFE)* means an alcohol of the chemical formula C_2H_6O which contains a denaturant to make it unfit for human consumption, that is produced or imported for use in motor gasoline, and that meets the requirements of §80.1610.

(aaaa) *CBOB* means gasoline blendstock that could become conventional gasoline solely upon the addition of oxygenate.

§ 80.24 Controls applicable to motor vehicle manufacturers.

(b) The manufacturer of any motor vehicle equipped with an emission control device which the Administrator has determined will be significantly impaired by the use of gasoline other than unleaded gasoline shall manufacture such vehicle with each gasoline tank filler inlet having a restriction which prevents the insertion of a nozzle with a spout having a terminal end with an outside diameter of 0.930 inch (2.363 centimeters) or more and allows the insertion of a nozzle with a spout meeting the specifications of §80.22(f)(2).

FTC REGULATIONS – 16 CFR 306

§ 306.0 Definitions.

As used in this part:

(i) *Automotive fuel* means liquid fuel of a type distributed for use as a fuel in any motor vehicle, and the term includes, but is not limited to:

(1) Gasoline, an automotive spark-ignition engine fuel, which includes, but is not limited to, gasohol (generally a mixture of approximately 90 percent unleaded gasoline and 10 percent ethanol) and fuels developed to comply with the Clean Air Act, 42 U.S.C. 7401 *et seq.,* such as reformulated gasoline and oxygenated gasoline; and

(2) Alternative liquid automotive fuels, including, but not limited to:

(iii) Ethanol flex fuels;

(o) *Ethanol flex fuels* means a mixture of gasoline and ethanol containing more than 10 percent but not greater than 83 percent ethanol by volume.

§306.6 Certification.

In each transfer you make to anyone who is not a consumer, you must certify the automotive fuel rating of the automotive fuel consistent with your determination. You can do this in either of two ways:

(a) Include a delivery ticket or other paper with each transfer of automotive fuel. It may be an invoice, bill of lading, bill of sale, terminal ticket, delivery ticket, or any other written proof of transfer. It must contain at least these four items:

(1) Your name;

(2) The name of the person to whom the automotive fuel is transferred;

(3) The date of the transfer;

(4) The automotive fuel rating. Octane rating numbers may be rounded off to a whole or half number equal to or less than the number determined by you.

(b) Give the person a letter or other written statement. This letter must include the date, your name, the other person's name, and the automotive fuel rating of any automotive fuel you will transfer to that person from the date of the letter onwards. Octane rating numbers may be rounded to a whole or half number equal to or less than the number determined by you. This letter of certification will be good until you transfer automotive fuel with a lower automotive fuel rating, except that a letter certifying the fuel rating of biomass-based diesel, biodiesel, a biomass-based diesel blend, a biodiesel blend, or an ethanol flex fuel will be good only until you transfer those fuels with a different automotive fuel rating, whether the rating is higher or lower. When this happens, you must certify the automotive fuel rating of the new automotive fuel either with a delivery ticket or by sending a new letter of certification.

(c) When you transfer automotive fuel to a common carrier, you must certify the automotive fuel rating of the automotive fuel to the common carrier, either by letter or on the delivery ticket or other paper.

At the 2018 Interim Meeting, Mr. Striejewske (FALS Chairman) commented that the subcommittee discussed these agenda items during their meeting and had concerns about possible conflicts between these items and the Handbook 130 Informal Work Group efforts in Item FLR-9. Several regulators and industry members concurred that this item be moved forward as informational. Mr. Kristin Macey (California) commented that title referenced "Method of Sale of Commodities" and it should state "Uniform Engine Fuels and Automotive Regulations." The title has been changed to reflect this comment. Additionally, Allen Morrison (California) recommended adding the word "automotive" before gasoline in Section 4.3.1(a). This change has been made to align with other sections of the regulation. The L&R Committee recommended that this block be assigned to FALS for further development.

At the 2018 NCWM Annual Meeting, Mr. Chuck Corr withdrew this item.

Regional Association Comments:
At the 2017 WWMA Annual Meeting the Committee recommended this item move forward as Informational item and referred it to FALS for further development.

At the 2017 SWMA Annual Meeting, there were several comments heard that this item should proceed through FALS for development. In addition, the submitter commented this should go through FALS for harmonization and determination of proper terminology. The SWMA is recommending this be referred to FALS for additional consideration.

At the 2017 CWMA Interim Meeting the Committee supports the concept of this item and believes it should be further vetted through FALS. The CWMA recommended it be an Informational item. At the 2018 CWMA Annual Meeting, Mr. Corr (ADM) commented that this block will need further development through FALS.

At the 2017 NEWMA Interim Meeting, Mr. Ross Andersen (retired New York regulator) commented there is no method of sale in what is proposed for deletion, so he is not sure language should be included in this section. There is confusion between this item and its companion item (2302-5). A state regulator commented that these proposals are intended to harmonize NIST Handbook 130, Method of Sale Regulations with the Uniform Engine Fuel Regulations. The retired state regulator commented that these items should be split (Items 2302-5 and 2307-5). A state regulator commented the language "all fuel sold as gasoline should be identified as gasoline is circuitous". The Committee recommends the item be sent to FALS to clarify. The retired state regulator further commented this item should be separated from Item 2302-5 and proposes to amend the wrong section of NIST Handbook 130. NEWMA believes this item merits further consideration and should be referred to FALS. At the 2018 NEWMA Annual, Mr. Corr provided an updated indicating this item is assigned to FALS. They are currently reviewing all agenda items and definitions. There were several comments heard these items need to be renumbered and referenced to 16 CFR 306 and ASTM D4814 need to be reconciled and consistent. NEWMA recommends this remain at FALS for further development.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to **www.ncwm.net/meetings/annual/publication-16** to review these documents.

ITEM BLOCK 5 (B5) OBSOLETE MOTOR OILS

B5: MOS-6	A	Section 2.33. Oil
B5: FLR-7	A	Section 1.43. Motor Oil, 1.44. Racing Oil, 3.13. Oil, and 7.2. Reproducibility Limits

Source:
Independent Lubricant Manufacturers Association (ILMA) (2018)

Purpose:
Provide information to protect consumers from purchasing obsolete motor oils that can harm modern engines.

B5: MOS-6 A Section 2.33. Oil

Item under Consideration:
Amend NIST Handbook 130, Uniform Method of Sale of Commodities Regulation as follows:

2.33. Oil.

2.33.1. Labeling of Vehicle Engine (Motor) Oil. – Vehicle engine (motor) oil shall be labeled.

2.33.1.1. Viscosity Grade. – The label on any vehicle engine (motor) oil container, receptacle, dispenser, or storage tank, and any invoice or receipt from service on an engine that includes the installation of vehicle engine (motor) oil dispensed from a receptacle, dispenser, or storage tank, shall contain the viscosity grade classification preceded by the letters "SAE" in accordance with SAE International's latest version of SAE J300, "Engine Oil Viscosity Classification." **Containers used in retail trade (such as bottles, jugs, pails, drums) are explicitly targeted by this legislation. Where possible in the available space, invoices and receipts shall also display the SAE Viscosity Grade (see Note).**

2.33.1.1.1. Most modern engine oil specifications are for multigrade products, and their SAE viscosity grade must appear in the form SAE XXW-YY. The use of "SAE" and of the hyphen are mandatory. Containers used in retail trade (such as bottles, jugs, pails, drums) are explicitly targeted by this legislation.

2.33.1.1.2. Engine oils marketed under obsolete API Categories SA and SB shall not be described as multigrades.

NOTE: *If an invoice or receipt from service on an engine has limited room for identifying the viscosity, brand, and service category, then abbreviated versions of each may be used on the invoice or receipt and the letters "SAE" may be omitted from the viscosity classification.*

(Note added 2014)

(Amended 2014)

2.33.1.2. Brand. –The label on any vehicle engine (motor) oil container and the invoice or receipt from service on an engine that includes the installation of bulk vehicle engine (motor) oil dispensed from a receptacle, dispenser, or storage tank shall contain the name, brand, trademark, or trade name of the vehicle engine (motor) oil.

(Amended 2014)

Note: If an invoice or receipt from service on an engine has limited room for identifying the viscosity, brand, and service category, then abbreviated versions of each may be used on the invoice or receipt and the letters "SAE" may be omitted from the viscosity classification.

2.33.1.3. Engine Service Category. – The label on any vehicle engine (motor) oil container, receptacle, dispenser, or storage tank and the invoice or receipt from service on an engine that includes the installation of bulk vehicle engine (motor) oil dispensed from a receptacle, dispenser, or storage tank shall contain ~~the~~**at least one** engine service category, ~~**or categories,**~~ displayed in letters not less than 3.18 mm ($^{1}/_{8}$ in) in height, as defined by the latest version of SAE J183, "Engine Oil Performance and Engine Service Classification (Other than "Energy Conserving")," API Publication 1509, "Engine Oil Licensing and Certification System," European Automobile Manufacturers Association (ACEA), "European Oil Sequences," or other Vehicle or Engine Manufacturer standards as approved in Section 2.33.1.3.1. Vehicle or Engine Manufacturer Standard**. Containers used in retail trade (such as bottles, jugs, pails, drums) are explicitly targeted by this legislation.**

(Amended 2014 **and 20XX**)

2.33.1.3.1. Vehicle or Engine Manufacturer Standard. – The label on any vehicle engine (motor) oil container, receptacle, dispenser, or storage tank and the invoice or receipt from service on an engine that includes the installation of vehicle engine (motor) oil dispensed from a receptacle, dispenser, or storage tank shall identify the specific vehicle or engine manufacturer standard, or standards, met in letters not less than 3.18 mm ($^{1}/_{8}$ in) in height. If the vehicle (motor) oil only meets a**n active** vehicle or engine manufacturer standard, the label must clearly identify that the oil is only intended for use where specifically recommended by the vehicle or engine manufacturer. **Containers used in retail trade (such as bottles, jugs, pails, drums) are explicitly targeted by this legislation.**

(Added 2014**, Amended 20XX**)

2.33.1.3.2. Inactive or Obsolete Service Categories. – The label on any vehicle engine (motor) oil container, receptacle, dispenser, or storage tank and the invoice or receipt from service on an engine that includes the installation of bulk vehicle engine (motor) oil dispensed from a receptacle, dispenser, or storage tank shall bear a plainly visible cautionary statement in compliance with the latest version of SAE J183, Appendix A, whenever the vehicle engine (motor) oil in the container or in bulk does not meet an active API service category as defined by the latest version of SAE J183, "Engine Oil Performance and Engine Service Classification (Other than "Energy Conserving~~")." If a vehicle engine (motor) oil is identified as only meeting a vehicle or engine manufacturer standard, the labeling requirements in Section 2.33.1.3.1. Vehicle or Engine Manufacturer Standard applies.~~ **Marketing of engine oils corresponding to obsolete performance categories as defined in SAE J183 is expressly forbidden, except for antique vehicles requiring non-detergent motor oils corresponding to API Categories SA or SB. Marketers and/or Retailers of products corresponding to API performance categories SA and SB must take judicious steps to ensure that these products are targeted to the engines intended to receive these materials. Such steps should include confinement of these products away from retail shelves featuring engine oils meeting current performance categories. Containers used in retail trade (such as bottles, jugs, pails, drums) are explicitly targeted by this legislation. Beyond product controls, the minimum labeling standard for compliance with this requirement requires the marketer to print one of the following statements, in accordance with the Category claimed, in letters not less than 6.35 mm ($^{1}/_{4}$ in) in height on the front label of any product marketed under API categories SA and SB:**

(Amended 2014**, 20XX**)

2.33.1.3.2.a. API SA Category. – WARNING: THIS PRODUCT IS NOT SUITABLE FOR USE IN MOST GASOLINE-POWERED AUTOMOTIVE ENGINES BUILT AFTER 1930.

2.33.1.3.2.b. API SB Category: – WARNING: THIS PRODUCT IS NOT SUITABLE FOR USE IN MOST GASOLINE-POWERED AUTOMOTIVE ENGINES BUILT AFTER 1951.

2.33.1.3.3. In addition to the minimum labeling standard described in 2.33.1.3.2, marketers shall include the full language expressing Category obsolescence in the latest edition of SAE J183 at time of manufacture.

2.33.1.3.3.a. API SA engine oils should bear the following text on the rear label, in letters not less than 3.18 mm ($^1/_8$ in) in height:

CAUTION: THIS OIL IS RATED API SA. IT CONTAINS NO ADDITIVES. IT IS NOT SUITABLE FOR USE IN MOST GASOLINE-POWERED AUTOMOTIVE ENGINES BUILT AFTER 1930. USE IN MODERN ENGINES MAY CAUSE UNSATISFACTORY ENGINE PERFORMANCE OR EQUIPMENT HARM.

2.33.1.3.3.b. API SB engine oils should bear the following text on the rear label, in letters not less than 3.18 mm ($^1/_8$ in) in height:

CAUTION: THIS OIL IS RATED API SB AND IS NOT SUITABLE FOR USE IN MOST GASOLINE-POWERED AUTOMOTIVE ENGINES BUILT AFTER 1951. USE IN MORE MODERN ENGINES MAY CAUSE UNSATISFACTORY PERFORMANCE OR EQUIPMENT HARM.

2.33.1.3.4. Motorcycles, where wet clutches are present in the design, may not operate properly with highly friction-modified engine oils. As a result, motorcycle OEMs may recommend obsolete category oils in an attempt to avoid friction-modified formulations. Frequently, such recommendations are for "API SG" performance levels. All engine oils intended for the motorcycle market, claiming obsolete categories as defined within SAE J183, must be clearly identified "WARNING: FOR MOTORCYCLE USE ONLY" on the front label, in letters not less than 6.35 mm ($^1/_4$ in) in height.

2.33.1.3.5. If a vehicle engine (motor) oil is identified as only meeting a vehicle or engine manufacturer standard, the labeling requirements in Section 2.33.1.3.1. Vehicle or Engine Manufacturer Standard apply.

2.33.1.4. Tank Trucks or Rail Cars. –Tank trucks, rail cars, and other types of delivery trucks that are used to deliver bulk vehicle engine (motor) oil are not required to display the SAE viscosity grade and service category or categories on such tank trucks, rail cars, and other types of delivery trucks. **However, their bill of lading must clearly identify the product present in each compartment per Section 2.33.1.1. Viscosity Grade.**

(Amended 2013**,** ~~**and**~~ 2014 **and 20XX**)

2.33.1.5. Documentation. –When the engine (motor) oil is sold in bulk, an invoice, bill of lading, shipping paper, or other documentation must accompany each delivery. This document must identify the quantity of bulk engine (motor) oil delivered as defined in Sections 2.33.1.1. Viscosity; 2.33.1.2. Brand; 2.33.1.3. Engine Service Category; the name and address of the seller and buyer; and the date and time of the sale. For inactive or obsolete service categories, the documentation shall also bear a plainly visible cautionary statement as required in Section 2.33.1.3.2. Inactive or Obsolete Service Categories. Documentation must be retained at the retail establishment for a period of not less than one year.

(Added 2013) (Amended 2014)

(Added 2012) (Amended 2013 and 2014)

B5: FLR-7 A Sections 1.43. Motor Oil, 1.44. Racing Oil, 3.13. Oil and 7.2. Reproducibility Limits.

Item under Consideration:
Amend NIST Handbook 130, Uniform Engine Fuels and Automotive Lubricants Regulation as follows:

1.43. Motor Oil. –An oil that reduces friction and wear between the moving parts within a reciprocating internal combustion engine and also serves as a coolant. For the purposes of this regulation, "vehicle motor oil" refers to motor oil which is intended for use in light- to heavy-duty vehicles including cars, sport utility vehicles, vans, trucks, buses, and off-road farming and construction equipment. ~~**For the purposes of this regulation, "recreational motor oil" refers to motor oil which is intended for use in four-stroke cycle engines used in motorcycles, ATVs, and lawn and garden equipment. For the purposes of this regulation, motor oil also means engine oil.**~~
(Added 2004**, Amended 20XX**)

1.43.1. For the purposes of this regulation, "recreational motor oil" refers to motor oil which is intended for use in four-stroke cycle engines used in motorcycles (including minibikes and "dirt bikes"), ATVs, golf carts or other self-propelled vehicles that are not passenger cars.

1.43.2. For the purposes of this legislation, "non-transportation motor oil" refers to motor oil which is intended for use in stationary engines (such as those used in generators) and lawn and garden equipment. In particular, monograde products falling under the description of "non-transportation motor oil" (most commonly for lawn and garden equipment) shall be labelled with the following cautionary statement, in letters not less than 6.35 mm (1/4 in) in height:

WARNING: THIS PRODUCT IS GENERALLY NOT RECOMMENDED FOR USE IN GASOLINE-FUELED PASSENGER CAR ENGINES.

1.43.3. Some of the engines and vehicles described in 1.43.1 and 1.43.2 (such as riding lawnmowers "dirt bikes" and golf carts) may occasionally cross, or briefly transit on, public roads, but should not be construed as passenger vehicles for the purpose of this legislation. Thus, their engine oils are exempt from the requirement of featuring at least one active performance category or OEM credential. However, recreational motor oils and non-transportation motor oils shall be labelled with the following cautionary statement, in letters not less than 6.35 mm (1/4 in) in height:

WARNING: THIS PRODUCT IS NOT RECOMMENDED FOR USE IN GASOLINE-FUELED PASSENGER CAR ENGINES. IT IS INTENDED FOR USE IN RECREATIONAL (SUCH AS ATV) OR WORKING EQUIPMENT (SUCH AS GARDEN EQUIPMENT) APPLICATIONS.

1.44. Racing Oil. – An oil that reduces friction and wear between the moving parts within a reciprocating internal combustion engine and also serves as a coolant. For the purposes of this regulation, "racing oil" refers to motor oil which is intended for use in high-performance engines used in vehicles whose primary function excludes the transport of persons on public roads and highways. The vehicles requiring racing oils are generally race cars, dragsters, hot rods, funny cars and other vehicles modified for racing and/or spectator performance. The engines in such vehicles are often modified from standard OEM production, operated on fuels other than retail gasoline, and/or custom-built, and so Racing Oils are exempt from the requirement of featuring at least one active performance category or OEM credential. However, racing oils shall be labelled with the following cautionary statement, in letters not less than 6.35 mm (1/4 in) in height:

WARNING: THIS PRODUCT IS NOT RECOMMENDED FOR USE IN GASOLINE-FUELED PASSENGER CAR ENGINES. IT IS INTENDED FOR USE IN RACING APPLICATIONS.

(Renumber sections that follow)

And:

3.13. Oil.

3.13.1. Labeling of Vehicle Engine (Motor) Oil Required.

3.13.1.1. Viscosity. –The label on any vehicle engine (motor) oil container, receptacle, dispenser, or storage tank and the invoice or receipt from service on an engine that includes the installation of bulk vehicle engine (motor) oil dispensed from a receptacle, dispenser, or storage tank shall contain the viscosity grade classification preceded by the letters "SAE" in accordance with the SAE International's latest version of SAE J300, "Engine Oil Viscosity Classification." **Containers used in retail trade (such as bottles, jugs, pails, drums) are explicitly targeted by this legislation. Where possible in the available space, invoices and receipts shall also display the SAE Viscosity Grade (see Note).**

(Amended 2012**,** ~~and~~ 2014 **and 20XX**)

3.13.1.1.1. Most modern engine oil specifications are for multigrade products, and their SAE viscosity grade must appear in the form SAE XXW-YY. The use of "SAE" and of the hyphen are mandatory. Containers used in retail trade (such as bottles, jugs, pails, drums) are explicitly targeted by this legislation.

3.13.1.1.2. Engine oils marketed under obsolete API Categories SA and SB shall not be described as multigrades.

Note: If an invoice or receipt from service on an engine has limited room for identifying the viscosity, brand, and service category, then abbreviated versions of each may be used on the invoice or receipt and the letters "SAE" may be omitted from the viscosity classification.

3.13.1.2. Brand. –The label on any vehicle engine (motor) oil container and the invoice or receipt from service on an engine that includes the installation of bulk vehicle engine (motor) oil dispensed from a receptacle, dispenser, or storage tank shall contain the name, brand, trademark, or trade name of the vehicle engine (motor) oil.

(Added 2012 and 2014)

Note: If an invoice or receipt from service on an engine has limited room for identifying the viscosity, brand, and service category, then abbreviated versions of each may be used on the invoice or receipt and the letters "SAE" may be omitted from the viscosity classification.

3.13.1.3. Engine Service Category. –The label on any vehicle engine (motor) oil container, receptacle, dispenser or storage tank and the invoice or receipt from service on an engine that includes the installation of bulk vehicle engine (motor) oil dispensed from a receptacle, dispenser, or storage tank shall contain ~~the~~ **at least one active** engine service category, ~~or categories,~~ displayed in letters not less than 3.18 mm (1/8 in) in height, as defined by the latest version of SAE J183, "Engine Oil Performance and Engine Service Classification (Other than "Energy Conserving")" API Publication 1509, "Engine Oil Licensing and Certification System," European Automobile Manufacturers Association (ACEA), "European Oil Sequences," or other "Vehicle or Engine Manufacturer Standards" as provided in Section 3.13.1.3.1. **Containers used in retail trade (such as bottles, jugs, pails, drums) are explicitly targeted by this legislation.**

(Amended 2012**,** ~~and~~ 2014**, and 20XX**)

3.13.1.3.1. Vehicle or Engine Manufacturer Standard. –The label on any vehicle engine (motor) oil container, receptacle, dispenser, or storage tank and the invoice or receipt from service on an engine that includes the installation of vehicle engine (motor) oil dispensed from a receptacle, dispenser, or storage tank shall identify the specific vehicle or engine manufacturer standard, or standards, met in letters not less than 3.18 mm ($^1/_8$ in) in height. If the vehicle (motor) oil only meets a vehicle or engine manufacturer standard, the label must clearly identify that the oil is only intended for use where specifically recommended by the vehicle or engine manufacturer. **Containers used in retail trade (such as bottles, jugs, pails, drums) are explicitly targeted by this legislation.**

(Added 2014**, Amended 20XX**)

3.13.1.3.2. Inactive or Obsolete Service Categories. –The label on any vehicle engine (motor) oil container, receptacle, dispenser, or storage tank and the invoice or receipt from service on an engine that includes the installation of vehicle engine (motor) oil dispensed from a receptacle, dispenser, or storage tank shall bear a plainly visible cautionary statement in compliance with the latest version of SAE J183, "Engine Oil Performance and Engine Service Classification (Other than "Energy Conserving")" Appendix A, whenever the vehicle engine (motor) oil in the container or in bulk does not meet an active API service category as defined by the latest version of SAE J183, "Engine Oil Performance and Engine Service Classification (Other than "Energy Conserving")." ~~**If a vehicle engine (motor) oil is identified as only meeting a vehicle or engine manufacturer standard, the labeling requirements in Section 3.13.1.3.1. Vehicle or Engine Manufacturer Standard applies. Marketing of engine oils corresponding to obsolete performance categories as defined in SAE J183 is expressly forbidden, except for antique vehicles requiring non-detergent motor oils corresponding to API Categories SA or SB. Marketers and/or Retailers of products corresponding to API performance categories SA and SB must take judicious steps to ensure that these products are targeted to the engines intended to receive these materials. Such steps should include confinement of these products away from retail shelves featuring engine oils meeting current performance categories. Containers used in retail trade (such as bottles, jugs, pails, drums) are explicitly targeted by this legislation. Beyond product controls, the minimum labeling standard for compliance with this requirement requires the marketer to print one of the following statements, in accordance with the Category claimed, in letters not less than 6.35 mm (1/4 in) in height on the front label of any product marketed under API categories SA and SB:**~~

(Added 2012) (Amended 2014 **and 20XX**)

3.13.1.3.2.a. API SA Category. – Warning: This product IS NOT SUITABLE FOR USE IN MOST GASOLINE-POWERED AUTOMOTIVE ENGINES BUILT AFTER 1930.

3.13.1.3.2.b. API SB Category: – Warning: This product IS NOT SUITABLE FOR USE IN MOST GASOLINE-POWERED AUTOMOTIVE ENGINES BUILT AFTER 1951.

3.13.1.3.3. In addition to the minimum labeling standard described in 3.13.1.3.2. Inactive or Obsolete Service Categories, marketers shall include the full language expressing Category obsolescence in the latest edition of SAE J183 at time of manufacture.

3.13.1.3.3.a. API SA engine oils should bear the following text on the rear label, in letters not less than 3.18 mm ($^1/_8$ in) in height:

CAUTION: THIS OIL IS RATED API SA. IT CONTAINS NO ADDITIVES. IT IS NOT SUITABLE FOR USE IN MOST GASOLINE-POWERED AUTOMOTIVE ENGINES BUILT AFTER 1930. USE IN MODERN ENGINES MAY CAUSE UNSATISFACTORY ENGINE PERFORMANCE OR EQUIPMENT HARM.

3.13.1.3.3.b. API SB engine oils should bear the following text on the rear label, in letters not less than 3.18 mm ($^1/_8$ in) in height:

CAUTION: THIS OIL IS RATED API SB AND IS NOT SUITABLE FOR USE IN MOST GASOLINE-POWERED AUTOMOTIVE ENGINES BUILT AFTER 1951. USE IN MORE MODERN ENGINES MAY CAUSE UNSATISFACTORY PERFORMANCE OR EQUIPMENT HARM.

3.13.1.4. If a vehicle engine (motor) oil is identified as only meeting an active vehicle or engine manufacturer standard, the labeling requirements in Section 3.13.1.3.1. Vehicle or Engine Manufacturer Standard apply.

(Added 2012) (Amended 2014)

3.13.1.5. For the purposes of this regulation, "Racing oil" refers to motor oil which is intended for use in high-performance engines used in vehicles whose primary function excludes the transport of persons on public roads and highways. The vehicles requiring racing oils are generally race cars, dragsters, hot rods, funny cars and other vehicles modified for racing and/or spectator performance. The engines in such vehicles are often modified from standard OEM production, operated on fuels other than retail gasoline, and/or custom-built, and so Racing Oils are exempt from the requirement of featuring at least one active performance category or OEM credential. However, racing oils shall be labelled with the following cautionary statement, in letters not less than 6.35 mm (1/4 in) in height:

> **Warning: This product is not recommended for use in gasoline-fueled passenger car engines. It is intended for use in racing applications.**

3.13.1.6. Motorcycles, where wet clutches are present in the design, may not operate properly with highly friction-modified engine oils. As a result, motorcycle OEMs may recommend obsolete category oils in an attempt to avoid friction-modified formulations. Frequently, such recommendations are for "API SG" performance levels. All engine oils intended for the motorcycle market, claiming obsolete categories as defined within SAE J183, must be clearly identified "WARNING: For motorcycle use only" on the front label, in letters not less than 6.35 mm (1/4 in) in height.

> **3.13.1.6.1. If a vehicle engine (motor) oil is identified as only meeting a vehicle or engine manufacturer standard, the labeling requirements in Section 2.33.1.3.1. Vehicle or Engine Manufacturer Standard apply.**

3.13.1.~~6~~7. Tank Trucks or Rail Cars. – Tank trucks, rail cars, and other types of delivery trucks that are used to deliver bulk vehicle engine (motor) oil are not required to display the SAE viscosity grade and service category or categories on such tank trucks, rail cars, and other types of delivery trucks. **However, their bill of lading must clearly identify the product present in each compartment so as to satisfy the requirements of 3.13.1.8. Documentation.**

(Added 2012) (Amend 2013 and 2014)

3.13.1.~~7~~8. Documentation. – When the engine (motor) oil is sold in bulk, an invoice, bill of lading, shipping paper, or other documentation must accompany each delivery. This document must identify the quantity of bulk engine (motor) oil delivered as defined in Sections 3.13.1.1. Viscosity; 3.13.1.2. Brand; 3.13.1.3. Engine Service Category; the name and address of the seller and buyer; and the date and time of the sale. For inactive or obsolete service categories **API SA or SB)**, the documentation shall also bear a plainly visible cautionary statement as required in Section 3.13.1.3.2. Inactive or Obsolete Service Categories. Documentation must be retained at the retail establishment for a period of not less than one year.

(Added 2013) (Amended 2014)
(Amended 2012, 2013, and 2014)

3.13.1.4. Tank Trucks or Rail Cars. –Tank trucks, rail cars, and types of delivery trucks that are used to deliver bulk vehicle engine (motor) oil are not required to display the SAE viscosity grade and service category or categories on such tank trucks, rail cars, and other types of delivery trucks.

(Added 2012) (Amend 2013 and 2014)

3.13.1.5. Documentation. – When the engine (motor) oil is sold in bulk, an invoice, bill of lading, shipping paper, or other documentation must accompany each delivery. This document must identify the quantity of bulk engine (motor) oil delivered as defined in Sections 3.13.1.1. Viscosity; 3.13.1.2. Brand; 3.13.1.3. Engine Service Category; the name and address of the seller and buyer; and the date and time of the sale. For inactive or obsolete service categories, the documentation shall also bear a plainly visible cautionary statement as required in Section 3.13.1.3.2. Inactive or Obsolete Service Categories. Documentation must be retained at the retail establishment for a period of not less than one year.

(Added 2013) (Amended 2014)

(Amended 2012, 2013, and 2014)

3.13.2. Labeling of Recreational Motor Oil.

3.13.2.1. Viscosity. ~~– **The label on each container of recreational motor oil shall contain the viscosity grade classification preceded by the letters "SAE" in accordance with the SAE International's latest version of SAE J300, "Engine Oil Viscosity Classification."**~~ **<u>The label on any vehicle engine (motor) oil container, receptacle, dispenser, or storage tank and the invoice or receipt from service on an engine that includes the installation of bulk vehicle engine (motor) oil dispensed from a receptacle, dispenser, or storage tank shall contain the viscosity grade classification preceded by the letters "SAE" in accordance with the SAE International's latest version of SAE J300, "Engine Oil Viscosity Classification." Containers used in retail trade (such as bottles, jugs, pails, drums) are explicitly targeted by this legislation. Where possible in the available space, invoices and receipts shall also display the SAE Viscosity Grade (see Note).</u>**

<u>Note: If an invoice or receipt from service on an engine has limited room for identifying the viscosity, brand, and service category, then abbreviated versions of each may be used on the invoice or receipt and the letters "SAE" may be omitted from the viscosity classification.</u>

3.13.2.2. Intended Use. –The label on each container of recreational motor oil shall contain a statement of its intended use**<u>.</u>** ~~**in accordance with the latest version of SAE J300, "Engine Oil Viscosity Classification."**~~ **<u>Where the intended use is not the lubrication of modern passenger car engines, a cautionary statement warning the consumer that the product is not recommended for typical passenger car engines must appear on the label. Containers used in retail trade (such as bottles, jugs, pails, drums) are explicitly targeted by this legislation. Where possible in the available space, invoices and receipts shall also display the SAE Viscosity Grade (see Note). In particular, monograde products falling under the description of "recreational motor oil" (most commonly for lawn and garden equipment) shall be labelled with the following cautionary statement, in letters not less than 3.18 mm ($^1/_8$ in) in height:</u>**

> **<u>Warning: This product is Generally not recommended for use in gasoline-fueled passenger car engines.</u>**

<u>Note: If an invoice or receipt from service on an engine has limited room for identifying the viscosity, brand, and service category, then abbreviated versions of each may be used on the invoice or receipt and the letters "SAE" may be omitted from the viscosity classification</u>

And:

7.2. Reproducibility Limits.

7.2.1. AKI Limits. – When determining the antiknock index acceptance or rejection of a gasoline sample, the AKI reproducibility limits as outlined in the latest version of ASTM D4814, "Standard Specification for Automotive Spark-Ignition Engine Fuel, Appendix X1 shall be acknowledged for enforcement purposes.

7.2.2. Reproducibility. – The reproducibility limits of the standard test method used for each test performed shall be acknowledged for enforcement purposes, except as indicated in Section 2.2.1. Premium Diesel Fuel and Section 7.2.1. AKI Limits. No allowance shall be made for the precision of the test methods for aviation gasoline or aviation turbine fuels.

(Amended 2008)

7.2.3. SAE Viscosity Grades for Engine Oils. – All values are critical specifications as defined in the latest version of ASTM D3244, "Standard Practice for Utilization of Test Data to Determine Conformance with Specifications." **All values, with the exception of the low-temperature cranking viscosity, are critical specifications as defined by ASTM D3244 (see text, Section7). ASTM D5293: Cranking viscosity – The non-critical specification protocol in ASTM D3244 shall be applied with a P value of 0.95. ASTM D4684: Note that the presence of any yield stress detectable by this method constitutes a failure regardless of viscosity.** The product shall be considered to be in conformance if the Assigned Test Value (ATV) is within the specification.

(Added 2008)

Background/Discussion:

(These items appeared on the 2017 Fall Regional reports as New Item 13 and New Item 14. On the 2018 NCWM Interim and Annual Reports they appear as Item Block 5 (B5), B5: MOS-6 and B5:FLR7.)

Consumers are being misled and are not being adequately informed under existing NIST Handbook 130 regulations about the performance of "obsolete" oils in the engines of their vehicles. Many of these obsolete oils can damage modern engines. The submitter recognizes that there may be as many as 14 million vehicles that can use pre-1988 motor oils.

At the 2018 NCWM Interim Meeting, Mr. Bill Striejewske (FALS Chairman), indicated that FALS is recommending this as a Voting item. In addition, support was heard from ILMA, API, and several regulators recommending this item as a Voting item. However, many commenters stated that editorial and minor changes were still needed for the item to be fully developed. Tim Elliot (Washington) recommended that this item have streamlined language to use a generic warning statement. Suggestions were also provided on the ultimate placement of the label. Due to lack of consensus, potentially non-editorial changes, and lack of specific details on proposed changes, the L&R Committee recommends this item be "Assigned" to FALS for further development to address the issues mentioned in this write-up.

At the 2018 NCWM Annual, Mr. Striejewske remarked he was contacted by the submitter they will be submitting modified language to FALS for consideration. FALS will request that the submitter provide the language for inclusion into the 2018 Fall regional agendas.

Regional Association Comments:
At the 2017 WWMA Annual Meeting the Committee reviewed modified language submitted by Ms. Holly Alfano (ILMA), and recommends pending editorial review, this item should move forward.

2.33. Oil.

2.33.1. Labeling of Vehicle Engine (Motor) Oil. – Vehicle engine (motor) oil shall be labeled.

2.33.1.1. Viscosity Grade. –The label on any vehicle engine (motor) oil container, receptacle, dispenser, or storage tank, and any invoice or receipt from service on an engine that includes the installation of vehicle engine (motor) oil dispensed from a receptacle, dispenser, or storage tank, shall contain the viscosity grade classification preceded by the letters "SAE" in accordance with SAE International's latest version of SAE J300, "Engine Oil Viscosity Classification

2.33.1.1.1. Most modern engine oil specifications recommend the use of multigrade engine (motor) oils, and their SAE viscosity grade must appear in the form SAE XXW-YY. The use of "SAE" and of the hyphen are mandatory. Containers used in retail trade (such as bottles, jugs, pails, drums) are explicitly targeted by this legislation.

<u>2.33.1.1.2. Engine oils marketed under obsolete API Service Categories SA and SB shall not be described as multigrades.</u>

NOTE: *If an invoice or receipt from service on an engine has limited room for identifying the viscosity, brand, and service category, then abbreviated versions of each may be used on the invoice or receipt and the letters "SAE" may be omitted from the viscosity classification.*

(Note added 2014)

(Amended 2014)

2.33.1.2. Brand. –The label on any vehicle engine (motor) oil container and the invoice or receipt from service on an engine that includes the installation of bulk vehicle engine (motor) oil dispensed from a receptacle, dispenser, or storage tank shall contain the name, brand, trademark, or trade name of the vehicle engine (motor) oil.

(Amended 2014)

<u>Note: If an invoice or receipt from service on an engine has limited room for identifying the viscosity, brand, and service category, then abbreviated versions of each may be used on the invoice or receipt and the letters "SAE" may be omitted from the viscosity classification.</u>

2.33.1.3. Engine Service Category. –The label on any vehicle engine (motor) oil container, receptacle, dispenser, or storage tank and the invoice or receipt from service on an engine that includes the installation of bulk vehicle engine (motor) oil dispensed from a receptacle, dispenser, or storage tank shall contain ~~**the**~~ **<u>at least one</u>** engine service category, ~~**or categories,**~~ displayed in letters not less than 3.18 mm (1/8 in) in height, as defined by the latest version of SAE J183, "Engine Oil Performance and Engine Service Classification (Other than "Energy Conserving")," API Publication 1509, "Engine Oil Licensing and Certification System," European Automobile Manufacturers Association (ACEA), "European Oil Sequences," or other Vehicle or Engine Manufacturer standards as approved in Section 2.33.1.3.1. Vehicle or Engine Manufacturer Standard**<u>.</u>**

(Amended 2014 **<u>and 20XX</u>**)

2.33.1.3.1. Vehicle or Engine Manufacturer Standard. –The label on any vehicle engine (motor) oil container, receptacle, dispenser, or storage tank and the invoice or receipt from service on an engine that includes the installation of vehicle engine (motor) oil dispensed from a receptacle, dispenser, or storage tank shall identify the specific vehicle or engine manufacturer standard, or standards, met in letters not less than 3.18 mm (1/8 in) in height. If the vehicle (motor) oil only meets a**<u>n active</u>** vehicle or engine manufacturer standard, the label must clearly identify that the oil is only intended for use where specifically recommended by the vehicle or engine manufacturer.

(Added 2014**<u>, Amended 20XX</u>**)

2.33.1.3.2. Inactive or Obsolete Service Categories. –The label on any vehicle engine (motor) oil container, receptacle, dispenser, or storage tank and the invoice or receipt from service on an engine that includes the installation of bulk vehicle engine (motor) oil dispensed from a receptacle, dispenser, or storage tank shall bear a plainly visible cautionary statement in compliance with the latest version of SAE J183, Appendix A, whenever the vehicle engine (motor) oil in the container or in bulk does not meet an active API service category as defined by the latest version of SAE J183, "Engine Oil Performance and Engine Service Classification (Other than "Energy Conserving")." ~~**If a vehicle engine (motor) oil is identified as only meeting a vehicle or engine manufacturer standard, the labeling requirements in Section 2.33.1.3.1. Vehicle or Engine Manufacturer Standard applies.**~~ **<u>Marketing of engine oils corresponding to obsolete performance categories as defined in SAE J183 is expressly forbidden, except for antique vehicles requiring non-detergent motor oils corresponding to API Service Categories SA or SB. Marketers and/or Retailers of products corresponding to API Service Categories SA and SB must take judicious steps to ensure that these products are targeted to the engines intended to receive these materials. Such steps should include confinement of these products away from retail shelves featuring engine oils meeting</u>**

current Service Categories. Containers used in retail trade (such as bottles, jugs, pails, drums) are explicitly targeted by this legislation. Beyond product controls, the minimum labeling standard for compliance with this requirement requires the marketer to print one of the following statements, in accordance with the Category claimed, in letters not less than 6.35 mm ($^{1}/_{4}$ in) in height on the front label of any product marketed under API Service Categories SA and SB:

(Amended 2014**, 20XX**)

2.33.1.3.2.a. API SA Category. – WARNING: THIS PRODUCT IS NOT SUITABLE FOR USE IN MOST GASOLINE-POWERED AUTOMOTIVE ENGINES BUILT AFTER 1930.

2.33.1.3.2.b. API SB Category: – WARNING: THIS PRODUCT IS NOT SUITABLE FOR USE IN MOST GASOLINE-POWERED AUTOMOTIVE ENGINES BUILT AFTER 1951.

2.33.1.3.3. In addition to the minimum labeling standard described in 2.33.1.3.2., marketers shall include the full language expressing Service Category obsolescence in the latest edition of SAE J183 at time of manufacture.

2.33.1.3.3.a. API SA engine oils should bear the following text on the rear label, in letters not less than 3.18 mm ($^{1}/_{8}$ in) in height:

CAUTION: THIS OIL IS RATED API SA. IT CONTAINS NO ADDITIVES. IT IS NOT SUITABLE FOR USE IN MOST GASOLINE-POWERED AUTOMOTIVE ENGINES BUILT AFTER 1930. USE IN MODERN ENGINES MAY CAUSE UNSATISFACTORY ENGINE PERFORMANCE OR EQUIPMENT HARM.

2.33.1.3.3.b. API SB engine oils should bear the following text on the rear label, in letters not less than 3.18 mm ($^{1}/_{8}$ in) in height:

CAUTION: THIS OIL IS RATED API SB AND IS NOT SUITABLE FOR USE IN MOST GASOLINE-POWERED AUTOMOTIVE ENGINES BUILT AFTER 1951. USE IN MORE MODERN ENGINES MAY CAUSE UNSATISFACTORY PERFORMANCE OR EQUIPMENT HARM.

2.33.1.3.4. Motorcycles where wet clutches are present in the design, may not operate properly with highly friction-modified engine oils. As a result, some motorcycle manufacturers recommend obsolete API Service Category oils (for example, API SG) in an attempt to avoid these friction-modified formulations. All engine oils intended for the motorcycle market claiming obsolete Service Categories as defined within SAE J183 must be clearly identified with "WARNING: FOR MOTORCYCLE USE ONLY" on the front label, in letters not less than 6.35 mm ($^{1}/_{4}$ in) in height.

2.33.1.3.5. If a vehicle engine (motor) oil is identified as only meeting a vehicle or engine manufacturer standard, the labeling requirements in Section 2.33.1.3.1. Vehicle or Engine Manufacturer Standard apply.

2.33.1.4. Tank Trucks or Rail Cars. –Tank trucks, rail cars, and other types of delivery trucks that are used to deliver bulk vehicle engine (motor) oil are not required to display the SAE viscosity grade and service category or categories on such tank trucks, rail cars, and other types of delivery trucks. **However, their bill of lading must clearly identify the product present in each compartment per Section 2.33.1.1.**

(Amended 2013**,** ~~and~~ 2014 **and 20XX**)

2.33.1.5. Documentation. –When the engine (motor) oil is sold in bulk, an invoice, bill of lading, shipping paper, or other documentation must accompany each delivery. This document must identify the quantity of bulk engine (motor) oil delivered as defined in Sections 2.33.1.1. Viscosity; 2.33.1.2. Brand; 2.33.1.3. Engine Service Category; the name and address of the seller and buyer; and the date and time of the sale. For inactive or obsolete service categories, the documentation shall also bear a plainly visible cautionary statement as required in Section 2.33.1.3.2. Inactive or Obsolete Service Categories. Documentation must be retained at the retail establishment for a period of not less than one year.

(Added 2013) (Amended 2014)

(Added 2012) (Amended 2013 and 2014)

At the 2017 SWMA Annual Meeting, Mr. Kevin Ferrick (API) provided a presentation on behalf of ILMA. The NIST Technical Advisor remarked that parts of the proposal do not follow the NIST Handbook 130 formatting structure. She will work with the submitter on formatting prior to the 2018 NCWM Interim Meeting.

At the 2017 CWMA Interim Meeting, the Committee supports this proposal and believes that the submitter intends to provide modified language prior to the 2018 Interim Meeting. The CWMA recommended that this remain a Developing item. At the 2018 CWMA Annual Meeting Mr. Hayes (MO) commented that these items are under development by an informal focus group in FALS. The CWMA recommends this be assigned to FALS for further development.

At the 2017 NEWMA Interim Meeting, Mr. Jeff Leiter (ILMA) provide a presentation regarding "obsolete oils." ILMA and NIST are working to have revised language ready for FALS to review at its meeting in January 2018. A Pennsylvania regulator questioned if enforcing types of obsolete engine oils is a weights and measures issue. He is concerned that regulators are challenged and constrained when enforcing these products, since many of them are properly marked. He believes the consumer should be informed and able to determine if a particular engine oil sold at retail is appropriate for their vehicle. A state regulator (New York) concurred with the statement. NEWMA believes this item deserves additional consideration and vetting by FALS. At the 2018 NEWMA Annual Meeting no comments were heard on this item. NEWMA is recommending this to be assigned to FALS for further development.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to **www.ncwm.net/meetings/annual/publication-16** to review these documents.

PAL – UNIFORM PACKAGING AND LABELING REGULATION

PAL-2 VC Section 11.8. Packaged Commodities with Labeling Requirements Specified in Federal Laws. and Appendix C. Reference Information for Packaged Commodities with Labeling Requirements Specified in Federal Laws and Regulations

(This item was Adopted)

Source:
NIST OWM (2018)

Purpose:
To update exemptions in the regulation with requirements specified in federal laws and regulations.

Item under Consideration:
Amend NIST Handbook 130 Uniform Regulation for the Uniform Packaging and Labeling Regulation as follows:

11.8. Packaged Commodities with Labeling Requirements Specified in Federal Laws <u>and Regulations</u>. – Packages of alcoholic beverages <u>**(i.e., beer, distilled spirits and wine)**</u>, <u>**cosmetics, catfish (Siluriformes),**</u> meat and meat products, <u>**medical devices, over-the-counter drugs,**</u> poultry products, tobacco and tobacco products, pesticides, and shall be exempt from those portions of these regulations specifying location<u>**, symbols, abbreviations**</u> and minimum type size of the net quantity declaration, provided <u>**net**</u> quantity <u>**of contents and**</u>

other required labeling requirements **(i.e., identity, responsibility)** for such products are specified in federal law **or regulation** so as to follow reasonably sound principles of providing consumer information. (See also Section 11.32. SI Units, Exemptions - Consumer Commodities **and Appendix C. Reference Information for Packaged Commodities with Labeling Requirements Specified in Federal Laws and Regulations**)

And add new Appendix C as follows:

Appendix C. Reference Information for Packaged Commodities with Labeling Requirements Specified in Federal Laws and Regulations

Product **Agency**	**Code of Federal Regulations**	**Net Quantity of Contents Requirements, Guides or Other Information**
Alcoholic Beverages, Wine and Beer **Treasury Department – Alcohol, Tobacco Tax and Trade Bureau.** **www.ttb.gov**	**27 CFR, Chapter. I, Subchapter A. "Alcohol."**	**Refer to Part 4 "Labeling and Advertising of Wine."** **Refer Part 5 "Labeling and Advertising of Distilled Spirits." See also: The Beverage Alcohol Manual (BAM) A Practical Guide – "Basic Mandatory Labeling Information for Distilled Spirits - Volume 2" at www.ttb.gov/spirits/bam.shtml** **Refer to Part 7 "Labeling and Advertising of Malt Beverages." See also: "The Beverage Alcohol Manual (BAM) A Practical Guide" at www.ttb.gov/beer/bam.shtml**
Animal Food **Food and Drug Administration** **www.fda.gov**	**21 CFR 501, Chapter I, Subchapter E – Animal Drugs, Feeds and Related Products. "Animal Food Labeling. Subpart F – Exemptions, Animal Food Labeling Requirements.".**	**Refer to § 501.105 – "Declaration of net quantity of contents when exempt."**
Catfish* (Siluriformes) **U.S.D.A.– Food Safety and Inspection Service** **www.fsis.usda.gov**	**9 CFR 541, Chapter III, Subchapter F "Marks, Marking and Labeling of Products and Containers."**	**Refer to § 541.7 which incorporates the requirements in 9 CFR 317.2 "Labels: definitions; required features."** ***Fish of the order Siluriformes include, but are not limited to, ''catfish'' (fish of the family Ictaluridae) and ''basa'' and ''swai'' (fish of the family Pangasiidae).**
Cosmetics **Food and Drug Administration** **www.fda.gov**	**21 CFR 701, Chapter I Subchapter G "Cosmetic Labeling"**	**Refer to § 701.13 – "Declaration of net quantity of contents."** **See also: www.fda.gov/Cosmetics/Labeling/default.htm**

<table>
<tr><th colspan="3">Appendix C. Reference Information for Packaged Commodities with Labeling Requirements Specified in Federal Laws and Regulations</th></tr>
<tr><th>Product
Agency</th><th>Code of Federal Regulations</th><th>Net Quantity of Contents Requirements, Guides or Other Information</th></tr>
<tr><td rowspan="2">Meat & Poultry Products

U.S.D.A.– Food Safety and Inspection Service

www.fsis.usda.gov</td><td>Meat and Meat Products:

9 CFR 317, Chapter III, Subchapter A “Labeling, Marking Devices and Containers”</td><td>Refer to § 317.2 “Labels: definitions; required features.”</td></tr>
<tr><td>Poultry:

9 CFR 442, Chapter III Subchapter E, “Quantity of Contents Labeling and Procedures and Requirements for Accurate Weights”</td><td>Refer to § 442.1 – “Quantity of contents labeling.”</td></tr>
<tr><td>Over-the-Counter Medical Devices

Food and Drug Administration

www.fda.gov</td><td>21 CFR 801, Chapter I, Subchapter H “Labeling Subpart C - Labeling Requirements for Over-the-Counter Medical Devices”</td><td>Refer to § 801.62 - Declaration of net quantity of contents.</td></tr>
<tr><td>Over-the- Counter Drugs

Food and Drug Administration

www.fda.gov</td><td>21 CFR 201, Chapter I Subchapter C - Drugs, “Labeling”</td><td>Refer to § 201.62 “Declaration of Net Quantity of Contents”</td></tr>
<tr><td>Pesticides

Environmental Protection Agency

www.epa.gov</td><td>40 CFR 156, Chapter. I, Subchapter E, “Labeling Requirements for Pesticides and Devices,” Subpart A, “General Provisions”</td><td>Refer to § 156.10 “Labeling requirements.”

See also: “Pesticide Registration – Label Review Manual” at www.epa.gov/pesticide-registration/label-review-manual</td></tr>
</table>

Appendix C. Reference Information for Packaged Commodities with Labeling Requirements Specified in Federal Laws and Regulations		
Product **Agency**	**Code of Federal Regulations**	**Net Quantity of Contents Requirements, Guides or Other Information**
Tobacco and Tobacco Products **Food and Drug Administration** **www.fda.gov**	**Section 903 of the Federal Food, Drug, and Cosmetic Act - Misbranded Tobacco Products**	**Since 2009 FDA has regulated all tobacco products, including e-cigarettes, hookah tobacco, and cigars. The exceptions to the UPLR in § 11.5 for "Cuts, Plugs and Twists of Tobacco and Cigars" and § 11.7. for "Cigarettes and Small Cigars" remain in effect as they were based on Treasury Department labeling requirements for smokeless tobacco (chewing tobacco and snuff) and recognize traditional methods of sale of tobacco in cuts, plugs and twists as well as cigars.**
Regulations are codified annually in the *U.S. Code of Federal Regulations* (CFR) online at: www.gpo.gov/fdsys/browse/collectionCfr.action?collectionCode=CFR		

(Added 2018)

Background/Discussion:

(This item appeared on the 2017 Fall Regional reports as New Item 9. On the 2018 NCWM Interim and Annual Reports it appears as PAL-2.)

The current section was added to the NIST Handbook 130, Uniform Packaging and Labeling Regulation (UPLR) to alert the reader that the UPLR does not identify all the differences between the UPLR and Federal Regulations. This section notifies the reader that some products are subject to regulation by federal agencies, however, it does not identify the specific agency by product responsibility. This current proposal is to add additional product details and other useful information to Section 11.8. Packaged Commodities with Labeling Requirements Specified in Federal Law, because as it is currently written it does not include sufficient information on which agency regulates which products.

In addition, it is being requested that a new Appendix be added to the UPLR titled "Reference Information for Packaged Commodities with Labeling Requirements Specified in Federal Laws and Regulations" provides the identity of the specific agency overseeing the products listed, agency contact information, and specific reference(s) within the Code of Federal Regulations. This also updates the section to reflect that the regulation for tobacco is now under the Food and Drug Administration jurisdiction and the USDA now regulates "Catfish" (Siluriformes). Updating this section is to provide field inspectors with additional information on labeling resources they can refer to before acting on possible labeling violations. This is necessary as many jurisdictions have expanded their package inspection programs to include a wider range of products in a broader range of retail stores. Appendix C. will also assist industry users of the handbook in locating the labeling resources they need to ensure their products are labeled properly.

OWM does not anticipate opposition to this proposal as it adds clarifying information and useful research links to the UPLR.

At the 2018 NCWM Interim Meeting, Mr. Kurt Floren (Los Angeles County, CA) remarked that Section 11.8 is titled "Packaged Commodities with Labeling Requirements Specified in Federal Laws and Regulations." However, the proposed language later in the Appendix chart refers to requirements specified in "federal law, regulation or official guidance." Mr. Floren questions the meaning of the term "official guidance" in Section 11.8., which could open a whole range of guidance, such as emails to business and other communications and believes this language should be removed. Mr. Chris Guay (Procter and Gamble commented that there is a need to ensure Appendix C. is correct on scope and detail. Gathering letters of interpretation are a benefit, and should be shared if NIST has them, but not referenced here. The L&R Committee has stricken the words "official guidance" in Section 11.8. Packaged

Commodities with Labeling Requirements Specified in Federal Laws, since it is not clearly defined what is deemed official. The L&R Committee believes that this item is fully developed and recommends it as a Voting item. At the 2018 NCWM Annual Meeting, Mr. Floren is supportive of this item and the inclusion of Appendix C. However, he questions the accuracy of information for USDA regulated facilities. The Committee reviewed the regulations for USDA regulated facilities and concurred that the information is correct as it appears on the chart.

Regional Association Comments:
At the 2017 WWMA Annual Meeting, Ms. Lisa Warfield (NIST Technical Advisor) commented that this item is to add a chart that proposes a listing of agencies and what they regulate for the sake of clarity and convenience for inspectors. For instance, FDA now regulates tobacco and catfish. The Committee believes this item is fully developed and is ready for Voting status.

At the 2017 SWMA Annual Meeting, Ms. Warfield remarked that the Tobacco and Trade Bureau (TTB) no longer regulates Tobacco but does control the taxing portion of tobacco. The FDA is delegated to regulate tobacco. In addition, FDA is also the regulating agency for Siluriformes (catfish.) The proposal updates the chart in Appendix C. to reflect the product and agency responsibility, a hyperlink directs the user to the Code of Federal Regulations (CFR) and to the net quantity requirements, guides, or other useful information. The SWMA believes this item is ready for a Vote at the NCWM.

At the 2017 CWMA Interim Meeting, an industry representative commented this item is highlighting regulations that are outdated (such as metric references). He is concerned that placing outdated regulations in the NIST Handbook could facilitate details that may cause inspectors and state regulatory agencies enforcement challenges. The Committee believes the table is helpful and provides a good reference to facilitate enforcement practices and recommended that it be a Voting item. No comments were heard on this item at the 2018 CWMA Annual Meeting.

At the 2017 NEWMA Interim and 2018 NEWMA Annual Meetings, there were no comments were heard. NEWMA recommended this item move forward as a voting item.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to **www.ncwm.net/meetings/annual/publication-16** to review these documents.

MOS – UNIFORM REGULATION FOR THE METHOD OF SALE COMMODITIES

MOS-7 V Section 1. Food Products and Section 2. Non-Food Products

Source:
Los Angeles County, California (2016)

Purpose:
Clarify and formalize the long-standing, fundamental, core tenet of legal metrology and weights and measures regulation that the sale of any commodity, in any form or by any method, be according to legally-recognized, traceable units of measure.

Item under Consideration:
Amend the Uniform Regulation for the Method of Sale of Commodities, Preamble.

Preamble

The purpose of this regulation is to require accurate and adequate information about commodities so that purchasers can make price and quantity comparisons.

Packages and their labels should enable consumers to obtain accurate information as to the quantity of the contents and should facilitate value comparisons. Equally, sales of commodities from bulk should be according to methods and units readily recognized and understood by, both, buyer and seller.

Section 1. Food Products

(a) **Unless otherwise specified or specifically permitted, the sale of any food product, whether sold from bulk or in packaged form, shall be only according to a unit of measure or weight that meets all of the following criteria:**

(1) Is recognized and defined by NIST as legal for use in commerce

(2) Has been published in the "Federal Register"; and

(3) The measurement values have metrological traceability *(NOTE #, page #)* **to a national standard.**

Note: Sale of a product or commodity according to count, where appropriate to be fully informative to facilitate value comparison, is permissible as a method of sale.
(Added 1989)(**Amended 20XX)**

Section 2. Non-food Products [*NOTE 1*, page 109]

(a) **Unless otherwise specified or specifically permitted, the sale of any non-food product, whether sold from bulk or in packaged form, shall be only according to a unit of measure or weight that meets all of the following criteria:**

(1) Is recognized and defined by NIST as legal for use in commerce

(2) Has been published in the "Federal Register"; and

(3) The measurement values have metrological traceability *(NOTE #, page #)* **to a national standard.**

Note: Sale of a product or commodity according to count, where appropriate to be fully informative to facilitate value comparison, is permissible as a method of sale.
(Added 1989)(**Amended 20XX)**

Background/Discussion:

(This appeared on the 2017 Fall regional reports as Item 2302-1. On the 2018 NCWM Interim and Annual Reports it appears as MOS-7.)

Much discussion and debate has been undertaken within the NCWM over the past two years regarding proposals for methods of sale of commodities (specifically, liquefied natural gas and compressed natural gas as vehicle fuels) based upon "equivalencies" to other methods of sale for different commodities (in these recent cases, based upon calculated average energy content comparisons to gasoline or diesel fuel). With the exception of a singular commodity, compressed natural gas, for which gasoline-liter-equivalent and gasoline-gallon-equivalent methods of sale were permitted some 20 years ago, the methods of sale for all other commodities have historically and consistently been established based upon legally-recognized units of weight or measure that are traceable to national standards maintained by NIST, the sole exceptions (found in interpretations and guidelines) being specific fresh vegetable commodities permitted to be sold by "head" or "bunch." Discussions surrounding considerations of "equivalency" units have raised the potential for untold similar proposals to establish methods of sale for countless competing products in the marketplace claiming comparisons of performance, quality, energy or nutritional content, or other factors which can be subjective, widely varying due to inconsistent chemical or biological makeup, or a host of other influences that are, or may be, based upon little to no scientific or metrologically sound and traceable determinations or calculations.

While a core tenet of weights and measures regulation and legal metrology – whether regarding design and function of weighing and measuring devices or sales of commodities - has always been widely recognized to require employment of units of measure that are recognized and published as legal for use and having metrological traceability, clear language in model laws and regulations developed by NCWM and published in NIST Handbooks is absent, likely never heretofore being deemed necessary due to the well-established, long-held tenet. This proposal serves to codify, memorialize, and specifically clarify that tenet as a formal adoption in NIST Handbook 130, Uniform Regulation for the Method of Sale of Commodities to ensure against potentially misleading, confusing, or unclear business practices in commerce, whether in sales from bulk or in labeling of packaged commodities, that may be based upon observations, calculations, assumptions, or other considerations that may be subjective and not metrologically traceable.

At the 2016 NCWM Interim Meeting, Mr. Kurt Floren (Los Angeles County, CA) remarked that this would codify a long-standing practice. This item not intended to interfere with the current debate on liquefied natural gas (LNG). Mr. Floren encouraged the item on LNG to have a vote prior to this item. If the LNG proposal is adopted, this item could be amended from the floor of the conference. A former regulator remarked that Uniform Weights and Measures Law, Section (n) allows the term or unit of weight or measure be used if it is determined that an existing or firmly established practice. This proposal conflicts with Weights and Measures Law Section 12(n) that states this is a state function, not NIST controlled. The term on "traceability" is in NIST Handbook 130, Uniform Weights and Measures Law. NIST remarked that when changes are made to NIST SP 811, "*The NIST Guide for use of International System of Units*" or NIST SP 330, "*The International System of Units (SI)*" it is required that a Federal Register notice be done.

The Committee is unclear as to what issue this proposal resolves. The Committee would also like to know what impact this would have for all items covered under the current Method of Sale of Commodities Regulation. The Committee agreed to move this forward as a Developing item to allow the submitter to develop additional data and to have the Regions submit feedback. At the 2016 NCWM Annual Meeting there were no updates for the Committee.

At the 2017 NCWM Interim Meeting, Mr. Floren commented that this item was delayed pending the outcome of a former L&R agenda item pertaining to compressed natural gas. The Committee agreed unanimously that this is ready as a Voting item.

At the 2017 NCWM Annual Meeting, Mr. Floren submitted modified language to the Committee for consideration. This modified language was due to the adoption of Section 2.27.1. Definitions, and a minor modification to Section 1. Food Products (b) to state that it is at the discretion of the State Director. There were several voices that supported this item or concept. Ross Andersen, (retired New York regulator) expressed his objection to this item in its entirety. He believes that the uniform regulation is specific for the items having a uniform method of sale. He also stated that NCWM's authority does not extend to impact all products and commodities. This item was returned to Committee for future consideration.

At the 2018 NCWM Interim Meeting, Mr. Floren submitted modified language. Many comments were heard regarding this proposal, both in support and opposition. The Committee feels that the comments received were philosophical in nature. The L&R Committee believes this item is fully developed and recommends it as a Voting status.

At the 2018 NCWM Annual Meeting, the Committee reviewed a letter of opposition from Mr. Andersen believes there is no compelling need or justification for this language to be placed into NIST Handbook 130. He firmly believes that NCWM has no authority to adopt such language. The NIST Technical Advisor clarified that NIST roles and responsibilities are not addressed in the "Organic Act" as stipulated in Mr. Andersen's letter. They also clarified when this initial proposal was being developed the submitter had worked with senior managers within at OWM. The Committee believes this item is fully developed and ready for a vote.

Regional Association Comments:
At the 2017 WWMA Annual Meeting, modified language was submitted close to the start of the WWMA meeting. Committee and regional members did not have sufficient time review the language. The Committee believes the item has merit and should be reviewed by the other regions prior to the 2018 NCWM Interim Meeting in January. The

modified language is listed below, and the Committee suggests it move forward for consideration as an Informational item.

Modified Language from Submitter:

Preamble

The purpose of this regulation is to require accurate and adequate information about commodities so that purchasers can make price and quantity comparisons.

Packages and their labels should enable consumers to obtain accurate information as to the quantity of the contents and should facilitate value comparisons. Equally, sales of commodities from bulk should be according to methods and units readily recognized and understood by, both, buyer and seller. Unless otherwise specified or specifically permitted, the sale of any commodity shall be only according to a unit of measure or weight that meets all of the following criteria:

> **(1) Is recognized and defined by NIST as legal for use in commerce**
>
> **(2) Has been published in the "Federal Register"; and**
>
> **(3) Has metrological traceability** ***(NOTE #, page #)*** **to a national standard**

Note: Sale of a product or commodity according to count, where appropriate to be fully informative to facilitate value comparison, is permissible as a method of sale.

(Added 1989)(**Amended 20XX)**

At the 2017 SWMA Annual Meeting, they reviewed the modified language and questions what legal ramifications does language in a preamble have? Is this the correct location for such language? If the submitter wants an item that is enforceable then the Committee would like an additional look at the placement of such. The SWMA is recommending this as an Informational item.

At the 2017 CWMA Interim Meeting, the Committee believes the item has been fully developed but some Committee members are not clear why the wording was moved to the Preamble. There is also concern as to how far traceability goes (i.e. SI units including primary, secondary, etc.). The CWMA recommends this be a Voting item. At the 2018 CWMA Annual Meeting, Mr. Loren Minnich (Kansas) supported this item and he stated they have a manufacturer that wants to sell an item by a unit that is not traceable. He believes this item will support the weights and measures efforts to explain the importance of traceable units for comparison purposes. The CWMA recommends this as a Voting item

At the 2017 NEWMA Interim Meeting, the Chairman explained that the submitter modified the language, which is located under the L&R supporting documents on the NCWM website. Mr. Ross Anderson (retired New York regulator) commented that each of the sections in the Handbook are reactionary to a specific circumstance. This item is a change in philosophy to establish constraints on methods of sale without a specific circumstance. A state regulator from Pennsylvania suggested that this language simply provides the ability for standardization of method of sale. However, states always have the right to override methods of sale established in the NIST Handbook 130. An industry representative commented that he is unsure how putting this language into the preamble impacts regulation and enforcement. He commented that this provision might be better served as a standard rather than a regulation. He is concerned what precedent this language sets for weights and measures in relation to the businesses the agency regulates. After considerable discussion, the Committee recommends that this language be referred to PALS for placement into a "Best Practices" document PALS is currently working on. NEWMA recommended that this be an Informational item.

At the 2018 NEWMA Annual Meeting, Mr. Ross Anderson (retired New York regulator) and Mr. Chris Guay (Procter and Gamble) concurred that the Conference make certain it has statutory authority to create a regulation without addressing confusion or a discrepancy in the marketplace. Mr. Anderson stated that the original intent of this item was to preempt establishing any method of sale that is not a "pristine" unit of measure, and believes it sets a bad precedent. Mr. Mike Sikula (New York) opposed the item. NEWMA believed that this agenda item was fully developed and ready for a vote.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to **www.ncwm.net/meetings/annual/publication-16** to review these documents.

MOS-8 V Section 2.13. Polyethylene Products

(This item was Adopted)

Source:
California (2017)

Purpose:
This proposal is to modify the current language to allow for a truncation method for larger non-consumer packages.

Item under Consideration:
Amend the Handbook 130 Uniform Method of Sale of Commodities Regulation as follows:

2.13. Polyethylene Products.

2.13.1. Consumer and Non-Consumer Products. – Offered and exposed for sale shall be sold in the terms given in Section 2.13.1.1. Sheeting and film.

2.13.1.1. Sheeting and Film.

Consumer products shall include quantity statements in both SI and U.S. customary units

Consumer products:

(a) length and width (in SI and U.S. customary units)

(b) area (in square meters and square feet)

(c) thickness (in micrometers and mils [***NOTE 4***, page 117])

(d) weight (in SI and U.S. customary units)

Non-Consumer Products:

(a) length and width (in SI or U.S. customary units)

(b) area (in square meters or square feet)

(c) thickness (in micrometers or mils [***NOTE 4***, page 117])

(d) weight (in SI or U.S. customary units)

(Added 1982) (Amended 1979, 1993, and 1998)

NOTE 4: *1 mil = 0.001 in = 25.4 micrometers (µm). 1 micrometer = 0.000 039 37 in.*
(Amended 1993)

2.13.2. Consumer Products. – At retail shall be sold in the terms given in Section 2.13.2.1. Food wrap, Section 2.13.2.2. Lawn and trash bags, and Section 2.13.2.3. Food and sandwich bags.

2.13.2.1. Food Wrap.

(a) length and width

(b) area in square meters and square feet

(Amended 1979)

2.13.2.2. Lawn and Trash Bags.

(a) count

(b) dimensions

(c) thickness in micrometers and mils

(Amended 1993)

(d) capacity [***NOTE 5***, page 118]

2.13.2.3. Food and Sandwich Bags. – The capacity statement does not apply to fold-over sandwich bags.

(a) count

(b) dimensions

(c) capacity [***NOTE 5***, page 118]

NOTE 5: *See Section 10.8.2. Capacity of the Uniform Packaging and Labeling Regulation*.

2.13.3. Non-consumer Products. – Shall be offered and exposed for sale in the terms given in Section 2.13.3.1. Bags. (Package shall be labeled in SI or U.S. customary units and may include both units.)

(Amended 1998)

2.13.3.1. Bags.

(a) count

(b) dimensions

(c) thickness in micrometers or mils

(d) weight

(e) capacity [***NOTE 5***, page 118]

2.13.4. Declaration of Weight. – The labeled statement of weight for polyethylene sheeting and film products under Sections 2.13.1.1. Sheeting and Film, and 2.13.3.1. Bags, shall be equal to or greater than the weight calculated by using the formula below. ~~**The final value shall be calculated to four digits and declared to three digits, dropping the final digit as calculated (for example, if the calculated value is 2.078 lb, then the declared net weight shall be 2.07 lb).**~~

(Added 1977) (Amended 1980, 1982, 1987, 1989, 1990, 1993, ~~**and**~~ 2012**, and 2018**)

(a) **For values, less than 453.6 kg (1000 lb), the final value shall be calculated to at least four digits and declared to three digits, truncating the final digits as calculated (e.g., a calculated value of 943.1 g [2.079 lb] is truncated to 943 g [2.07 lb]), a calculated value of 14.92 kg (32.89 lb) is truncated to 14.9 kg (32.8 lb), a calculated value of 124.4 kg (274.2 lb) is truncated to 124 kg (274 lb).**

(b) **For values of 453.6 kg (1000 lb) or more, the final value shall be calculated to at least five digits and declared to four digits, truncating the final digits as calculated (e.g., a calculated value of 570.44 kg [1257.6 lb] is truncated to 570.4 kg [1257 lb]).**

(Added 2018)

For SI dimensions:

$M = T \times A \times D/1000$, where:

M = net mass in kilograms
T = nominal thickness in centimeters
A = nominal length in centimeters times nominal width [*NOTE 6*, page 119] in centimeters
D = minimum density in grams per cubic centimeter as defined by the latest version of ASTM Standard D1505, "Standard Test Method for Density of Plastics by the Density-Gradient Technique" and the latest version of ASTM Standard D883, "Standards Terminology Relating to Plastics."

For the purpose of this regulation, the minimum density (D) for linear low-density polyethylene plastics (LLDPE) shall be 0.92 g/cm^3 (when D is not known).

For the purpose of this regulation, the minimum density (D) for linear medium density polyethylene plastics (LMDPE) shall be 0.93 g/cm^3 (when D is not known).

For the purpose of this regulation, the minimum density (D) for high density polyethylene plastics (HDPE) shall be 0.94 g/cm^3 (when D is not known).

For U.S. customary dimensions:

$W = T \times A \times 0.03613 \times D$, where:

W = net weight in pounds
T = nominal thickness in inches;
A = nominal length in inches times nominal width [*NOTE 6*, page 118] in inches
D = minimum density in grams per cubic centimeter as defined by the latest version of ASTM Standard D1505, "Standard Test Method for Density of Plastics by the Density-Gradient Technique" and the latest version of ASTM Standard D883, "Standards Terminology Relating to Plastics."

0.03613 is a factor for converting g/cm^3 to lb/in^3

For the purpose of this regulation, the minimum density (D) for linear low-density polyethylene plastics (LLDPE) shall be 0.92 g/cm^3 (when D is not known).

For the purpose of this regulation, the minimum density (D) for linear medium density polyethylene plastics (LMDPE) shall be 0.93 g/cm^3 (when D is not known).

For the purpose of this regulation, the minimum density (D) for high density polyethylene plastics (HDPE) shall be 0.94 g/cm^3 (when D is not known).

(Added 1977) (Amended 1980, 1982, 1987, 1989, 1990, 1993, and 2018)

NOTE 6: *The nominal width for bags in this calculation is twice the labeled width.*

HB133- Identified editorially changes to harmonize with HB130 language

4.5.2. Test Procedure

a. Test Procedure for Polyethylene Sheeting

1. Follow Section 2.3.1. "Define the Inspection Lot." Use a "Category A" sampling plan in the inspection; select a random sample.

2. Be sure the product is not mislabeled. Check the label declaration to confirm that all of the declared dimensions are consistent with the required standards. The declaration on sheeting, film, and bags shall be equal to or greater than the weight calculated by using the formulas below. ~~**Calculate the final value to four digits and declare to three digits dropping the final digit (e.g., if the calculated value is 2.078 lb, then the declared net weight is truncated to 2.07 lb).**~~

   - **For values, less than 453.6 kg (1000 lb), the final value shall be calculated to at least four digits and declared to three digits, truncating the final digits as calculated (e.g., a calculated value of 943.1 g [2.079 lb] is truncated to 943 g [2.07 lb]), a calculated value of 14.92 kg (32.89 lb) is truncated to 14.9 kg (32.8 lb), a calculated value of 124.4 kg (274.2 lb) is truncated to 124 kg (274 lb).amc**
   - **For values of 453.6 kg (1000 lb) or more, the final value shall be calculated to at least five digits and declared to four digits, truncating the final digits as calculated (e.g., a calculated value of 570.44 kg [1257.6 lb] is truncated to 570.4 kg [1257 lb]).**

   Example:

   Label –

Polyethylene Sheeting
1.82 m (6 ft) × 30.48 m (100 ft)
101.6 µm (4 mil)

3. Use the following formulas to compute a target net weight. The labeled weight should equal or exceed the target net weight or the package is not in compliance **and shall be considered a HB130, Uniform Method of Sale, Section 2.13. Polyethylene Product violation.**

(Amended 2018)

Background/Discussion:

(This item appeared on the 2017 Fall Regional reports as Item 2302-5. On the 2018 NCWM Interim Report it appears as Item MOS-8.

The most efficient means for testing polyethylene products is by weight. The method of truncating the weight value to three digits is suitable for smaller consumer packages, but not for non-consumer products where packages often range in weights from 10 lb to more than 1,000 lb. As currently written, this section limits the calculated weight to three digits for all sizes of packages and will not accommodate heavier packages typically tested at wholesale or production sites. For example, a product with a calculated weight of 1,759 lb would be truncated to 1,750 lb, thus providing a 9 lb allowance. If adopted, the proposed language would correct this error.

At the 2017 NCWM Interim Meeting, Ms. Macey (California) stated that this is important for the mil thickness of bags. The polyethylene test procedure was being reviewed and this change aligns with the test procedure. The Committee moved this forward as a Voting item.

At the 2017 NCWM Annual Meeting, Ms. Macey commented that the language submitted could be clarified. Mr. Andersen (retired New York regulator) stated that when weight is required as part of the method of sale, the weight must be correct. The current formula is a minimum weight factor and is only good to a 1 % variance. Mr. Andersen recommends that the current language providing for three digits remain as is and moving the item along with editorial changes to the test procedure forward but provide recommends providing examples in both the method of sale and test procedure. The NIST Technical Advisor remarked that he is seeking additional information from industry and recommends this be removed from voting status. The Committee concurred that additional work and vetting is needed for this item. For these reasons the Committee removed it from the Voting agenda and de-escalated the status to Informational.

At the 2018 NCWM Interim Meeting, the Committee noted that California and NIST submitted revisions to their original language on December 12, 2017. Mr. Harold Warp (Warp Brothers) remarked that in Section 2.13.4. Declaration of Weights that the Committee recommend providing an example of a product that weighs less than a pound, as well as adding Low Density Polyethylene plastics (LDPE) assigning a minimum density of 0.920 g. As currently stated in this Section both LLDPE and LMDPE are given the same density of 0.93g/cm^3. Mr. Ross Anderson (retired New York regulator) provided clarification that it was to correct the minimum density to 0.92. Mr. Ron Hayes (MO) supported the item, but also suggested the Committee address grain storage bags in a future proposal. The L&R Committee updated the item to include the amended language provided by California and NIST and changed the language from “0.920” to “0.92.” The L&R Committee recommends the amended language as a Voting item.

At the 2018 NCWM Annual Meeting, there were several formatting issues within Publication 16 in Section 4.5.2. which did not reflect the entire label and did not reflect the entire test procedure. The Committee strengthened the language in Step 3 of Section 4.5.2. changing the word “should” to “shall” and rewrote the sentence for clarity. Mr. Andersen commented that this is passable but weights over 1000 lbs go out for significant digits.

Regional Association Comments:
At the 2017 WWMA Annual Meeting, Ms. Lisa Warfield (NIST) commented that there is a group being led by NIST that consists of two polyethylene manufacturers and California Division of Measurement Standards to further develop this proposal. NIST will update the Committee as information is developed and recommends this as an Informational item. The WWMA recommended that this be an Informational item.

At the 2017 SWMA Annual Meeting, the history for this proposal reflects there is concern as it is currently written. Mr. David Sefcik (NIST OWM) has been vetting and working on this proposal with industry and the submitter regarding the concerns that have been documented. A fully developed item will be released by the 2018 NCWM Interim Meeting. The SWMA recommends this as an Informational item.

At the 2017 CWMA Interim Meeting, NIST continues to vet this item with industry. The CWMA recommended that it be an Informational item. At the 2018 CWMA Annual Meeting, Ms. Warfield commented that modifications to the language were submitted to the National L&R on December 12, 2017 and all concerns have been addressed and the language is ready for a vote by membership. The CWMA is recommending this as a Voting item.

At the 2017 NEWMA Interim Meeting, Mr. Ross Anderson who serves on the working group commented that new language that addresses concerns with this issue is not included within the report. The Chairman read an update from NIST, which indicated this item is still in progress and Informational status is recommended. At the 2018 NEWMA Annual Meeting, Mr. Anderson asked NIST to clarify whether this revised version includes the compromised language from the industry. Ms. Lisa Warfield indicted this is the latest version that was developed with industry. NEWMA believes that thus item is fully developed and ready for a vote.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to **www.ncwm.net/meetings/annual/publication-16** to review these documents.

MOS-9 D Electric Watthour

Source:
NIST OWM (2016)

Purpose:

1. Make the weights and measures community aware of work being done within the U.S. National Work Group on Electric Vehicle Fueling and Submetering to develop proposed requirements for electric watthour meters used in submeter applications in residences and businesses;

2. Encourage participation in this work by interested regulatory officials, manufacturers, and users of electric submeters.

3. Allow an opportunity for the USNWG to provide regular updates to the S&T Committee and the weights and measures community on the progress of this work;

4. Allow the USWNG to vet specific proposals as input is needed.

Item Under Consideration:
Create a "Developing Item" for inclusion on the NCWM L&R Committee Agenda (and a corresponding item is proposed for inclusion on the S&T Committee Agenda) where progress of the USNWG can be reported as it develops legal metrology requirements for electric watthour meters and continues work to develop test procedures and test equipment standards.

2.XX. Non-Utility Transactions of Electrical Energy (Other than Vehicle Fueling Applications).

This section applies to non-utility sales of electricity; that is, transactions of electrical energy by other than a utility where the transaction is based in whole or in part on measured quantities of energy delivered.

This section does not apply to:

(a) Electric energy sold in vehicle fueling applications as defined in Section 2.34. Retail Sales of Electricity Sold as a Vehicle Fuel.

(b) Transactions not subject to weights and measures authority.

2.XX.1. Definitions.

2.XX.1.1. Utility. – In this regulation, an entity not subject to weights and measures authority as defined by law or regulation, such as a public utility or municipality or electric cooperative.

2.XX.1.2. Electricity Metering System. - An electricity metering system comprises of components functioning together to measure and register active energy, apparent energy and/or power factor. An electricity metering system may measure alternating current (AC) or direct current (DC) energy.

2.XX.1.3. Demand. – The average rate at which a particular integrated quantity is being supplied to the load. Generally, it is indicated, recorded, or computed as the average obtained over a specified

time interval. Demand is expressed in kilowatts (kW), kilovolt-amperes (kVA), kilovars (kvar), or other suitable units.

2.XX.1.4. Power Factor (PF). – The ratio of the "active power" to "apparent power", in an AC circuit. It describes the efficient use of available power.

2.XX.2. Method of Sale. – All electrical energy offered for sale and sold based on the electrical energy transfer through the electric meter shall be in units specified below.

(a) Active Energy: megajoules (MJ) or kilowatt-hours (kWh)

(b) Apparent Energy: kilovolt-ampere hours (kVAh)

(c) Demand: kilowatts or kilovolt-amperes

Fees may also be assessed for a "power factor (PF)." In addition to the fees assessed for the quantity of electrical energy sold, fees may be assessed for other services, such as taxes and/or fixed fees.

2.XX.3. Unit Price. – The electrical energy unit price shall be in terms of price per unit of measure and in U.S. currency.

(Added 20XX)

Background/Discussion:

(This item appeared on the 2017 Fall Regional reports as Item 2302-11. On the 2018 NCWM Interim and Annual Reports it appears at MOS-9.)

The creation of Developing Items on both the L&R and S&T Committee agendas will provide for a venue to allow the USNWG to update the weights and measures community on continued work to develop test procedures and test equipment standards. This item will provide a forum for reporting on work to develop proposed method of sale requirements for electric watthour meters and a tentative device code for electric watthour meters in residential and business locations and serve as a placeholder for eventual submission of these proposals for consideration by NCWM.

The U.S. National Work Group (USNWG) on Electric Watt Hour Meters (WHE) Meters met (and by Tele/web conference) on September 12-14, 2017 in Sacramento, California to discuss the full development of a November 2014 version of a watthour meter draft code, intended to address legal metrology requirements for the device its minimum inspection and test procedures and test equipment, the appropriate method of sale of electricity through the device and an efficient process for achieving these goals.

At the 2018 NCWM Annual Meeting, Ms. Tina Butcher (NIST, OWM) provided an update that the USNWG, Electric Watthour Meter Subgroup has held several in-person meetings since the 2017 NCWM Annual Meeting, including meetings in September 2017, November 2017, and May 2018. All meetings included web-conferencing to allow those not able to attend in person to participate. The Subgroup will meet for a short web-conference on August 29, 2018 and is planning its next in-person meeting for February 2019 in Sacramento, California.

The Subgroup has submitted an item under consideration to NIST Handbook 130's Uniform Regulation for the Method of Sale of Commodities to specify a method of sale for electrical energy sold through these systems and recently finalized a Subgroup ballot on language to be presented for consideration by the Regional W&M Associations and the NCWM in the 2019 NCWM cycle. The Subgroup looks forward to comments on the proposed language as it moves through the process. Although, the Subgroup understands there may be a need to make some technical and editorial changes as these comments are received, the Subgroup expects the proposal will be ready for vote by the NCWM at the 2019 Annual Meeting.

The USNWG will provide regular updates on the progress of this work and welcomes input from the community.

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or

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Regional Association Comments:
At the 2017 WWMA Annual Meeting, Ms. Lisa Warfield (NIST and Chair of USNWG) commented that draft language was developed at the Watthour Submetering USNWG held in California, September 13-15, 2017. This language will be used primarily in California. It was requested that Ms. Macey (California) vet the language with California counties and provide feedback at the 2018 NCWM Interim Meeting. Committee were not able to view this language, they recommend it remain a Developing Item.

At the 2017 SWMA Annual Meeting, the SWMA recommended that this item remain a Developing item.

At the 2018 CWMA Annual Meeting, they recommend that it remain a Developing item

At the 2017 NEWMA: No comments were heard and NEWMA recommends that this item remain Developing. At the 2018 NEWMA Annual Meeting, Ms. Warfield commented the Electric Watthour Group met last week in Sacramento, CA (May 2018). At last week's meeting, the group made some minor changes to the language and prior to it being sent to NCWM, it will need to be balloted by the EVSE subgroup. NEWMA recommends that this item remain Developmental.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to **www.ncwm.net/meetings/annual/publication-16** to review these documents.

MOS-10 V Section 2.XX. – Pet Treats or Chews

(This item was Adopted)

Source:
NIST OWM (2018)

Purpose:
There is considerable confusion in the marketplace to how animal treats and bones are to be labeled. This would provide specific guidance to how the package should be labeled.

Item under Consideration:
Amend NIST Handbook 130 Uniform Method of Sale of Commodities Regulation as follows:

2.XX. – Pet Treats or Chews - Digestible chews, rawhides, bones, biscuits, antlers or similar type products shall be sold by weight.
(Added 2018)

Background/Discussion:

(This item appeared on the 2017 Fall Regional reports as Item NEW-18. On the 2018 NCWM Interim Report it appears as Item. MOS-10.)

Add language to the method of sale for animal treats. Animal treats has been one of the fastest growing areas in the marketplace. However, there is considerable mislabeling in the marketplace. The NIST/OWM has numerous calls from inspectors and manufacturers as to the proper labeling for animal treats.

There could be some opposition from manufacturers. If this is the case, a labeling implementation date should be granted.

At the 2018 Interim Meeting, one regulator commented to add the word “net” before “weight” in the language. The L&R Committee decided this was inconsistent with other sections of the handbook, including method of sale and definitions. The L&R Committee believes the current language is fully developed and recommends it as a Voting item.

Regional Association Comments:

At the 2017 WWMA Annual Meeting, this item did not appear as part of their 2017 WWMA meeting agenda, but the Committee agreed to consider it, and believes it is fully developed and ready for Voting status.

At the 2017 SWMA Annual Meeting, membership was told that pet treats or chews is one of the fastest growing marketplaces. States have noticed considerable mislabeled packaging for animal treats and chews. FDA does have federal regulations (refer to NCWM L&R Supporting Documents) that state, if the pet treats or chews have nutritional value they must be sold by net weight. This proposal will add a specific method of sale that clearly specifies what the method of sale is for pet treats and chews that have nutritional value. There is additional background information and a copy of the CFR on the NCWM Website. The SWMA believes this item is fully developed and recommends it as a Voting item.

A the 2017 CWMA Interim Meeting a Wisconsin regulator commented that she supports adding this language to Handbook 130. She says she had seen a variety of ways pet treats are sold – by count, by net weight, by size, etc. Net weight statements should be required. The CWMA recommended that this be a Voting item. At the 2018 CWMA Annual Meeting, Ms. Lisa Warfield, NIST Technical Advisor, commented that the NIST office receives several calls regarding regulation on pet treats and chews. This item is fully developed and ready for voting status. Rachelle Miller, Wisconsin regulator, supports this item.

At the 2017 NEWMA Interim Meeting, Mr. Ross Andersen (retired New York Regulator) commented that this item was proposed to the wrong section of the Handbook. It should be placed into the Method of Sale section and the word “net” should appear before weight. He also recommends this be a Voting item. NEWMA recommended it be a Voting item as amended here:

> **11.XX. – Pet Treats or Chews - Digestible chews, rawhides, bones, biscuits, antlers or similar type products that are defined as having nutritional value under FDA and 21 CFR 501 shall be sold by net weight.**

At the 2018 NEWMA Annual Meeting no comments were heard on this item and the Committee recommends it for a Vote.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to **www.ncwm.net/meetings/annual/publication-16** to review these documents.

FLR – UNIFORM ENGINE FUELS AND AUTOMOTIVE LUBRICANTS REGULATION

FLR-8 W Section 4.1. Water in Retail Engine Fuel Storage Tanks, ~~Gasoline-Alcohol Blends, Biodiesel Blends, Ethanol Flex Fuel, Aviation Gasoline, and Aviation Turbine Fuel.~~ ~~and Section 4.2. Water in Gasoline, Diesel, Gasoline-Ether, and Other Fuels.~~

(This item was Withdrawn.)

Source:
State of Colorado (2016)

Purpose:
Provide a consistent best management practice with regard to managing water in any engine fuel utilizing current detection technology.

Item under Consideration:
Amend NIST Handbook 130, Uniform Engine Fuels and Automotive Lubricants Regulation as follows:

> **4.1. Water in Retail Engine Fuel Storage Tanks ~~Gasoline-Alcohol Blends, Biodiesel Blends, Ethanol Flex Fuel, Aviation Gasoline, and Aviation Turbine Fuel.~~** No water phase greater than 6 mm (¼ in) as determined by an appropriate detection paste or other acceptable means, is allowed to accumulate in any **retail** tank utilized in the storage of **engine fuels including, gasoline,** gasoline-alcohol blend, biodiesel, biodiesel blends, **ultra-low sulfur diesel,** ethanol flex fuel, aviation gasoline, and aviation turbine fuel**, gasoline ether blends, kerosene, or any other engine fuels**.
>
> (Amended 2008, 2012, ~~**and**~~ 2014**, and 20XX**)
>
> ~~**4.2. Water in Gasoline, Diesel, Gasoline-Ether, and Other Fuels. Water shall not exceed 25 mm (1 in) in depth when measured with water indicating paste or other acceptable means in any tank utilized in the storage of diesel, gasoline, gasoline-ether blends, and kerosene sold at retail except as required in Section 4.1. Water in Gasoline-Alcohol Blends, Biodiesel Blends, Ethanol Flex Fuel, Aviation Gasoline, and Aviation Turbine Fuel.**~~
>
> ~~**(Amended 2008, 2012, and 2014)**~~

Background/Discussion:

(This item appeared on the 2017 Fall Regional reports as Item 2307-3. In the 2018 NCWM Interim and Annual Reports it appears as FLR-8.)

All engine fuels degrade more rapidly in the presence of water, and can result in off spec product, microbial growth and internal corrosion of tanks and tank equipment. Besides impacting the quality of fuel such as when ethanol dissolves in water causing phase separation, affecting RVP and reducing AKI or octane number, the occurrence of microbial growth and corrosion particulates clog dispenser filters and affect other fuel clarity parameters. The fuels landscape has changed significantly across the country and currently almost all gasoline is blended with ethanol and all diesel is now Ultra Low Sulfur Diesel with up to five percent biodiesel. This proposal provides a consistent best management practice for managing water in any engine fuel utilizing current detection technology (water finding paste or other acceptable means) and simplifies the handbook by eliminating the necessity for Section 4.2. Water in Gasoline, Diesel, Gasoline Ether, and Other Fuels.

At the 2016 NCWM Interim Meeting, Dr. Curran (FALS Chairman) remarked that FALS is forming a focus group lead by Mr. Albuquerque (CO) for developing this item. Bill Hornback (Chevron Products Co.) remarked that this is no way to detect ¼ in water. The Committee agrees that additional work needs to be done and recommends this as an Informational item.

At the 2016 NCWM Annual Meeting, Mahesh Albuquerque (focus group chair) gave a presentation regarding water in fuel storage tanks. Mr. Albuquerque will continue to develop this item through the informational focus group and report back to FALS on their progress.

At the 2017 NCWM Interim Meeting, Mr. Mahesh Albuquerque provided an update to the FALS. Mr. Albuquerque noted that this proposal arose because there are two different requirements in the Handbooks regarding permissible levels of water in fuel storage tanks and he was looking to harmonize them to one quarter inch. He gave a presentation highlighting some of the research that has been conducted regarding the effects of water in fuel storage tanks. Much discussion ensued and one of the overarching lingering questions left before group was if this was worth the cost of implementation. The focus group plans to continue to evaluate this and other related questions in hopes to have a resolution ready to move forward soon.

At the 2018 NCWM Interim Meeting Mahesh Albuquerque (focus group chair) for this item provided an update that with the introduction of ultra-low sulfur diesel, storage tanks have developed much more corrosion caused by microbial growth created in water. He further commented that there is work being done by CRC on the cause of corrosion in storage tanks and recommends the item be Withdrawn until further data is available. The L&R Committee recommends this item be Withdrawn based upon the information from the submitter.

Regional Association Comments:
At the 2017 WWMA Annual Meeting, the Committee recommends further development and data gathering on this item as an Informational item and looks forward to hearing results of the CRC study and the work of the focus group.

At the SWMA Annual Meeting, the SWMA looks forward to hearing an update from Mr. Albuquerque, Focus Group Chairman.

At the 2017 CWMA Interim Meeting, a representative from the National Biodiesel Board (NBB) commented that she supports the concept of making requirements that all fuels have the same minimum water allowance. A regulator (Kansas) asked is data that quantifies whether there is an economic difference in mitigating free water levels such as ¼ inch versus 1 inch? Scott Fenwick (NBB and the future ASTM D02 Chair) commented that there are studies from Battelle, CRC, EPA, and many others showing a significant economic impact from free water and fuel. He stated that free water detected at any level needs to be addressed. A state regulator (Illinois) asked whether biodiesel blends up to and including B5 would be considered a biofuel or petroleum fuel? A regulator (Kansas) asked the hygroscopic differences between biodiesel and petroleum diesel. The problem always results in free water, not in water absorbed in the fuel. The Illinois regulator commented that even without free water, there is water in the fuel that will degrade the fuel. A representative from BP commented she would like to see the current CRC study. A state regulator (Missouri) commented that filters would resolve many water issues in fuel. The CWMA recommended that this be an Informational item.

At the 2017 NEWMA Interim Meeting, it was spoken that FALS continues to work on this issue through an informal work group and the submitter of the item. NEWMA recommends this item remain Informational.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to **www.ncwm.net/meetings/annual/publication-16** to review these documents.

FLR-9 V G. Uniform ~~Engine~~ Fuels and Automotive Lubricants Regulation

(This item was Adopted)

Source:
NCWM Fuels and Lubricants Subcommittee (2018)

Purpose:
Update NIST Handbook 130 Chapter G, Uniform Engine Fuels and Automotive Lubricants Regulation.

Item under Consideration:
Amend NIST Handbook 130, Uniform Engine Fuels and Automotive Lubricants Regulation as follows:

G. Uniform ~~Engine~~ Fuels and Automotive Lubricants Regulation

as adopted by
The National Conference on Weights and Measures*

1. Background

In 1984, the National Conference on Weights and Measures (NCWM) adopted a Section 2.20. in the Uniform Regulation for the Method of Sale of Commodities requiring that motor fuels containing alcohol be labeled to disclose to the retail purchaser that the fuel contains alcohol. The delegates deemed this action necessary since motor vehicle manufacturers were qualifying their warranties with respect to some gasoline-alcohol blends, motor fuel users were complaining to weights and measures officials about fuel quality and vehicle performance, and ASTM International (ASTM) had not yet finalized quality standards for oxygenated (which includes alcohol-containing) fuels. While a few officials argued weights and measures officials should not cross the line from quantity assurance programs to programs regulating quality, the delegates were persuaded that the issue needed immediate attention.

A Motor Fuels Task Force was appointed in 1984 to develop mechanisms for achieving uniformity in the evaluation and regulation of motor fuels. The Task Force developed the Uniform Motor Fuel Inspection Law (see the Uniform Engine Fuels and Automotive Lubricants Inspection Law section of this handbook) and the Uniform Engine Fuel and Automotive Lubricants Regulation to accompany the law. The Uniform Law required registration and certification of motor fuel as meeting ASTM standards. The regulation defined the ASTM standards to be applied to motor fuel.

In 1992, the NCWM established the Petroleum Subcommittee under the Laws and Regulations Committee. The subcommittee recommended major revisions to the Regulation that was adopted at the 80th NCWM in 1995. The scope of the regulation was expanded to include all engine fuels, petroleum products, and automotive lubricants; its title was changed accordingly; and the fuel specifications and method of sale sections were revised to address the additional products. Other changes included expansion of the definitions section and addition of sections on retail storage tanks, condemned product, registration of engine fuels designed for special use, and test methods and reproducibility limits.

In 2007, the Petroleum Subcommittee (now referred to as the Fuels and Lubricants Subcommittee) undertook a review of this regulation to update it by eliminating reference to "petroleum products" and to reflect the addition of new engine fuels to the marketplace. **The regulation continues to be updated to incorporate new regulatory requirements and other key changes.**

~~At the 2008 NCWM Interim Meeting, the Laws and Regulations Committee changed the Petroleum Subcommittee's name to the Fuels and Lubricants Subcommittee (FALS) in recognition of its work with a wide variety of fuels including petroleum and biofuels.~~
(Amended 2018)

2. Status of Promulgation

The Uniform Regulation for Engine Fuels and Automotive Lubricants was adopted by the NCWM in 1995. The status of state actions with respect to this Regulation is shown in the table beginning on page 6.

(Amended 2008)

Section 1. Definitions

1.1. ASTM (ASTM International (www.astm.org) – The international voluntary consensus standards organization formed for the development of standards on characteristics and performance of materials, products, systems, and services, and the promotion of related knowledge.

1.2. Antiknock Index (AKI). – The arithmetic average of the Research Octane Number (RON) and Motor Octane Number (MON): AKI = (RON+MON)/2. This value is called by a variety of names, in addition to antiknock index, including: octane rating, posted octane, (R+M)/2 octane.

1.3. Automatic Transmission Fluid. – A product intended for use in a passenger vehicle, other than a bus, as either lubricant, coolant, or liquid medium in any type of fluid automatic transmission that contains a torque converter. For the purposes of this regulation, fluids intended for use in continuously variable transmissions are not considered "Automatic Transmission Fluid."

(Added 2004)

1.4. Automotive Fuel Rating. –The automotive fuel rating required under the amended ~~Octane~~ **Automotive Fuel Ratings, Certification and Posting Rule** (or as amended, the Fuel Rating Rule), 16 CFR 306. Under this Rule, sellers of liquid automotive fuels, including alternative fuels, must determine, certify, and post an appropriate automotive fuel rating. The automotive fuel rating for gasoline **and gasoline-oxygenate blends** is the antiknock index (octane rating). The automotive fuel rating for alternative liquid **automotive** fuels consists of the common name of the fuel, along with a disclosure of the amount, expressed as a minimum volume percent of the principal component of the fuel. For alternative liquid automotive fuels, a disclosure of other components, expressed as a minimum volume percent, may be included, if desired.

(Amended 2018)

1.5. Automotive Gasoline, Automotive Gasoline-Oxygenate Blend. – A type of fuel suitable for use in spark ignition automobile engines **containing small amounts of fuel additives** and also commonly used in marine and non-automotive applications.

(Amended 2018)

1.6. Aviation Gasoline. – A type of gasoline suitable for use as a fuel in an aviation spark-ignition internal combustion engine.

1.7. Aviation Turbine Fuel. – A refined middle distillate suitable for use as a fuel in an aviation gas turbine internal combustion engine.

~~**1.8. Base Gasoline. – All components other than ethanol in a blend of gasoline and ethanol.**~~

1.~~9~~8. Biodiesel. – A fuel comprised of **at least 99% by volume** mono-alkyl esters of long chain fatty acids derived from vegetable oils or animal fats, designated B100 **or B99**.

(Amended 2018)

1.~~10~~9. Biodiesel Blend. – A fuel comprised of a blend of biodiesel **with hydrocarbon diesel fuel.** ~~**fuel with petroleum-based diesel fuel, designated BXX. In the abbreviation BXX, (e.g., B20) represents the volume percentage of biodiesel fuel in the blend.**~~

(Amended 2018)

1.10. Butanol. – Butyl alcohol, the chemical compound C_4H_9OH, a colorless substance existing in four isomeric forms.

(Added 2018)

1.11. Cetane Number. – A numerical measure of the ignition performance of a diesel fuel obtained by comparing it to reference fuels in a standardized engine test.

1.12. Compressed Natural Gas (CNG). –Natural gas which has been compressed and dispensed into fuel storage containers and is suitable for use as an engine fuel.

1.13. Denatured Fuel Ethanol. –An ethanol blend component for use in gasoline-ethanol blends and ethanol flex fuel. The ethanol is rendered unfit for beverage use by the addition of denaturants under formulas approved by the Alcohol and Tobacco Tax and Trade Bureau (TTB) (**www.ttb.gov**), by the latest version of ASTM D4806, "Standard Specification for Denatured Fuel Ethanol for Blending with Gasolines for Use as Automotive Spark Ignition Engine Fuel" describes the acceptable denaturants for denatured fuel ethanol to be blended into spark ignition engine fuels.

(Amended 2014)

1.14. Diesel Exhaust Fluid (DEF). – A preparation of aqueous urea [(NH2)2CO], containing 32.5 % by mass of technically-pure urea in high-purity water with quality characteristics defined by the latest version of ISO 22241, "Diesel engines – NOx reduction agent AUS 21."

(Added 2014)

1.15. Diesel Fuel. – A refined ~~**middle distillate**~~ **hydrocarbon** suitable for use as a fuel in a compression-ignition (diesel) internal combustion engine**, that may contain a combination of biodiesel, renewable diesel, and fuel additives.**

(Amended 2018)

1.16. Director. – The Director, Commissioner, or other authority having jurisdiction over a Department and/or their designated agent(s).

(Added 20XX)

1.~~16~~17. Distillate. –Any product obtained by condensing the vapors given off by boiling petroleum or its products.

1.~~17~~18. EPA. –The United States Environmental Protection Agency (**www.epa.gov**).

1.19. Energy Institute (EI) (https://knowledge.energyinst.org/). – A professional organization for the energy industry, developing standards and other technical documents.

(Added 2018)

1.~~18~~20. Engine Fuel. – Any liquid or gaseous matter used for the generation of power in an internal combustion engine.

1.~~19~~21. Engine Fuels Designed for Special Use. – Engine fuels designated by the Director as requiring registration. These fuels normally do not have ASTM or other national consensus standards applying to their quality or usability; common special fuels are racing fuels and those intended for agricultural and other off-road applications.

1.~~20~~22. Ethanol. – Also known as "ethyl alcohol." Ethanol is provided in gasoline-ethanol blends by blending denatured fuel ethanol. See Section 1.13., Denatured Fuel Ethanol.

(Amended 2014)

1.~~21~~23. Ethanol Flex Fuel. – Blends of ethanol and hydrocarbons restricted for use as fuel in ground vehicles equipped with flexible-fuel spark-ignition engines.

(Amended 2014)

1.24. Flexible-Fuel Vehicle. – A vehicle designed to operate on either unleaded gasoline or ethanol flex fuel or mixtures of both. Flexible-fuel vehicles may also be designed to run on M85 Fuel Methanol.

(Added 2018)

1.25. Fuel Additive. – A material added to a fuel in small amounts to impart or enhance desirable properties or to suppress undesirable properties.
(Added 2018)

1.~~22~~26. Fuel Cell. –An electrochemical energy conversion device in which fuel and an oxidant react to generate electricity without consumption, physically or chemically, of its electrodes or electrolytes.

(Added 2012)

1.~~23~~27. Fuel Oil. – Refined oil middle distillates, heavy distillates, or residues of refining, or blends of these, suitable for use as a fuel for heating or power generation~~**, the classification of which shall be defined by the latest version of ASTM D396**~~.

(Amended 2018)

1.~~24~~28. Gasoline. –A volatile mixture of liquid hydrocarbons ~~**generally**~~ containing small amounts of additives suitable for use as a fuel in a spark-ignition internal combustion engine.

(Amended 2018)

~~**1.25. Gasoline-Alcohol Blend. – A fuel consisting primarily of gasoline and a substantial amount (more than 0.35 mass percent of oxygen, or more than 0.15 mass percent of oxygen if methanol is the only oxygenate) of one or more alcohols.**~~

~~**1.26. Gasoline Gallon Equivalent (GGE). – Equivalent to 2.567 kg (5.660 lb) of natural gas.**~~

~~**1.27. Gasoline Liter Equivalent (GLE). – Equivalent to 0.678 kg (1.495 lb) of natural gas.**~~

1.~~28~~29. Gasoline-Oxygenate Blend. – A fuel consisting primarily of gasoline along with a substantial amount (more than ~~**0.35 mass percent of oxygen**~~ **1 % by volume oxygenate**, or more than ~~**0.15 mass percent of oxygen if**~~ **0.3 % by volume** methanol**)** ~~**is the only oxygenate) of one or more oxygenates.**~~ **not to exceed the total oxygen content permitted by applicable laws and regulations. Examples of oxygenates used in gasoline-alcohol blends are ethanol and butanol.**

(Amended 2018)

1.~~29~~30. Gear Oil. –An oil used to lubricate gears, axles, or some manual transmissions.

(Added 2004)

1.3~~0~~1. Hydrogen Fuel. –A fuel composed of molecular hydrogen intended for consumption in a surface vehicle or electricity production device with an internal combustion engine or fuel cell.

(Added 2012)

1.~~31~~32. Internal Combustion Engine. –A device used to generate power by converting chemical energy bound in the fuel via spark-ignition or compression ignition combustion into mechanical work to power a vehicle or other device.

(Added 2012)

1.33. International Organization for Standardization (ISO) (www.iso.org). – An independent international organization with a membership of national standards bodies.

(Added 2018)

1.~~32~~34. Kerosene. – (or "Kerosine") A refined middle distillate suitable for use as a fuel for heating or illuminating**.**~~,~~ ~~**the classification of which shall be defined by the latest version of ASTM D3699, "Standard Specification for Kerosine."**~~

(Amended 2018)

1.~~33~~35. Lead Substitute. – An EPA-registered gasoline additive suitable, when added in small amounts to fuel, to reduce or prevent exhaust valve recession (or seat wear) in automotive spark-ignition internal combustion engines designed to operate on leaded fuel.

1.~~34~~36. Lead Substitute Engine Fuel. – For labeling purposes, a gasoline or gasoline-oxygenate blend that contains a "lead substitute".

~~**1.35. Leaded. – For labeling purposes, any gasoline or gasoline-oxygenate blend which contains more than 0.013 g of lead per liter (0.05 g lead per U.S. gal).** ***NOTE: EPA defines leaded fuel as one which contains more than 0.0013 g of phosphorus per liter (0.005 g per U.S. gal), or any fuel to which lead or phosphorus is intentionally added.***~~

1.~~36~~37. Liquefied Natural Gas (LNG). – Natural gas that has been liquefied at – 162 °C (– 260 °F) and stored in insulated cryogenic tanks for use as an engine fuel.

(Amended 2016)

1.~~37~~38. Liquefied Petroleum Gas (LPG). –A mixture of normally gaseous hydrocarbons, predominantly propane, or butane, or both, that has been liquefied by compression or cooling, or both to facilitate storage, transport, and handling.

1.~~38~~39. Low Temperature Operability. –A condition which allows the uninterrupted operation of a diesel engine through the continuous flow of fuel throughout its fuel delivery system at low temperatures. Fuels with adequate low temperature operability characteristics have the ability to avoid wax precipitation and clogging in fuel filters.

(Added 1998) (Amended 1999)

1.~~39~~40. Lubricant. – Oil. (See **~~1.45.~~ 1.46.** Oil below.).

(Added 2008)

1.~~40~~41. Lubricity. –A qualitative term describing the ability of a fluid to affect friction between, and wear to, surfaces in relative motion under load.

(Added 2003)

1.~~41~~42. M85 Fuel Methanol. – A blend of methanol and hydrocarbons of which the methanol portion is nominally 70 to 85 volume percent.

1.~~42~~43. Motor Octane Number. –A numerical indication of a spark-ignition engine fuel's resistance to knock obtained by comparison with reference fuels in a standardized ASTM D2700, "Motor Method Engine Test."

1.~~43~~44. Motor Oil. –An oil that reduces friction and wear between the moving parts within a reciprocating internal combustion engine and also serves as a coolant. For the purposes of this regulation, "vehicle motor oil" refers to motor oil which is intended for use in light- to heavy-duty vehicles including cars, sport utility vehicles, vans, trucks, buses, and off-road farming and construction equipment. For the purposes of this regulation, "recreational motor oil" refers to motor oil which is intended for use in four-stroke cycle engines used in motorcycles, ATVs, and lawn and garden equipment. For the purposes of this regulation, motor oil also means engine oil.

(Added 2004)

1.~~44~~45. MTBE. –Methyl tertiary-butyl ether, **the chemical compound $(CH_3)_3COCH_3$ [$C_5H_{12}O$].**

(Added 2008) **(Amended 2018)**

1.~~45~~46. Oil. –A motor oil, engine oil, and/or gear oil.

(Added 2004)

1.~~46~~47. Oxygen Content of Gasoline. –The percentage of oxygen **~~by mass~~** contained in a gasoline.

(Amended 2018)

1.~~47~~48. Oxygenate. –An oxygen-containing, ashless, organic compound, such as an alcohol or ether, which can be used as a fuel or fuel supplement.

1.49. Racing Gasoline. – A specialty fuel typically used in non-road racing vehicles that is generally of lower volatility, has a narrower boiling range and a higher octane rating than gasolines made for use in conventional passenger vehicles.

(Added 2018)

~~1.48. Reformulated Gasoline (RFG). –A gasoline or gasoline-oxygenate blend certified to meet the specifications and emission reduction requirements established by the Clean Air Act Amendments of 1990, as amended by the Energy Policy Act of 2005, required to be sold for use in automotive vehicles in extreme and severe ozone non-attainment areas and those areas which opt to require reformulated gasoline.~~

~~(Amended 2008)~~

1.~~49~~50. Research Octane Number. –A numerical indication of a spark-ignition engine fuel's resistance to knock obtained by comparison with reference fuels in a standardized ASTM D2699, "Research Method Engine Test."

1.~~50~~51. SAE (SAE International) (www.sae.org). –A technical organization for engineers, scientists, technicians, and others who cooperate closely in the engineering, design, manufacture, use, and maintainability of self-propelled vehicles.

~~**1.51. Substantially Similar. –Refers to the EPA's "Substantially Similar" rule, Section 211 (f) (1) of the Clean Air Act [42 U.S.C. 7545 (f) (1)].**~~

1.52. ~~ThermStability~~ Thermal Stability. –The ability of a fuel to resist the thermal stress which is experienced by the fuel when exposed to high temperatures in a fuel delivery system. Such stress can lead to formation of insoluble gums or organic particulates. Insolubles (e.g., gums or organic particulates) can clog fuel filters and contribute to injector deposits.

(Added 1998) (Amended 1999 **and 2018**)

1.53. Unleaded. –When used in conjunction with "engine fuel" or "gasoline" means any gasoline or gasoline-oxygenate blend to which no lead or phosphorus compounds have been intentionally added and which contains not more than 0.013 g of lead per liter (0.05 g lead per U.S. gallon) and not more than 0.0013 g of phosphorus per liter (0.005 g phosphorus per U.S. gallon).

1.54. Wholesale Purchaser Consumer. –Any person who is an ultimate consumer of gasoline, fuel methanol, ethanol flex fuel, diesel fuel, biodiesel, biodiesel blends, fuel oil, kerosene, aviation turbine fuels, natural gas, compressed natural gas, or liquefied petroleum gas and who purchases or obtains the product from a supplier and receives delivery of that product into a storage tank.

(Added 1998) (Amended 1999 and 2014)

Section 2. Standard ~~Fuel~~ Specifications

2.1. Gasoline and Gasoline-Oxygenate Blends.

2.1.1. Gasoline and Gasoline-Oxygenate Blends (as defined in this regulation). – Shall meet the latest version of ASTM D4814, "Standard Specification for Automotive Spark-Ignition Engine Fuel" except for the permissible offsets for ethanol blends as provided in Section 2.1.2. Gasoline-Ethanol Blends.

(Added 2009)

(a) The maximum concentration of oxygenates contained in gasoline-oxygenate blends shall not exceed those permitted by the EPA under Section 211 of the Clean Air Act and applicable waivers.

(Added 2018)

2.1.2. Gasoline-Ethanol Blends. –When gasoline is blended with **denatured fuel** ethanol, the **denatured fuel** ethanol shall meet the latest version of ASTM D4806, "Standard Specification for Denatured Fuel Ethanol for Blending with Gasolines for Use as Automotive Spark-Ignition Engine Fuel," and the blend shall meet the latest version of ASTM D4814, "Standard Specification for Automotive Spark-Ignition Engine Fuel," with the following permissible exceptions:

a. The maximum vapor pressure shall not exceed the ASTM D4814 limits by more than:

(1) 1.0 psi for blends containing 9 to 10 volume percent ethanol from June 1 through September 15 **as allowed by the EPA.**

~~(2) **1.0 psi for blends containing one or more volume percent ethanol for volatility classes A, B, C, D from September 16 through May 31.**~~

~~(3) **0.5 psi for blends containing one or more volume percent ethanol for volatility Class E from September 16 through May 31.**~~

~~**The vapor pressure exceptions in subsections 2.1.2. Gasoline-Ethanol Blends will remain in effect until May 1, 2017, or until ASTM incorporates changes to the vapor pressure maximums for ethanol blends, whichever occurs earlier. (Effective July 28, 2016)**~~

(Amended 2016 **and 2018**)

~~***NOTE 1: The temperature values (e.g., 54 °C, 50. °C, 41.5 °C) are presented in the format prescribed in ASTM E29 "Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications."***~~

NOTE ~~2~~ 1: *The values shown above appear only in U.S. customary units to ensure that the values are identical to those in ASTM standards and the Environmental Protection Agency regulation.*
(Added 2009)(Amended 2012, and 2016)

2.1.3. Minimum Antiknock Index (AKI). – The AKI shall not be less than the AKI posted on the product dispenser or as certified on the invoice, bill of lading, shipping paper, or other documentation.;

2.1.4. Minimum Motor Octane Number. –The minimum motor octane number shall not be less than 82 for gasoline with an AKI of 87 or greater;

~~**2.1.5. Minimum Lead Content to Be Termed "Leaded."** – **Gasoline and gasoline oxygenate blends sold as "leaded" shall contain a minimum of 0.013 g of lead per liter (0.05 g per U.S. gallon);**~~

2.1.~~6~~5. Lead Substitute Gasoline. –Gasoline and gasoline-oxygenate blends sold as "lead substitute" gasoline shall contain a lead substitute which provides protection against exhaust valve seat recession equivalent to at least 0.026 g of lead per liter (0.10 g per U.S. gallon).

2.1.~~6~~5.1. Documentation of Exhaust Valve Seat Protection. – Upon the request of the Director, the lead substitute additive manufacturer shall provide documentation to the Director that demonstrates that the treatment level recommended by the additive manufacturer provides protection against exhaust valve seat recession equivalent to or better than 0.026 g/L (0.1 g/gal) lead. The Director may review the documentation and approve the lead substitute additive before such additive is blended into gasoline. This documentation shall consist of:

(a) test results as published in the Federal Register by the EPA Administrator as required in Section 211(f)(2) of the Clean Air Act; or

(b) until such time as the EPA Administrator develops and publishes a test procedure to determine the additive's effectiveness in reducing valve seat wear, test results and description of the test procedures used in comparing the effectiveness of 0.026 g per liter lead and the recommended treatment level of the lead substitute additive shall be provided.

2.1.~~7~~6. Blending. –Leaded, lead substitute, and unleaded gasoline-oxygenate blends shall be blended according to the EPA "substantially similar" rule or an EPA waiver for unleaded fuel.

(Amended 2009)

2.2. Diesel Fuel. – Shall meet the ~~**latest version of ASTM D975, "Standard Specification for Diesel Fuel Oils."**~~ **following requirements, based on the biodiesel concentration of the fuel:**

(a) Diesel fuel that contains less than or equal to 5 % by volume biodiesel shall meet the latest version of ASTM D975, "Standard Specification for Diesel Fuel Oils" and shall be sold as diesel fuel.

(b) Diesel fuel that contains greater than or equal to 6 % by volume biodiesel and that contains less than or equal to 20 % by volume shall meet the latest version of ASTM D7467, "Standard Specification for Diesel Fuel Oil, Biodiesel Blend (B6 to B20)."

(c) Only fuel additives registered with the US EPA may be used to additize diesel fuel and the final product must meet ASTM D975 and/or ASTM D7467.

(Amended 2018)

2.2.1. Premium Diesel Fuel. – All diesel fuels identified on retail dispensers, bills of lading, invoices, shipping papers, or other documentation with terms such as premium, super, supreme, plus, or premier must conform to the following requirements:

(a) **Cetane Number.** – A minimum cetane number of 47.0 as determined by the latest version of ASTM D613, "Standard Test Method for Cetane Number of Diesel Fuel Oil."

(b) **Low Temperature Operability.** – A cold flow performance measurement which meets the latest version of ASTM D975, "Standard Specification for Diesel Fuel Oils," tenth percentile minimum ambient air temperature charts and maps by either ASTM Standard Test Method D2500 (Cloud Point) or the latest version of ASTM Standard D4539, "Low Temperature Flow Test, LTFT." Low temperature operability is only applicable October 1 to March 31 of each year.

(c) **Thermal Stability.** – A minimum reflectance measurement of 80 % as determined by the latest version of ASTM Standard Test Method D6468 (180 min, 150 °C).

(d) **Lubricity.** – A maximum wear scar diameter of 520 micrometers as determined by the latest version ASTM D6079, "Standard Test Method for Evaluating Lubricity of Diesel Fuels by the High-Frequency Reciprocating Rig (HFRR)." If an enforcement jurisdiction's single test of more than 560 micrometers is determined, a second test shall be conducted. If the average of the two tests is more than 560 micrometers, the sample does not conform to the requirements of this part.

(Amended 2003)

2.3. Aviation Turbine Fuels. –Shall meet the latest version of ~~**ASTM D1655, "Standard Specification for Aviation Turbine Fuels."**~~ **the following standards, as appropriate:**

(a) ASTM D1655, "Standard Specification for Aviation Turbine Fuels."

(b) ASTM D6615, "Standard Specification for Jet B Wide-Cut Aviation Turbine Fuel."

(c) ASTM D7223, "Standard Specification for Aviation Certification Turbine Fuel."

(d) ASTM D7566, "Standard Specification for Aviation Turbine Fuel Containing Synthesized Hydrocarbons."

(Amended 2018)

2.4. Aviation Gasoline. – Shall meet the latest version of one of the following, as appropriate:

(a) ASTM D910, "Standard Specification for **Leaded** Aviation Gasoline;" ~~**or**~~

(b) ASTM D6227, "Standard Specification for Grade 82 Unleaded Aviation Gasoline~~.~~**;**" **or**

(c) **ASTM D7547, "Standard Specification for Hydrocarbon Unleaded Aviation Gasoline."**
(Added 20XX)

(Amended 2008 **and 20XX**)

2.5. Fuel Oils. –Shall meet the latest version of ASTM D396, "Standard Specification for Fuel Oils."

2.6. Kerosene (Kerosine). – Shall meet the latest version of ASTM D3699, “Standard Specification for Kerosine.”

2.7. Denatured Fuel Ethanol. – Intended for blending with gasoline shall meet the latest version of ASTM D4806, “Standard Specification for Denatured Fuel Ethanol for Blending with Gasolines for Use as Automotive Spark-Ignition Engine Fuel.”

(Amended 2014)

2.8. Liquefied Petroleum (LP) Gases. – Shall meet the latest version ASTM D1835, “Standard Specification for Liquefied Petroleum (LP) Gases.”

NOTE: Also reference Gas Processors Association 2140, Liquefied Petroleum Gas Specification and Test Methods.

2.9. Liquefied Natural Gas (LNG) Vehicle Fuel. – Shall meet the latest version of SAE J2699, “Liquefied Natural Gas (LNG) Vehicle Fuel.”

(Added 2018)

2.~~9~~10. Compressed Natural Gas (CNG). – Shall meet the latest version of SAE J1616, “Recommended Practice for Compressed Natural Gas Vehicle Fuel.”

2.~~10~~11. Ethanol Flex Fuel. –Ethanol flex fuel is covered by one of two ASTM standards based on the ethanol concentration of blend:

(a) Ethanol flex fuel containing 51 to 83 volume percent ethanol shall meet the latest version of ASTM D5798, “Standard Specifications for Ethanol Fuel Blends for Flexible Fuel Automotive Spark-Ignition Engines**;**”~~;~~ and

(b) Ethanol flex fuel containing 16 to 50 volume percent ethanol shall be blended, stored, ~~**and conveyed**~~ **delivered and offered** for consumption in accordance with the latest version of ASTM D7794, “Standard Practice for Blending Mid-Level Ethanol Fuel Blends for Flexible Fuel Vehicles with Automotive Spark-Ignition Engines.”
(Amended 2018)

(Added 1997) (Amended 2014 **and 2018**)

2.~~11~~12. M85 Fuel Methanol. –Shall meet the latest version of ASTM D5797, “Standard Specification for Fuel Methanol M70-M85 for Automotive Spark Ignition Engines.”
(Added 1997)

2.13. Racing Gasoline. – Shall meet the following requirements:

(a) The Minimum Antiknock Index (AKI) shall not be less than the AKI posted on the product dispenser or as certified on the invoice, bill of lading, shipping paper, or other documentation.

(b) The product specifications limits shall be those as declared by the manufacturer’s product specifications. Upon the request of the Director, each supplier of racing gasoline shall provide a copy of the manufacturer’s product specifications.

(Added 2018)

2.~~12~~14. Engine (Motor) Oil. – Shall not be sold or distributed for use unless the product conforms to the following specifications:

(a) performance claims listed on the label shall be evaluated against the latest version of SAE J183, “Engine Oil Performance and Engine Service Classification,” API 1509 “Engine Oil Licensing and Certification System,” European Automobile Manufacturers’ Association (ACEA), “European Oil Sequences,” or other “Vehicle or Engine Manufacturer Standards” as applicable; and

(b) the product shall meet its labeled viscosity grade specification as specified in the latest version of SAE J300, "Engine Oil Viscosity Classification."

(Added 2004) (Amended 2014)

2.~~13~~15. Products for Use in Lubricating Manual Transmissions, Gears, or Axles. –Shall not be sold or distributed for use in lubricating manual transmissions, gears, or axles unless the product conforms to the following specifications:

(a) it is labeled with one or more of the service designations found in the latest version of the SAE Information Report on axle and manual transmission lubricants, SAE J308, and API Publication 1560, and meets all applicable requirements of those designations;

(b) the product shall meet its labeled viscosity grade classification as specified in the latest version of SAE J306; and

(c) the product shall be free from water and suspended matter when tested by means of centrifuge, in accordance with the latest version of ASTM D2273, "Standard Test Method for Trace Sediment in Lubricating Oils."

(Added 2004)

2.~~14~~16. Products for Use in Lubricating Transmissions. –Transmission fluids shall meet the original equipment manufacturer's requirements for those transmissions or have demonstrated performance claims to be suitable for use in those transmissions. Where a fluid can be licensed against an original equipment manufacturer's specification, evidence of current licensing by the marketer is acceptable documentation of performance against the specification. In the absence of a license from the original equipment manufacturer, adherence to the original equipment manufacturer's recommended requirements shall be assessed after testing per relevant methods available to the lubricants industry and the state regulatory agency. Suitability for use claims shall be based upon appropriate field, bench, and/or transmission rig testing. Any manufacturer of a transmission fluid making suitable-for-use claims shall provide, upon request by a duly authorized representative of the Director, credible documentation of such claims. If the product performance claims published by a blender and/or marketer are based on the claim(s) of one or more additive suppliers, documentation of the claims may be requested in confidence by a duly authorized representative of the Director. Supporting data may be supplied directly to the Director's office by the additive supplier(s).

(Added 2004) (Amended 2017)

2.146.1. Conformance. – Conformance of a fluid per Section 2.14. Products for Use in Lubricating Transmissions does not absolve the obligations of a fluid licensee with respect to the licensing original equipment manufacturer or the original equipment manufacturer's licensing agent(s), where relevant.

(Added 2017)

2.146.2. Transmission Fluid Additives. – Any material offered for sale or sold as an additive to transmission fluids shall be compatible with the transmission fluid to which it is added, and shall meet all performance claims as stated on the label or published on any website referenced by the label. Any manufacturer of any such product sold in this state shall provide, upon request by a duly authorized representative of the Director, documentation of any claims made on their product label or published on any website referenced by the label.

(Added 2017)

2.~~15~~17. Biodiesel Blendstock. – **~~B100 b~~B**iodiesel intended for blending with diesel fuel shall meet the latest version of ASTM D6751, "Standard Specification for Biodiesel Fuel **~~(B100)~~** Blend Stock **(B100)** for **Middle** Distillate Fuels." **All biodiesel blend stock shall be at least 99 % biodiesel (no more than 1 % diesel fuel). Any blend stock less than 99% biodiesel shall not be used as a commercial blend stock for biodiesel blends without the permission of the Director.**

(Added 2004) **(Amended 2018)**

~~2.16. Biodiesel Blends. – Blends of biodiesel and diesel fuels shall meet the following requirements:~~

~~**(a) blends that contain less than or equal to 5 % must meet the latest version of ASTM D975, "Standard Specification for Diesel Fuel Oils";**~~

~~**(b) blends greater than 5 % biodiesel and that contain less than or equal to 20 % by volume shall meet the latest version of ASTM D7467, "Standard Specification for Diesel Fuel Oil, Biodiesel Blend (B6 to B20)";**~~

~~**(c) use of S15 biodiesel is required when blending into S15 low sulfur motor vehicle diesel fuel when the intention is to certify the fuel as S15 grade; and**~~

~~**(d) when blends greater than 20 % are offered for sale, the diesel fuel used in the blend shall meet the latest version of ASTM D975, "Standard Specification for Diesel Fuel Oils," and the biodiesel blend stock shall meet the specifications of Section 2.15. Biodiesel.**~~

~~**(Added 2004) (Amended 2008)**~~

2.18. Butanol for Blending with Gasoline. – Shall meet the latest version of ASTM D7862, "Standard Specifications for Butanol for Blending with Gasoline for Use as Automotive Spark-Ignition Engine Fuel."

(Added 2018)

2.19. Dimethyl Ether for Fuel Purposes. – Shall meet the latest version of ASTM D7901, "Standard Specification for Dimethyl Ether for Fuel Purposes."

(Added 2018)

2.~~17~~20. Hydrogen Fuel. –Shall meet the latest version of SAE J2719, "Hydrogen Fuel Quality for Fuel Cell Vehicles."

(Added 2012)

2.~~18~~21. Diesel Exhaust Fluid (DEF). –Shall meet the latest version of the ISO 22241, "Diesel engines – NOx reduction agent AUS 32."

(Added 2014)

Section 3. Classification and Method of Sale ~~of Petroleum Products~~

3.1. General Considerations.

3.1.1. Documentation. –When products regulated by this rule are sold, an invoice, bill of lading, shipping paper, or other documentation must accompany each delivery other than a retail sale. This document must identify the quantity, the name of the product, the particular grade of the product, the applicable automotive fuel rating, and oxygenate type and content (if applicable), the name and address of the seller and buyer, and the date and time of the sale. Documentation must be retained at the retail establishment for a period not less than one year.

(Amended 2008)

3.1.2. Retail Dispenser Labeling. –All retail dispensing devices must identify conspicuously the type of product **(exception: gasoline and gasoline-oxygenate blends)**, the particular grade of the product **(exception: No. 2 Diesel)**~~,~~ and the applicable automotive fuel rating.

(Amended 2018)

3.1.3. Grade Name. –The sale of any product under any grade name that indicates to the purchaser that it is of a certain automotive fuel rating or ASTM grade shall not be permitted unless the automotive fuel rating or grade indicated in the grade name is consistent with the value and meets the requirements of Section 2, Standard ~~**Fuel**~~ Specifications.

(Amended 2018)

3.1.4. Nozzle Requirements for Automotive Gasoline, Gasoline-Oxygenate Blends, and Diesel Fuel Dispensers. – Each retail dispensing device from which fuel products are sold shall be equipped with a nozzle spout having a diameter that conforms with the latest version of SAE J285, "Dispenser Nozzle Spouts for Liquid Fuel Intended for Use with Spark-Ignition and Compression Ignition Engines."

(Added 2018)

3.2. Automotive Gasoline and Automotive Gasoline-Oxygenate Blends (Including Racing Gasoline).

3.2.1. Posting of Antiknock Index Required. – ~~All a~~Automotive gasoline and automotive gasoline-oxygenate blends shall post the **minimum** antiknock index in accordance with applicable regulations, 16 CFR 306 issued pursuant to the Petroleum Marketing Practices Act, as amended.

(Amended 2018)

~~**3.2.2. When the Term "Leaded" May be Used. – The term "leaded" shall be used only when the fuel meets specification requirements of paragraph 2.1.5. Minimum Lead Content to be Termed "Leaded."**~~

3.2.~~3~~2. Use of Lead Substitute Must be Disclosed. –Each dispensing device from which gasoline or gasoline-oxygenate blends containing a lead substitute is dispensed shall display the following legend: "Contains Lead Substitute." The lettering of this legend shall not be less than 12.7 mm (½ in) in height and the color of the lettering shall be in definite contrast to the background color to which it is applied.

~~**3.2.4. Nozzle Requirements for Leaded Fuel. – Each dispensing device from which gasoline or gasoline-oxygenate blends that contain lead in amounts sufficient to be considered "leaded" gasoline, or lead substitute engine fuel, is sold shall be equipped with a nozzle spout having a terminal end with an outside diameter of not less than 23.63 mm (0.930 in).**~~

3.2.~~5~~3. Prohibition of Terms. – It is prohibited to use specific terms to describe a grade of gasoline or gasoline-oxygenate blend unless it meets the minimum antiknock index requirement shown in Table 1. Minimum Antiknock Index Requirements.

Table 1.
Minimum Antiknock Index Requirements

Term	**Minimum Antiknock Index**	
	ASTM D4814 Altitude Reduction Areas IV and V	**All Other ASTM D4814 Areas**
Premium, Super, Supreme, High Test	90	91
Midgrade, Plus	87	89
~~**Regular Leaded**~~	~~**86**~~	~~**88**~~
Regular, Unleaded (alone)	85	87
Economy	--	86

(Table 1. Amended 1997 **and 2018**)

3.2.~~6~~4. Method of Retail Sale. – Type of Oxygenate must be disclosed. All automotive gasoline or automotive gasoline-oxygenate blends**, or racing gasoline** kept, offered, or exposed for sale, or sold at retail containing ~~**at least 1.5 mass percent oxygen**~~ **more than 1 volume percent oxygenate** shall be identified as "with" or "containing" (or similar wording) the predominant oxygenate in the engine fuel. For example, the label may read "contains ethanol" or "with methyl *tertiary*-butyl ether (MTBE)." The oxygenate contributing the largest mass percent oxygen to the blend shall be considered the predominant oxygenate. Where mixtures of only ethers are present, the retailer may post the predominant oxygenate followed by the phrase "or other ethers" or alternatively post the phrase "contains MTBE or other ethers." In addition, gasoline-methanol blend**s** ~~**fuels**~~ containing more than ~~**0.15 mass percent oxygen from**~~ **0.3% by volume** methanol shall be identified as "with" or "containing" methanol. This information shall be posted on the upper 50 % of the dispenser front panel in a position clear and conspicuous from the driver's position in a type at least 12.7 mm (½ in) in height, 1.5 mm (1/16 in) stroke (width of type).

(Amended 1996 **and 2018**)

3.2.~~7~~5. Documentation for Dispenser Labeling Purposes. – **For automotive gasoline, automotive gasoline-oxygenate blends, or racing gasoline, t**~~T~~he retailer shall be provided, at the time of delivery of the fuel, on product transfer documents such as an invoice, bill of lading, shipping paper, or other documentation:

~~(a)~~ Information that ~~**compiles**~~ **complies** with 40 CFR § 80.1503 when the fuel contains ethanol.

(Added 2014)

(b) For fuels that do not contain ethanol, information that complies with 40 CFR § 80.1503 and a declaration of the predominant oxygenate or combination of oxygenates present in concentrations sufficient to yield an oxygen content of at least 1.5 mass percent in the fuel. Where mixtures of only ethers are present, the fuel supplier may identify either the predominant oxygenate in the fuel (i.e., the oxygenate contributing the largest mass percent oxygen) or alternatively, use the phrase "contains MTBE or other ethers."

(Added 2014)

~~(c)~~ Gasoline containing more than ~~**0.15 mass**~~ **0.3** percent ~~**oxygen from**~~ **by volume** methanol shall be identified as "with" or "containing" methanol.

(Added 2014) **(Amended 2018)**

(Amended 1996**,** ~~and~~ 2014**, and 2018**)

3.2.~~8~~6. EPA Labeling Requirements also Apply. –Retailers and wholesale purchaser-consumers of gasoline shall comply with the EPA pump labeling requirements for gasoline containing greater than 10 volume percent (v%) up to 15 volume percent (v%) ethanol (E15) under 40 CFR 80.1501.

(Added 2012)

3.3. Diesel Fuel.

3.3.1. Labeling of Grade Required. – Diesel Fuel **other than No.2-D** shall be identified by grades ~~**No. 1-D, No. 2-D, or No. 4-D**~~.

(Amended 2018)

~~**3.3.2. EPA Labeling Requirements Also Apply. – Retailers and wholesale purchaser-consumers of diesel fuel shall comply with EPA pump labeling requirements for sulfur under 40 CFR § 80.570.**~~

3.3.2. Automotive Fuel Rating. –Diesel fuel containing 6 % to 20 % biodiesel shall be labeled with its automotive fuel rating in accordance with the Federal Trade Commission Automotive Fuel Ratings, Certification and Posting Rule, 16 CFR 306.

(Amended 2018)

3.3.3. Delivery Documentation for Premium Diesel. –Before or at the time of delivery of premium diesel fuel, the retailer or the wholesale purchaser-consumer shall be provided on an invoice, bill of lading, shipping paper, or other documentation a declaration of all performance properties that qualifies the fuel as premium diesel fuel as required in Section 2.2.1. Premium Diesel Fuel.

(Added 1998)(Amended 1999)

~~**3.3.4. Nozzle Requirements for Diesel Fuel. – Each dispensing device from which diesel fuel is sold at retail shall be equipped with a nozzle spout with a diameter that conforms to the latest version of SAE J285,**~~

~~**"Dispenser Nozzle Spouts for Liquid Fuels Intended for Use with Spark Ignition and Compression Ignition Engines." (Enforceable effective July 1, 2013)**~~

~~**(Added 2012)**~~

(Amended 1998, 1999, 2008, ~~**and**~~ 2012**, and 2018**)

3.4. Aviation Turbine Fuels.

3.4.1. Labeling of Grade Required. – Aviation turbine fuels shall be identified by ~~**Jet A, Jet A-1, or Jet B**~~ **the grade terms contained in applicable ASTM Standard Specifications. See EI 1542 for additional detail**.

(Amended 2018)

3.4.2. NFPA Labeling Requirements also Apply. – Each dispenser or airport fuel truck dispensing aviation turbine fuels shall be labeled in accordance with the most recent edition of National Fire Protection Association (NFPA 407), Standard for Aircraft Fuel Servicing.

*__NOTE:__ For example, NFPA 407, 20~~07~~**17** edition: Section ~~**4.3.18 Product Identification Signs.**~~**6.1.11.3 Signage.** Each aircraft fuel servicing vehicle **or cart** shall have a sign**age viewable from all** ~~**on each**~~ side**s of the vehicle** ~~**and the rear to indicate the product**~~. ~~**The s**~~**S**ign**s** shall have letters at least 75 mm (3 in) high**. Signs shall be** of **a** color ~~**sharply**~~ contrasting **sharply** with ~~**it's**~~ **the** background for visibility. ~~**It shall show t**~~**T**he word**s** "FLAMMABLE**,**" **"NO SMOKING,"** and the name of the product carried, such as ~~"~~JET A,~~"~~ ~~"~~JET B,~~"~~ ~~"~~GASOLINE,~~"~~ or ~~"~~AVGAS~~."~~, **shall appear on each sign.** (__NOTE:__ Refer to the most recent edition NFPA 407.)*

(Amended 2018)

3.5. Aviation Gasoline.

3.5.1. Labeling of Grade Required. – Aviation gasoline shall be identified by ~~**Grade 80, Grade 91, Grade 100, or Grade 100LL, or Grade 82UL**~~ **the grade terms contained in applicable ASTM Standard Specifications. See EI 1542 for additional detail.**

(Amended 2008 **and 2018**)

3.5.2. NFPA Labeling Requirements also Apply. –Each dispenser or airport fuel truck dispensing aviation gasoline shall be labeled in accordance with the most recent edition of National Fire Protection Association (NFPA) 407, Standard for Aircraft Fuel Servicing.

*__NOTE:__ For example, NFPA 407, 20~~07~~**17** edition: Section ~~**4.3.18 Product Identification Signs.**~~**6.1.11.3 Signage.** Each aircraft fuel servicing vehicle **or cart** shall have a sign**age viewable from all** ~~**on each**~~ side**s of the vehicle** ~~**and the rear to indicate the product**~~. ~~**The s**~~**S**ign**s** shall have letters at least 75 mm (3 in) high**. Signs shall be** of **a** color ~~**sharply**~~ contrasting **sharply** with ~~**it's**~~ **the** background for visibility. ~~**It shall show t**~~**T**he word**s** "FLAMMABLE**,**" **"NO SMOKING,"** and the name of the product carried, such as ~~"~~JET A,~~"~~ ~~"~~JET B,~~"~~ ~~"~~GASOLINE,~~"~~ or ~~"~~AVGAS~~."~~, **shall appear on each sign.** (__NOTE:__ Refer to the most recent edition NFPA 407.)*

(Amended 2018)

3.6. Fuel Oils.

3.6.1. Labeling of Grade Required. –Fuel Oil shall be identified by the grades ~~**of No. 1 S500, No. 1 S5000, No. 2 S500, No. 2 S5000, No. 4 (Light), No. 4, No. 5 (Light), No. 5 (Heavy), or No. 6.**~~ **contained in the latest version of ASTM D396.**

(Amended 2018)

3.6.2. Retail Fuel Oil. – Dispensers shall display the following legend:

"Warning – Not Suitable for Use In Unvented Heaters Requiring No. 1-K Kerosene."

The lettering of this legend shall not be less than 12.7 millimeters (1/2 in) in height by 1.5 millimeters (1/16 in) strokes (width of type); block style letters and the color of lettering shall be in definite contrast to the background color to which it is applied.

(Added 2018)

(Amended 2008 **and 2018**)

3.7. Kerosene (Kerosine).

3.7.1. Labeling of Grade Required. – Kerosene shall be identified by the grades No. 1-K or No. 2-K.

3.7.2. Additional Labeling Requirements. – Each retail dispenser of kerosene shall be labeled as 1-K Kerosene or 2-K. In addition, No. 2-K dispensers shall display the following legend:

"Warning - Not Suitable for Use In Unvented Heaters Requiring No. 1-K."

The lettering of this legend shall not be less than 12.7 mm (½ in) in height by 1.5 mm (1/16 in) stroke; block style letters and the color of lettering shall be in definite contrast to the background color to which it is applied.

3.8. Ethanol Flex Fuel.

3.8.1. How to Identify Ethanol Flex Fuel. – Ethanol flex fuel shall be identified as Ethanol Flex Fuel or EXX Flex Fuel.

3.8.2. Labeling Requirements.

(a) Ethanol flex fuel with an ethanol concentration no less than 51 and no greater than 83 volume percent shall be labeled "Ethanol Flex Fuel, minimum 51 % ethanol."

(b) Ethanol flex fuel with an ethanol concentration less than or equal to 50 volume percent shall be labeled "EXX Flex Fuel, minimum YY % ethanol," where the XX is the ethanol concentration in volume percent and YY is XX minus five (− 5). The actual ethanol concentration of the fuel shall be XX volume percent plus or minus five (± 5) volume percent.

(Added 2014)

(c) A label shall be posted which states "For Use in Flexible Fuel Vehicles (FFV) Only." This information shall be clearly and conspicuously posted on the upper 50 % of the dispenser front panel in a type at least 12.7 mm (½ in) in height, 1.5 mm (1/16 in) stroke (width of type). A label shall be posted which states, "CHECK OWNER'S MANUAL," and shall not be less than 6 mm (¼ in) in height by 0.8 mm (1/32 in) stroke; block style letters and the color shall be in definite contrast to the background color to which it is applied.

(Amended 2007, 2008, and 2014)

3.9. M85 Fuel Methanol.

3.9.1. How to Identify M85 Fuel Methanol. – Fuel methanol shall be identified as M85.

Example:
M85

3.9.2. Retail Dispenser Labeling.

(a) Fuel methanol shall be labeled with its automotive fuel rating in accordance with 16 CFR 306.

Example:
M85 Methanol

(b) A label shall be posted which states "For Use in Vehicles Capable of Using M85 Only." This information shall be clearly and conspicuously posted on the upper 50 % of the dispenser front panel in a type of at least 12.7 mm (½ in) in height, 1.5 mm (1/16 in) stroke (width of type).

(Amended 2008)

3.10. Liquefied Petroleum Gas (LPG).

3.10.1. How LPG is to be Identified. –Liquefied petroleum gases shall be identified by grades Commercial Propane, Commercial Butane, Commercial PB Mixtures or Special-Duty Propane (HD5).

3.10.2. Retail Dispenser Labeling. – Each retail dispenser of LPGs shall be labeled as "Commercial Propane," "Commercial Butane," "Commercial PB Mixtures," or "Special-Duty Propane (HD5)."

3.10.3. Additional Labeling Requirements. – LPG shall be labeled with its automotive fuel rating in accordance with 16 CFR 306.

3.10.4. NFPA Labeling Requirements Also Apply. (Refer to the most recent edition of NFPA 58.)

3.11. Compressed Natural Gas (CNG).

3.11.1. How Compressed Natural Gas is to be Identified. – For the purposes of this regulation, compressed natural gas shall be identified by the term "Compressed Natural Gas" or "CNG."

3.11.2. Retail Sales of Compressed Natural Gas Sold as a Vehicle Fuel.

3.11.2.1. Retail Dispenser Labeling.

3.11.2.1.1. Identification of Product. –Each retail dispenser of CNG shall be labeled as "Compressed Natural Gas."

3.11.2.1.2. Non-Liquid Alternative Vehicle Fuel Rating. – CNG shall be labeled with its non-liquid alternative vehicle fuel rating in accordance with 16 CFR 309.
(Added 2018)

~~**3.11.2.1.2. Pressure. – CNG is dispensed into vehicle fuel containers with working pressures of 20 684 kPa (3000 psi), or 24 821 kPa (3600 psi). The dispenser shall be labeled 20 684 kPa (3000 psi), or 24 821 kPa (3600 psi) corresponding to the pressure of the CNG dispensed by each fueling hose.**~~
~~**(Amended 2016)**~~

3.11.2.1.3. NFPA Labeling. – NFPA Labeling requirements also apply. (Refer to NFPA 52.)

3.11.~~3~~2.2. Nozzle Requirements for CNG. – CNG fueling nozzles shall comply with ANSI/AGA/CGA NGV 1.

3.12. Liquefied Natural Gas (LNG).

3.12.1. How Liquefied Natural Gas is to be Identified. –For the purposes of this regulation, liquefied natural gas shall be identified by the term "Liquefied Natural Gas" or "LNG."

3.12.2. Labeling of Retail Dispensers of Liquefied Natural Gas Sold as a Vehicle Fuel.

3.12.2.1. Identification of Product. –Each retail dispenser of LNG shall be labeled as "Liquefied Natural Gas."

3.12.2.2. Automotive Fuel Rating. – LNG automotive fuel shall be labeled with its automotive fuel rating in accordance with 16 CFR 306.

3.12.2.3. NFPA Labeling. – NFPA Labeling requirements also apply. (Refer to NFPA 57.)

3.13. Oil.

3.13.1. Labeling of Vehicle Engine (Motor) Oil Required.

3.13.1.1. Viscosity. –The label on any vehicle engine (motor) oil container, receptacle, dispenser, or storage tank and the invoice or receipt from service on an engine that includes the installation of bulk vehicle engine (motor) oil dispensed from a receptacle, dispenser, or storage tank shall contain the viscosity grade classification preceded by the letters "SAE" in accordance with the SAE International's latest version of SAE J300, "Engine Oil Viscosity Classification."

(Amended 2012 and 2014)

3.13.1.2. Brand. –The label on any vehicle engine (motor) oil container and the invoice or receipt from service on an engine that includes the installation of bulk vehicle engine (motor) oil dispensed from a receptacle, dispenser, or storage tank shall contain the name, brand, trademark, or trade name of the vehicle engine (motor) oil.

(Added 2012 and 2014)

3.13.1.3. Engine Service Category. –The label on any vehicle engine (motor) oil container, receptacle, dispenser or storage tank and the invoice or receipt from service on an engine that includes the installation of bulk vehicle engine (motor) oil dispensed from a receptacle, dispenser, or storage tank shall contain the engine service category, or categories, displayed in letters not less than 3.18 mm ($^1/_8$ in) in height, as defined by the latest version of SAE J183, "Engine Oil Performance and Engine Service Classification (Other than "Energy Conserving")" API Publication 1509, "Engine Oil Licensing and Certification System," European Automobile Manufacturers Association (ACEA), "European Oil Sequences," or other "Vehicle or Engine Manufacturer Standards" as provided in Section 3.13.1.3.1.

(Amended 2012 and 2014)

3.13.1.3.1. Vehicle or Engine Manufacturer Standard. –The label on any vehicle engine (motor) oil container, receptacle, dispenser, or storage tank and the invoice or receipt from service on an engine that includes the installation of vehicle engine (motor) oil dispensed from a receptacle, dispenser, or storage tank shall identify the specific vehicle or engine manufacturer standard, or standards, met in letters not less than 3.18 mm ($^1/_8$ in) in height. If the vehicle (motor) oil only meets a vehicle or engine manufacturer standard, the label must clearly identify that the oil is only intended for use where specifically recommended by the vehicle or engine manufacturer.

(Added 2014)

3.13.1.3.2. Inactive or Obsolete Service Categories. –The label on any vehicle engine (motor) oil container, receptacle, dispenser, or storage tank and the invoice or receipt from service on an engine that includes the installation of vehicle engine (motor) oil dispensed from a receptacle, dispenser, or storage tank shall bear a plainly visible cautionary statement in compliance with the latest version of SAE J183, "Engine Oil Performance and Engine Service Classification (Other than "Energy Conserving")" Appendix A, whenever the vehicle engine (motor) oil in the container or in bulk does not meet an active API service category as defined by the latest version of SAE J183, "Engine Oil Performance and Engine Service Classification (Other than "Energy Conserving")." If a vehicle engine (motor) oil is identified as only meeting a vehicle or engine manufacturer standard, the labeling requirements in Section 3.13.1.3.1. Vehicle or Engine Manufacturer Standard applies.

(Added 2012) (Amended 2014)

3.13.1.4. Tank Trucks or Rail Cars. –Tank trucks, rail cars, and types of delivery trucks that are used to deliver bulk vehicle engine (motor) oil are not required to display the SAE viscosity grade and service category or categories on such tank trucks, rail cars, and other types of delivery trucks.

(Added 2012) (Amend 2013 and 2014)

3.13.1.5. Documentation. – When the engine (motor) oil is sold in bulk, an invoice, bill of lading, shipping paper, or other documentation must accompany each delivery. This document must identify the quantity of bulk engine (motor) oil delivered as defined in Sections 3.13.1.1. Viscosity; 3.13.1.2. Brand; 3.13.1.3. Engine Service Category; the name and address of the seller and buyer; and the date and time of the sale. For inactive or obsolete service categories, the documentation shall also bear a plainly visible cautionary statement as required in Section 3.13.1.3.2. Inactive or Obsolete Service Categories. Documentation must be retained at the retail establishment for a period of not less than one year.

(Added 2013) (Amended 2014)

(Amended 2012, 2013, and 2014)

3.13.2. Labeling of Recreational Motor Oil.

3.13.2.1. Viscosity. –The label on each container of recreational motor oil shall contain the viscosity grade classification preceded by the letters "SAE" in accordance with the SAE International's latest version of SAE J300, "Engine Oil Viscosity Classification."

3.13.2.2. Intended Use. –The label on each container of recreational motor oil shall contain a statement of its intended use in accordance with the latest version of SAE J300, "Engine Oil Viscosity Classification."

3.13.3. Labeling of Gear Oil.

3.13.3.1. Viscosity. –The label on each container of gear oil shall contain the viscosity grade classification preceded by the letters "SAE" in accordance with the SAE International's latest version of SAE J306, "Automotive Gear Lubricant Viscosity Classification" or SAE J300, "Engine Oil Viscosity Classification."

3.13.3.1.1. Exception. –Some automotive equipment manufacturers may not specify an SAE viscosity grade requirement for some applications. Gear oils intended to be used only in such applications are not required to contain an SAE viscosity grade on their labels.

3.13.3.2. Service Category. –The label on each container of gear oil shall contain the service category, or categories, in letters not less than 3.18 mm (1/8 in) in height, as defined by the latest version of SAE J308, "Axle and Manual Transmission Lubricants."

(Added 2004)

3.14. Transmission Fluid.

3.14.1. Labeling and Identification of Transmission Fluid. – Transmission fluid shall be labeled or identified as described below.

(Added 2017)

3.14.1.1. Container Labeling. – The label on a container of transmission fluid shall not contain any information that is false or misleading. Containers include bottles, cans, multi-quart or liter containers, pails, kegs, drums, and intermediate bulk containers (IBCs). In addition, each container of transmission fluid shall be labeled with the following:

(a) the brand name;

(b) the name and place of business of the manufacturer, packer, seller, or distributor;

(c) the words "Automatic Transmission Fluid," which may be incorporated into a more specific description of transmission type such as "Automatic Transmission Fluid" or "Continuously Variable Transmission Fluid";

(d) the primary performance claim or claims met by the fluid and reference to where any supplemental claims may be viewed (e.g., website reference). Performance claims include by are not limited to those set by original equipment manufacturers and standards setting organizations such as SAE and JASO and are acknowledged by reference; and

(e) an accurate statement of the quantity of the contents in terms of liquid measure.

(Amended 2017)

3.14.1.2. Identification on Documentation. – Transmission fluid sold in bulk shall be identified on the manufacturer, packer, seller or distributor invoice, bill of lading, shipping paper, or other documentation with the information listed below:

(a) the brand name;

(b) the name and place of business of the manufacturer, packer, seller, or distributor;

(c) the words "Transmission Fluid" which may be incorporated into a more specific description of transmission type such as "Automatic Transmission Fluid" or "Continuously Variable Transmission Fluid";

(d) the primary performance claim or claims met by the fluid or reference to where these claims may be viewed (e.g., website reference). Performance claims include but are not limited to those set by original equipment manufacturers and standards-setting organizations such as SAE and JASO and are acknowledged by reference; and

(e) an accurate statement of the quantity of the contents in terms of liquid measure.

(Added 2017)

3.14.1.3. Identification on Service Provider Documentation. – Transmission fluid installed from a bulk tank at time of transmission service shall be identified on the customer invoice with the information listed below:

(a) the brand name;

(b) the name and place of business of the service provider;

(c) the words "Transmission Fluid" which may be incorporated into a more specific description of transmission type such as "Automatic Transmission Fluid" or "Continuously Variable Transmission Fluid";

(d) the primary performance claim or claims met by the fluid or reference to where these claims may be viewed (e.g., website reference). Performance claims include but are not limited to those set by original equipment manufacturers and standards-setting organizations such as SAE and JASO and are acknowledged by reference; and

(e) an accurate statement of the quantity of the contents in terms of liquid measure.

(Added 2017)

3.14.1.4. Bulk Delivery. – When the transmission fluid is sold in bulk, an invoice, bill of lading, shipping paper, or other documentation must accompany each delivery. This document must identify the fluid as defined in Section 3.14.2. Container Labeling.

(Added 2017)

3.14.1.5. Storage Tank Labeling. – Each storage tank of transmission fluid shall be labeled with the following:

(a) the brand name;

(b) the primary performance claim or claims met by the fluid or reference to where these claims may be viewed (e.g., website reference). Performance claims include but are not limited to those set by original equipment manufacturers and standards-setting organizations such as SAE and JASO and are acknowledged by reference. (Added 2017)

3.14.1.6. Documentation of Claims Made Upon Product Label. –Any manufacturer, packer, or distributor of any product subject to this article and sold in this state shall provide, upon request of duly authorized representatives of the Director, credible documentation of any claim made upon their product label, including claims made on any website referenced by said label. If the product performance claims published by blender and/or marketer are based on the claim(s) of one or more additive suppliers, documentation of the claims may be requested in confidence by a duly authorized representative of the Director. Supporting data may be supplied directly to the Director's office by the additive supplier(s).

(Added 2004) (Amended 2017)

3.15. Biodiesel and Biodiesel Blends.

3.15.1. Identification of Product. – Biodiesel **Blendstock** shall be identified by the term "biodiesel" with the designation "B100**" or "B99**." ~~**Biodiesel blends shall be identified by the term "Biodiesel Blend."**~~ **(Amended 2018)**

3.15.2. Labeling of Retail Dispensers.

3.15.2.1. Labeling of Grade Required. – Biodiesel shall be identified by the grades **No. 1-B** S15**, No.1-B S500, or No.2-B** ~~or~~ S500. ~~**Biodiesel blends shall be identified by the grades No. 1-D, No. 2-D, or No. 4-D.**~~

~~**3.15.2.2. EPA Labeling Requirements also Apply. – Retailers and wholesale purchaser-consumers of biodiesel blends shall comply with EPA pump labeling requirements for sulfur under 40 CFR 80.570.**~~

3.15.2.~~3~~2. Automotive Fuel Rating. –Biodiesel and biodiesel blends shall be labeled with its automotive fuel rating in accordance with **the Federal Trade Commission Automotive Fuel Ratings, Certification and Posting Rule,** 16 CFR 306.

3.15.2.~~4~~3. Biodiesel Blends. – When biodiesel blends greater than 20 % by volume are offered by sale, each side of the dispenser where fuel can be delivered shall have a label conspicuously placed that states "Consult Vehicle Manufacturer Fuel Recommendations."

The lettering of this legend shall not be less than 6 mm (¼ in) in height by 0.8 mm (1/32 in) stroke; block style letters and the color shall be in definite contrast to the background color to which it is applied.

3.15.3. Documentation for Dispenser Labeling Purposes. – The retailer shall be provided, at the time of delivery of the fuel, a declaration of the volume percent biodiesel on an invoice, bill of lading, shipping paper, or other document. This documentation is for dispenser labeling purposes only; it is the responsibility of any potential blender to determine the amount of biodiesel in the diesel fuel prior to blending.

3.15.4. Exemption. – Biodiesel blends that contain less than or equal to 5 % biodiesel by volume are exempted from the requirements of Sections 3.15.1. Identification of Product, 3.15.2. Labeling of Retail Dispensers, and 3.15.3. Documentation for Dispenser Labeling Purposes when it is sold as "diesel fuel" as required in Section 3.3. Diesel Fuel.

(Added 2005) (Amended 2008 **and 2018**)

3.16. Diesel Exhaust Fluid (DEF).

3.16.1. Labeling of Diesel Exhaust Fluid (DEF). – DEF shall be labeled.

3.16.1.1. Retail Dispenser Labeling. –A label shall be clearly and conspicuously placed on the front panel of the DEF dispenser stating "for operation of selective catalytic reduction (SCR) converters in motor vehicles with diesel engines."

3.16.1.2. Documentation for Retailers of Bulk Product. –A DEF supplier shall provide, at the time of delivery of the bulk shipment of DEF, identification of the fluid's origin including the name of the fluid manufacturer, the brand name, trade name, or trademark, and a statement identifying the fluid as DEF conforming to specifications given in the latest version of ISO 22241, "Diesel engines – NOx reduction agent AUS 32." This information shall be provided by the supplier on an invoice, bill of lading, shipping paper, or other document.

3.16.1.3. Labeling Packaged Product. –Any DEF retail package shall bear a label that includes the name of the fluid manufacturer, the brand name, trade name, or trademark, a statement identifying the fluid as DEF conforming to specifications given in the latest version of ISO 22241, "Diesel engines – NOx reduction agent AUX 32." And the statement, "It is recommended to store DEF between − 5 °C to 30 °C (23 °F to 86 °F)."

3.16.1.4. Documentation for Bulk Deliveries. –A carrier that transports or accepts for transportation any bulk shipment by tank truck, freight container, cargo tank, railcar, or any other vehicle used to transport or deliver bulk quantities of DEF shall, at the time of delivery of the DEF, provide identification of the fluid's origin including the name of the fluid manufacturer, the brand name, trade name, or trademark, and a statement identifying the fluid as DEF conforming to specifications given in the latest version of ISO 22241, "Diesel engines – NOx reduction agent AUS 32." This information shall be provided to the recipient on an invoice, bill of lading, shipping paper, or other document.

Effective date shall be January 1, 2016.

(Added 2014)

Section 4. Retail Storage Tanks and Dispenser Filters

4.1. Water in Gasoline-Alcohol Blends, Biodiesel Blends, Ethanol Flex Fuel, Aviation Gasoline, and Aviation Turbine Fuel. –No water phase greater than 6 mm (¼ in) as determined by an appropriate detection paste or other acceptable means, is allowed to accumulate in any tank utilized in the storage of gasoline-alcohol blend, biodiesel, biodiesel blends, ethanol flex fuel, aviation gasoline, and aviation turbine fuel.

(Amended 2008, 2012, and 2014)

4.2. Water in Gasoline, Diesel, Gasoline-Ether, and Other Fuels. –Water shall not exceed 25 mm (1 in) in depth when measured with water indicating paste or other acceptable means in any tank utilized in the storage of diesel, gasoline, gasoline-ether blends, and kerosene sold at retail except as required in Section 4.1. Water in Gasoline-Alcohol Blends, Biodiesel Blends, Ethanol Flex Fuel, Aviation Gasoline, and Aviation Turbine Fuel.

(Amended 2008, 2012, and 2014)

4.3. Dispenser Filters.

4.3.1. Engine Fuel Dispensers.

(a) All gasoline, gasoline-alcohol blends, gasoline-ether blends, ethanol flex fuel, and M85 methanol dispensers shall have a 10 micron or smaller nominal pore-sized filter.

(b) All biodiesel, biodiesel blends, diesel, and kerosene dispensers shall have a 30 micron or smaller nominal pore-sized filter.

(Amended 2014)

4.3.2. Delivery of Aviation Fuel and Gasoline.

(a) Fuel delivery of aviation turbine fuel into aircraft shall be filtered through a fuel filter/separator conforming to ~~API~~ **EI** 1581, "Specification and Qualification Procedures for Aviation Jet Fuel Filter/Separators."

(b) Fuel delivery of aviation gasoline into aircraft shall be filtered through a fuel filter/separator conforming to ~~API~~ **EI** 1581, "Specification and Qualification Procedures for Aviation Jet Fuel Filter/Separators."

(Added 2008) (Amended 2014 **and 2018**)

4.4. Product Storage Identification.

4.4.1. Fill Connection Labeling. – The fill connection for any fuel product storage tank or vessel supplying engine-fuel devices shall be permanently, plainly, and visibly marked as to the product contained.

(Amended 2008)

4.4.2. Declaration of Meaning of Color Code. – When the fill connection device is marked by means of a color code, the color code shall be conspicuously displayed at the place of business~~.~~ **and the API color codes as specified and published in "API Recommended Practice 1637" shall be used.**

(Amended 2018)

4.5. Volume of Product Information. – Each retail location shall maintain on file a calibration chart or other means of determining the volume of each regulated product in each storage tank and the total capacity of such storage tank(s). This information shall be supplied immediately to the Director.

Section 5. Condemned Product

5.1. Stop-Sale Order at Retail. –A stop-sale order may be issued to retail establishment dealers for fuels failing to meet specifications or when a condition exists that causes product degradation. A release from a stop-sale order will be awarded only after final disposition has been agreed upon by the Director. Confirmation of disposition shall be submitted in writing on form(s) provided by the Director and contain an explanation for the fuel's failure to meet specifications. Upon discovery of fuels failing to meet specifications, meter readings and physical inventory shall be taken and reported in confirmation for disposition. Specific variations or exemptions may be made for fuels designed for special equipment or services and for which it can be demonstrated that the distribution will be restricted to those uses.

5.2. Stop-Sale Order at Terminal or Bulk Plant Facility. – A stop-sale order may be issued when products maintained at terminals or bulk plant facilities fail to meet specifications or when a condition exists that may cause product degradation. The terminal or bulk storage plant shall immediately notify all customers that received those product(s) and make any arrangements necessary to replace or adjust to specifications those product(s). A release from a stop-sale order will be awarded only after final disposition has been agreed upon by the Director. Confirmation of disposition of products shall be made available in writing to the Director. Specific variations or exemptions may be made for fuels used for blending purposes or designed for special equipment or services and for which it can be demonstrated that the distribution will be restricted to those uses.

Section 6. Product Registration

6.1. Engine Fuels Designed for Special Use. –All engine fuels designed for special use that do not meet ASTM specifications or standards addressed in Section 2. Standard Fuel Specifications shall be registered with the Director on forms prescribed by the Director 30 days prior to when the registrant wishes to engage in sales. The registration form shall include all of the following information:

6.1.1. Identity. – Business name and address(es).

6.1.2. Address. – Mailing address, if different than business address.

6.1.3. Business Type. – Type of ownership of the distributor or retail dealer, such as an individual, partnership, association, trust, corporation, or any other legal entity or combination thereof.

6.1.4. Signature. – An authorized signature, title, and date for each registration.

6.1.5. Product Description. – Product brand name and product description.

6.1.6. Product Specification. – A product specification sheet shall be attached.

6.2. Renewal. – Registration is subject to annual renewal.

6.3. Re-registration. – Re-registration is required 30 days prior to any changes in Section 6.1. Engine Fuels Designed for Special Use.

6.4. Authority to Deny Registration. – The Director may decline to register any product that actually or by implication would deceive or tend to deceive a purchaser as to the identity or the quality of the engine fuel.

6.5. Transferability. – The registration is not transferable.

Section 7. Test Methods and Reproducibility Limits

7.1. ASTM Standard Test Methods. – ASTM Standard Test Methods referenced for use within the applicable Standard Specification shall be used to determine the specification values for enforcement purposes.

7.1.1. Premium Diesel. –The following test methods shall be used to determine compliance with the premium diesel parameters:

(a) **Cetane Number.** – ASTM D613, "Standard Test Method for Cetane Number of Diesel Fuel Oil";

(b) **Low Temperature Operability.** – ASTM D4539, "Standard Test Method for Filterability of Diesel Fuels by Low-Temperature Flow Test (LTFT) or ASTM D2500, "Standard Test Method for Cloud Point of Petroleum Products" (according to marketing claim);

(c) **Thermal Stability.** – ASTM D6468, "Standard Test Method for High Temperature Stability of Middle Distillate Fuels" (180 min, 150 °C); and

(d) **Lubricity.** – ASTM D6079, "Standard Test Method for Evaluating Lubricity of Diesel Fuels by the High Frequency Reciprocating Rig (HFRR)."

(Amended 2003)

7.2. Reproducibility Limits.

7.2.1. AKI Limits. – When determining the antiknock index acceptance or rejection of a gasoline sample, the AKI reproducibility limits as outlined in the latest version of ASTM D4814, "Standard Specification for Automotive Spark-Ignition Engine Fuel, Appendix X1 shall be acknowledged for enforcement purposes.

7.2.2. Reproducibility. – The reproducibility limits of the standard test method used for each test performed shall be acknowledged for enforcement purposes, except as indicated in Section 2.2.1. Premium Diesel Fuel and Section 7.2.1. AKI Limits. No allowance shall be made for the precision of the test methods for aviation gasoline or aviation turbine fuels.

(Amended 2008)

7.2.3. SAE Viscosity Grades for Engine Oils. – All values are critical specifications as defined in the latest version of ASTM D3244, "Standard Practice for Utilization of Test Data to Determine Conformance with Specifications." The product shall be considered to be in conformance if the Assigned Test Value (ATV) is within the specification.

(Added 2008)

7.2.4. Dispute Resolution. – In the event of a dispute over a reported test value, the guidelines presented in the latest version of ASTM D3244, "Standard Practice for Utilization of Test Data to Determine Conformance with Specifications," shall be used to determine the acceptance or rejection of the sample.

7.2.5. Additional Enforcement Action. – The Director may initiate enforcement action in the event that, based upon a statistically significant number of samples, the average test result for products sampled from **~~a particular person~~** **the same source location** is greater than the legal maximum or less than the legal minimum limits (specification value), posted values, certified values, or registered values.

(Added 2008) **(Amended 2018)**

Background/Discussion:
The NCWM Fuels and Lubricants Subcommittee formed a focus group in May 2015 to review Chapter G, Uniform Engine Fuels and Automotive Lubricants Regulation, of NIST Handbook 130 for areas and inconsistencies requiring updates. This item aims to align Chapter G with current Federal laws and regulations (except for those being reviewed under separate item numbers), ASTM, and other consensus-based standards, as well as remove obsolete provisions of Federal regulations, making any technical changes that are needed to improve the timeliness and relevance of the document.

This item has the consensus of the Fuels and Lubricants Subcommittee; all comments have been adjudicated and participants have agreed to move forward with a much-improved document, requesting L&R to consider this as a voting item in 2018.

At the 2018 NCWM Interim Meeting, many comments were received supporting this item as voting status. One regulator commented that he has disagreement on the meaning of the API color code system for tanks and believes this is overregulation. He believes there should be caution taken to move the forward as a voting item. Jim Rocco, PMAA, stated that he is not opposed to the item but has concerns about ethanol labeling. The L&R Committee believes this item is fully developed and recommends this item as Voting status.

At the 2018 NCWM Annual Meeting, the NIST Technical Advisor remarked that striking the term "Engine" will impact the Title of NIST Handbook 130. The Committee heard many comments of support from regulators, industry and manufacturers. There was a change to Section 3.3.2. Automotive Fuel Rating, to add the words "by volume." During the Voting session, this item was removed from the consent calendar. A representative (Kansas) remarked an additional editorial change is required for Section 2.17 to say "% by volume." The Committee concurred with this change and a vote was taken.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to **www.ncwm.net/meetings/annual/publication-16** to review these documents.

POL – NCWM POLICY, INTERPRETATIONS AND GUIDELINES

POL-1 D Section 2.6.17. Methods of Sale for Packages of Consumer Commodities – Federal Trade Commission and Acceptable Common or Usual Declarations for Packages of Food – Food and Drug Administration.

Source:
NIST OWM (2018)

Purpose:
Provide NIST Handbook 130 users with easy access to tables to identify the method of sales prescribed by the Federal Trade Commission (FTC) for products subject to that agency's regulation and the acceptable common or usual declarations permitted to appear on packages of food by the Food and Drug Administration (FDA).

Item under Consideration:

Amend NIST Handbook 130, NCWM Policy, Interpretations and Guidelines as follows:

NOTE: NIST/OWM is also requesting editorial privileges to add items as they receive confirmation from FDA as to what the acceptable common or usual declaration for a product is. NIST/OWM will then automatically update the handbook (chart) and list all changes to the Amendment chart located in the front NIST Handbook 130.

2.6.XX. Methods of Sale for Packages of Consumer Commodities – Federal Trade Commission (FTC) and Acceptable Common or Usual Declarations for Packages of Food – Food and Drug Administration (FDA).

The purpose of a method of sale requirement is to provide a uniform measurement unit for the sale of a commodity or product so that consumers can compare quantities and prices so that they can make informed purchasing decisions and value comparisons. Traditional methods of sale are established based on long-term usage of certain measurement units that are prevalent among an industry or trade group which have gained widespread acceptance and use by both sellers and consumers. The decision to adopt a traditional method of sale is based on the unit of measurement being traceable to national standards.

The following table is based in part on the 1978 Guide 7699.2 in the Food and Drug Administrations (FDA) "Fair Packaging and Labeling Manual" and other publications and guidance received from FDA in response to inquiries. The information the table is based on FDA's interpretation of Section 101.7 "Declaration of Net Quantity of Contents" in 21 CFR 101 – Food Labeling, Subpart A:

21 CFR 101.7 Declaration of net quantity of contents.

(a) The principal display panel of a food in package form shall bear a declaration of the net quantity of contents. This shall be expressed in the terms of weight, measure, numerical count, or a combination of numerical count and weight or measure.

The statement shall be in terms of fluid measure if the food is liquid, or

in terms of weight if the food is solid, semisolid, or viscous, (See Note 1) or a mixture of solid and liquid;

Except that such statement may be in terms of dry measure if the food is a fresh fruit, fresh vegetable, or other dry commodity that is customarily sold by dry measure.

If there is a firmly established general consumer usage and trade custom of declaring the contents of a liquid by weight, or a solid, semisolid, or viscous product by fluid measure, it may be used.

Whenever the Commissioner determines that an existing practice of declaring net quantity of contents by weight, measure, numerical count, or a combination in the case of a specific packaged food does not facilitate value comparisons by consumers and offers opportunity for consumer confusion, he will by regulation designate the appropriate term or terms to be used for such commodity.

…

(c) When the declaration of quantity of contents by numerical count does not give adequate information as to the quantity of food in the package, it shall be combined with such statement of weight, measure, or size of the individual units of the foods as will provide such information.

Note 1. **FDA has not defined a "viscous" liquid but a general definition is that it is typically a liquid that has a thick (for example, some syrups have between 66 % to 74 % solids) or sticky consistency and which flows slowly when poured. Another identifying characteristic is that significant variations between two or more density measurements are frequently, but not always found in tests of viscous liquids.**

A product that is "concentrated or "semi-concentrated" (for example, "concentrated soup" typically has a high solids content and the instructions indicate that it is to be mixed with water or milk to "reconstitute" it) is typically treated as a "semi-solid" food.

Note 2. **When a note refers to "MOS" it means the Uniform Method of Sale of Commodities Regulation in Section IV of this handbook.**

Note 3. **When a note refers to "CPG" it means an FDA Compliance Policy Guideline (See www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/default.htm)**

Note 4. **When a note refers to "I &G" it means Section VI. NCWM Policy, Interpretations and Guidelines of this handbook.**

Note 5. **When a note refers to NBS HB 108 it means NBS Handbook 108 "Weights and Measures Labeling Handbook" (1971). This handbook was developed following the adoption of the Federal Fair Packaging and Labeling Act (FPLA) as an aid to facilitating agreement and uniformity between federal and state labeling regulations. Some of the information in handbook is obsolete because it was based on the original FPLA which was adopted in 1966. It has not been revised to reflect the 1992 amendments to FPLA is out-of-print. However, it but contains useful labeling information and many early precedent setting interpretations from both the Food and Drug Administration and the Federal Trade Commission. A PDF copy is available from the NIST Office of Weights and Measures.**

Note 6. **The United States Department of Agriculture (USDA) Food Safety and Inspection Service (FSIS) has primary jurisdictional authority over meat and poultry labeling but some food products containing certain percentages of meat and poultry fall under FDA jurisdiction. For example, spaghetti sauces with less than 2 percent cooked meat, pork and beans, bagel dogs and gravy mixes are exempt from FSIS regulations but are under FDA jurisdiction (this is called an "amenability" determination). (See USDA publication "A Guide to Federal Food Labeling Requirements for Meat, Poultry and Egg Products 2007 at www.fsis.usda.gov/wps/wcm/connect/f4af7c74-2b9f-4484-bb16-fd8f9820012d/Labeling_Requirements_Guide.pdf?MOD=AJPERES)**

Table A. Acceptable Common or Usual Net Quantity of Contents Declarations on Packages of Food

Product	**Acceptable Common or Usual Declaration**	**Notes**
Abalone, Canned in Brine	**Net Weight**	**§101.7 (a) a mixture of solid food and liquid must be sold by weight. See also Footnote 2. This food sold by net**

		weight, because the brine was edible per FDA 7622 (Page I-52) in NBS HB 108.
Apples, Fresh	Dry Measure or Net Weight In addition, may also show min. size, range in size, and/or count	§101.7 (a) a solid food must be sold by weight or by dry measure per trade custom. See also I & G Section 2.3.2 "Fresh Fruits and Vegetables."
Anchovies (in salt)	Weight of Fish	§101.7 (a) a solid food must be sold by weight.
Apricots, canned	Net Weight	§101.7 (a) a mixture of solid food and liquid must be sold by weight.
Artichokes, canned	Drained Weight	Must be sold by drained weight per FDA 7563 (Page I-20) in NBS Handbook 108. See also Footnotes 2 and 3.
Asparagus, fresh	Net Weight	§101.7 (a) a mixture of solid food and liquid must be sold by weight.
Beans, fresh	Dry Measure or Net Weight	§101.7 (a) a solid food must be sold by weight or by dry measure per trade custom. See also I & G Section 2.3.2 "Fresh Fruits and Vegetables."
Berries, small open containers	No marking, Dry Measure on cellophane covered	See MOS § 1.1.2. Methods of Sale where sales by net weight are also permitted. See also Footnote 1 and I & G Section 2.3.2 "Fresh Fruits and Vegetables."
Biscuits	Net Weight and Count	§101.7 (a) a solid food must be sold by weight.
Bloaters, smoked (a Bloater is a whole, ungutted, cold-smoked herring.)	Net Weight of Fish	§ 101.7(a) a solid food must be sold by weight.
Bread	Net Weight	See also MOS § 1.2. Methods of Sale where sale by net weight is required.
Broth, Beef and Chicken	Net Weight	Beef and chicken broth labeling is regulated by the USDA and these products are included here for information. See Footnote 4 for method of sale information which is based on trade custom.
Cabbage, fresh	Dry Measure or Net Weight	§101.7 (a) a solid food must be sold by weight or by dry measure per trade custom. See also I & G Section 2.3.2 "Fresh Fruits and Vegetables."
~~Cake (decorations)~~	~~No markings~~	
Cantaloupes, fresh	Count	§101.7 (a) a solid food must be sold by weight, count or by dry measure per

		trade custom. See also I & G Section 2.3.2 "Fresh Fruits and Vegetables."
Catsup (ketchup or catchup)	Net Weight	§101.7(a) a viscous liquid must be sold by weight.
Celery, fresh	Count	§101.7 (a) a solid food must be sold by weight, count or by dry measure per trade custom. See also I & G Section 2.3.2 "Fresh Fruits and Vegetables."
Cereals	Net Weight	§101.7 (a) a solid food must be sold by weight.
Cheese (general)	Net Weight	§101.7 (a) a solid food must be sold by weight.
Cheese (limburger)	Net Weight	§101.7 (a) a solid food must be sold by weight.
Cherries, canned	Net Weight	§101.7 (a) a mixture of solid food and liquid must be sold by weight.
Cherries, maraschino	Net Weight or Dry Measure, No. of rows and minimum size	§101.7 (a) a solid food must be sold by weight or by dry measure per trade custom. See also I & G Section 2.3.2 "Fresh Fruits and Vegetables."
Chicken, canned	Net Weight	Most chicken is regulated by the USDA and this product is included in this list for information only. See 9 CFR § 381.121(c)(5) which requires solid foods or mixtures of solids and liquids to be sold by net weight.
Citrus fruit (fresh)	Dry Measure	§101.7 (a) a solid food must be sold by weight or by dry measure per trade custom. See also I & G Section 2.3.2 "Fresh Fruits and Vegetables."
Chow-Chow This is relish (typically made from chopped and chunks of green tomatoes (and sometimes red tomatoes), cabbage, mustard seed or powder, onions, hot peppers, sweet peppers, and vinegar.)	Net Weight	§101.7 (a) a mixture of solid food and liquid must be sold by weight.
Citrus juices	Fluid Measure	§101.7 (a) if a food is liquid it must be sold by fluid measure.
Clams, canned	Drained Weight	Sale by drained weight, required because liquid is typically discarded, per FDA 7563 and 7622 (Pages I-20 & I-52) in NBS Handbook 108. See also Footnotes 2 and 3.

Cookies (cakes)	Net Weight and Count	§101.7 (a) a solid food may be sold by weight or count and, because cookies vary in size and weight, count alone is not sufficient.
Corn on Cob (canned)	Count	See CPG Sec. 585.325 Corn on the Cob, Canned - Quantity of Contents Declaration. To satisfy the requirement of 21 CFR 101.105(a), the quantity of contents declaration on canned corn on the cob should be in terms of count (number of ears). FDA permits a declaration in terms of net weight to appear, but it is not required.
Cottonseed meal	Net Weight	§101.7 (a) a solid food must be sold by weight.
Crabmeat, canned (dry)	Net Weight	§101.7 (a) a solid food must be sold by weight.
Crabmeat in brine	Drained Weight	See Footnote 2.
Crackers	Net Weight	§101.7 (a) a solid food must be sold by weight.
Cranberries	Dry Measure (e.g., cranberry barrel) also Net Weight	§101.7 (a) a solid food must be sold by weight or by dry measure per trade custom. See also I & G Section 2.3.2 "Fresh Fruits and Vegetables."
Dates	Net Weight	§101.7 (a) a solid food must be sold by weight.
Doughnuts (Donuts)	Net Weight and Count	§101.7 (a) a solid food may be sold by weight or count and, because doughnuts vary in size and weight, count alone is not sufficient per FDA 7605 (Page I-42) in NBS HB 108.
Fish, canned	Net Weight	§101.7 (a) a solid food must be sold by weight.
Fish, fresh	No marking, Net Weight	§101.7 (a) a solid food must be sold by weight.
Fish, frozen	Net Weight, No marking	§101.7 (a) a solid food must be sold by weight.
Fish, salted or smoked	Net Weight and Count	§101.7 (a) a solid food must be sold by weight.
Fruits, canned	Net Weight	§101.7 (a) a mixture of solid food and liquid must be sold by weight.
Fruits, fresh	Dry Measure or Net Weight, also min size and/or count	§101.7 (a) a solid food must be sold by weight or by dry measure per trade custom. See also I & G Section 2.3.2 "Fresh Fruits and Vegetables."

Fruit juices	**Fluid Volume**	**§ 101.7 (a) a liquid food must be sold by fluid measure.**
Grains, sacked	**Net Weight**	**§101.7 (a) a solid food must be sold by weight.**
Grapefruit, fresh	**Dry Measure, Size & Count, also Net Weight**	**§101.7 (a) a solid food must be sold by weight or by dry measure per trade custom. See also I & G Section 2.3.2 "Fresh Fruits and Vegetables."**
Grapes, fresh	**Net Weight & Dry Measure**	**§101.7 (a) a solid food must be sold by weight or by dry measure per trade custom. See also I & G Section 2.3.2 "Fresh Fruits and Vegetables."**
Greens, fresh	**Dry Measure & Net Weight, also No marking**	**§101.7 (a) a solid food must be sold by weight or by dry measure per trade custom. See also I & G Section 2.3.2 "Fresh Fruits and Vegetables."**
Gum	**Number of Sticks**	**Selling gum by number of sticks is a traditional method of declaring quantity per FDA 7613 (Page I-45) in NBS HB 108.**
Herring Roe	**Net Weight**	**§101.7 (a) a solid food must be sold by weight.**
Herring, spiced	**Drained Weight Herring, Total Weight Contents**	**See Footnotes 2 and 3.**
Honey, comb	**Net Weight**	**§101.7 (a) a solid food must be sold by weight.**
Honey, strained	**Net Weight**	**§101.7 (a) a viscous liquid must be sold by weight.**
Jelly	**Net Weight**	**§101.7 (a) a solid food must be sold by weight.**
Lemons, fresh	**Count & Average Diameter, also Dry Measure**	**§101.7 (a) a solid food must be sold by weight or by dry measure per trade custom. See also I & G Section 2.3.2 "Fresh Fruits and Vegetables."**
Lettuce	**Dozen Count & Dry Measure**	**See also I & G Section 2.3.2 "Fresh Fruits and Vegetables."**
Lobster, canned (dry)	**Net Weight**	**§101.7 (a) a solid food must be sold by weight.**
Lobster meat in brine (cooked)	**Drained Weight**	**Sales by drained weight, required because brine was discarded, per FDA 7563 and 7622 (Pages I-20 & I-52) in NBS Handbook 108. See also Footnotes 2 and 3.**
Margarine	**Net Weight**	**§101.7 (a) a solid food must be sold by weight. See also 21 U.S.C. Food, Drug**

		and Cosmetic Act, §347 Intrastate Sales of Colored Oleomargarine.
Mayonnaise	Fluid Volume	See 21 CFR §169.140 Mayonnaise - defined is a semisolid food which must be sold by weight but, it is trade custom to sell this food by fluid volume.
Meats	Net Weight	Most meat is regulated by USDA and is provided here for information. See 9 CFR § 317.2 (h) which requires solid foods to be sold by net weight.
Microgreens	Net Weight	FDA Response Received: November 4, 2014 - FDA confirmed that a solid food product should be sold by weight. This was in response to an OWM inquiry via email.
Milk, sweetened, condensed	Net Weight	§101.7 (a) a solid food must be sold by weight.
Milk, evaporated	Fluid Volume (Net Weight, may be declared on side panel (s))	§101.7 (a) a liquid must be sold by fluid volume.
Molasses	Net Weight and/or Fluid Volume	§101.7 (a) a viscous liquid must be sold by weight but it is trade custom to sell molasses by fluid volume.
Mushrooms, fresh	Net Weight	§101.7 (a) a solid food must be sold by weight.
Mushrooms, canned	Drained Weight	See 21 CFR Subpart B §155.201 Canned Mushrooms. See Foot notes 2 & 3.
Mussels (canned)	Drained Weight	See also MOS Section 1.5.2.5. Canned (heat processed) Mussels, Clams, Oysters, or Other Mollusks which requires these products be sold by weight.
Mustard, Prepared	Net Weight	§101.7 (a) a viscous liquid must be sold by weight.
Oil, salad, olive	Fluid Volume	§101.7 (a) a liquid must be sold by fluid volume.
Olives, green (in brine)	Drained Weight	See Footnotes 2 and 3.
Olives, ripe	Drained Weight	See Footnotes 2 and 3.
Oranges	Dry Measure & Count, also Net Weight & Size	§101.7 (a) a solid food must be sold by weight or by dry measure per trade custom.
Oysters, fresh	Fluid Volume	See also MOS Section 1.5.2.3. Canned (heat processed) Mussels, Clams, Oysters, or Other Mollusks which allows these products to be sold by weight, drained weight or fluid volume.

Oysters, canned	~~Drained Weight~~ Net Weight	See also MOS Section 1.5.2.5. Canned (heat processed) Mussels, Clams, Oysters, or Other Mollusks which requires these products be sold by weight and includes a limit on free liquid.
Peaches, canned	Net Weight	§101.7 (a) a solid food must be sold by weight.
Peaches, fresh	Dry Measure, Min. Diameter, also Net Weight & Count	§101.7 (a) a solid food must be sold by weight or by dry measure per custom.
Peanut, butter	Net Weight	§101.7 (a) a solid food must be sold by weight.
Pears, canned	Net Weight	§101.7 (a) a solid food must be sold by weight.
Peas, canned	Net Weight	§101.7 (a) a solid food must be sold by weight.
Pickles	Fluid Volume, (see 21 CFR §101.7 (r) which permits sales of one or two whole pickles in clear plastic bags by count.)	See also MOS Section 1.8. Pickles which permits sales of one or two whole pickles in clear plastic bags by count.
Pineapple, fresh	Count	§101.7 (a) a solid food may be sold by count. See also I & G Section 2.3.2 "Fresh Fruits and Vegetables."
Plums, prunes, fresh	Net Weight or Dry Measure, Count & Size denoted by rows in top layer	§101.7 (a) a solid food must be sold by weight or by dry measure per trade custom. See also I & G Section 2.3.2 "Fresh Fruits and Vegetables."
Potatoes, fresh	Net Weight or Dry Measure	§101.7 (a) a solid food must be sold by weight or by dry measure per trade custom. See also I & G Section 2.3.2 "Fresh Fruits and Vegetables."
Rabbits, dressed	Net Weight	§101.7 (a) a solid food must be sold by weight.
Rolls and Buns	Net Weight and Count	§101.7 (a) a solid food may be sold by weight or count but, because rolls and buns vary in size and weight, count alone is not sufficient per FDA 7605 (Page I-42) in NBS HB 108.
Relish (e.g. bell pepper relish, green pepper relish)	Net Weight	For pickle relish: see 21 CFR 101.7 (r) the declaration of net quantity of contents on pickles and pickle products, including relishes … shall be expressed in terms of the U.S. gallon of 231 cubic inches and quart, pint, and fluid ounce. subdivisions thereof.
Rock Lobster, canned (dry)	Net Weight	§101.7 (a) a solid food must be sold by weight.

Roe, herring	Net Weight	§101.7 (a) a solid food must be sold by weight.
Salad dressing	Fluid Volume	See 21 CFR 169.150 Salad Dressing - defined as a semisolid food it is trade custom to sell by fluid volume.
Salmon, canned	Net Weight	§101.7 (a) a solid food must be sold by weight.
Sardines, canned	Net Weight	§101.7 (a) a solid food must be sold by weight.
Sauces	When the sauce is a free-flowing liquid (e.g., "Hot Sauce or "Worcestershire Sauce") it must be sold by fluid volume. When the sauce is a viscous or slow flowing liquid or a mixture of solids and liquids it must be sold by net weight (e.g., "Chili Sauce," "Cocktail Sauce," "Tomato Sauce," "Spaghetti Sauce").	§101.7 (a) a liquid must be sold by fluid volume. §101.7 (a) a viscous liquid or mixture of solids and liquid must be sold by weight.
Sauerkraut, (unprocessed in glass)	Fluid Volume	§101.7 a mixture of solids and liquid it is trade custom to sell this food by fluid volume.
Shrimp, canned (wet)	Drained Weight	Sales by drained weight per FDA 7563 (Page I-20) in NBS Handbook 108. See also Footnotes 2 and 3.
Shrimp, canned (dry)	Net Weight	§101.7 (a) a solid food must be sold by weight.
Syrup	Fluid Volume or Net Weight	§101.7 (a) a viscous liquid must be sold by weight.
Soups, canned (liquid single strength)	Fluid Volume	§101.7 (a) a food that is liquid or a mixture of solids and liquid must be sold by fluid measure. NOTE: soups which contain meat and poultry are subject to the regulations of the U.S. Department of Agriculture and packages bear a seal of inspection by that agency. For method of sale labeling See 9 CFR 317.2 for meat products and Part 381.121 for poultry products
Soups, canned (condensed & semi-condensed)	Net Weight	§101.7 (a) a semi-solid food must be sold by weight.
Tea	Net Weight	§101.7 (a) a solid food must be sold by weight.

Tea bags	Net Weight & Count	§101.7 (a) a solid food must be sold by weight or count but, count alone is not sufficient for this food.
Toddler Food (e.g., ravioli and vegetables in a single tray.)	Net Weight	FDA Response Received: September 20, 2017 - A food entree for toddlers (comprised of ravioli and peas and carrots) included a drained weight declaration for the vegetables. FDA was contacted by email and responded to OWM that the quantity of the vegetables should be declared by net weight and not drained weight. See Footnote 5.
Tomatoes, canned	Net Weight	§101.7 a mixture of solids and liquids must be sold by weight.
Tomatoes, fresh	Net Weight or Dry Measure, Size denoted by Rows in top layer	§101.7 (a) a solid food must be sold by weight or by dry measure per trade custom.
Tuna fish, canned	Net Weight or, Drained Weight*	*Several packers have permission to temporarily label by drained weight. See page 35362 Federal Register / Vol. 79, No. 119 / Friday, June 20, 2014 / Notices – "FDA - Canned Tuna Deviating from Identity Standard;"
Vegetables, canned	Net Weight	§101.7 (a) a mixture of solids and liquids must be sold by weight.
Vegetables, fresh	Dry Measure or Net Weight, also Count	§101.7 (a) a solid food must be sold by weight or by dry measure per trade custom.
Water, infused (e.g., with pieces of fruit or vegetables)	Fluid Volume	FDA Response Received: May 24, 2017 - OWM received an inquiry about containers of water sold at retail with pieces of watermelon, asparagus and mint to infuse flavor. FDA was contacted by email and responded that these products should be sold by fluid measure. See Footnote 5.
Yogurt, drinkable/pourable	Fluid Volume	FDA Response Received: May 24, 2017 - OWM received an inquiry about the appropriate method of sale for containers of pourable yogurt and smoothies. FDA was contacted by email and responded that these products should be sold by fluid measure. See Footnote 5.
This compilation will be revised from time to time as may be required by changes in consumer understanding, administrative opinion, or court decisions.		

Footnotes
Footnote 1. See also Subpart G—Exemptions from Food Labeling Requirements –21 CFR 101.100 Food; exemptions from labeling. (c) An open container (a container of rigid or semi-rigid construction, which is not closed by lid, wrapper, or otherwise other than by an uncolored transparent wrapper which does not obscure the contents) of a fresh fruit or fresh vegetable, the quantity of contents of which is not more than 1 dry quart, shall be exempt from the labeling requirements of sections 403(e), (g)(2) (with respect to the name of the food specified in the definition and standard), and (i)(1) of the act; but such exemption shall be on the condition that if two or more such containers are enclosed in a crate or other shipping package, such crate or package shall bear labeling showing the number of such containers enclosed therein and the quantity of the contents of each.
Footnote 2. Drained Weight – When required. For decades, on a case-by-case basis, under both the Federal Food Drug and Cosmetic Act (FD&C) and the Fair Packaging and Labeling Act (FPLA) FDA has advised firms that the net contents declaration should include the packing medium if it is generally consumed as part of the food. Conversely, where solid foods are packed in a salt brine or other medium that is always, or almost always, discarded before serving, the agency has expected that the label would disclose the drained weight. Alternative Language from 1997 Proposed Rule on Net Contents The Food and Drug Administration requires the net quantity of contents to be declared in terms of drained weight when the reference amount in 21 CFR 101.12 is declared in terms of drained solids. See Footnote 10 in 21 CFR 101.12 "Reference Amounts Customarily Consumed Per Eating Occasion." [10]If packed or canned in liquid, the reference amount is for the drained solids, except for products in which both the solids and liquids are customarily consumed (*e.g.*, canned chopped clam in juice). History and Background: FDA's policy on when drained weight labeling is required was described in a proposed rule on page 9833 in the Federal Register / Vol. 62, No. 42 / Tuesday, March 4, 1997. The proposed net content regulation was later withdrawn but the policy on drained weight proposed for §101.200 reflected the agency's official approach in providing the food industry labeling guidance. 4. Mass or Weight of the Packing Medium "Section 101.105 (now Section 101.7) does not address when net contents declarations that are expressed in terms of mass or weight are to be declared as the mass or weight of the contents without the packing medium, which is commonly referred to as the ''drained mass or weight'' or the ''drained solids.'' The agency tentatively concludes that new § 101.200 should address this matter. For many years, FDA has advised firms that the net contents declaration should include the packing medium if it is generally consumed as part of the food. Conversely, where solid foods are packed in a salt brine or other medium that is always, or almost always, discarded before serving, the agency has expected that the label would disclose the drained weight. For example, FDA's Fair Packaging and Labeling Manual Guide 7699.2 states that the appropriate net contents declarations for canned artichokes, canned clams, canned mushrooms, green olives in brine, and canned wet-pack shrimp are in terms of drained weight. However, the agency's case-by-case approach to determining when a packing medium is always or almost always discarded before serving would be difficult to implement uniformly if many different regulatory agencies are making such assessments. The congressional mandate for national uniformity suggests that FDA should provide more specific direction in this matter. FDA notes that it has already dealt with the issue of when a food should be declared in terms of its drained weight in its regulation on serving sizes (§ 101.12). The agency's nutrition labeling requirements provide for declaration of nutrient information in terms of the serving size based on

the reference amounts customarily consumed as set forth in § 101.12, and that section specifically provides for cases where the reference amounts are in terms of drained solids. Thus, FDA no longer has to make case-by-case assessments about whether the packing medium is always or almost always discarded before serving. Instead, the agency can now refer to § 101.12 in determining whether net contents declarations must include the packing medium. Therefore, FDA is proposing to require in § 101.200(a) that, except where the reference amount customarily consumed per eating occasion is in terms of drained solids in accordance with § 101.12, a food that is packed or canned in liquid, and that is required to bear a net contents declaration in terms of weight, shall bear a declaration expressed in terms of the total net contents including the liquid." **Here is the relevant text of the proposed §101.200 that can be used in making determinizations of whether or not a product should be labeled with drained weight:** **§ 101.200 Declaration of net quantity of contents.** **"(a) The principal display panel of a food in package form shall bear a declaration of the net quantity of contents… Except as provided for in § 101.12, a food that is packed or canned in liquid, and is required to bear a contents declaration in terms of weight, shall bear a declaration expressed in terms of the total net contents including the liquids. Where the reference amount in § 101.12 is declared in terms of drained solids, the contents declaration shall be in terms of drained weight…."**
Footnote 3: Net Weight and Drained Weight Declarations May Appear on Package Labels. **This interpretation by the Food and Drug Administration (FDA) appears on page 9856 in the Federal Register / Vol. 62, No. 42 / Tuesday, March 4, 1997 / Proposed Rules.** **"FDA points out that, for many years, it has had a policy of permitting both drained weight and net weight to be stated on the principal display panel (PDP) of a food label. However, some State regulatory agencies prohibit both drained weight and net weight from appearing on the PDP of a label because they consider one of the weight declarations to be in conflict with section 4(b) of the Fair Packaging and Labeling Act (FPLA), which prohibits qualifying words or phrases from appearing with the required net contents declaration. FDA advises that it does not believe that its policy in this regard conflicts in any way with section 4(b) of the FPLA. Although neither the language of the FPLA nor the regulations established thereunder provide clear guidance, the legislative history of the FPLA does. The May 25, 1966, Senate Report No. 1186, which addressed the meaning of the prohibition of supplemental statements, states:** **"Subsection 4(b) prohibits the qualification of the separate net quantity statement by any modifying words or phrases. However, a supplemental statement of the net quantity of contents set apart from the separate net quantity of contents, required by the bill, may be modified by nondeceptive words or phrases, so long as such words or phrases do not tend to exaggerate the amount of the commodity contained in the package. For example, where a package contains a separate net quantity statement in conformity with promulgated regulations, such as ''6 oz. net weight,'' the package could also contain in a supplemental statement, apart from the required net quantity statement, the phrase ''6 oz. of fast acting X detergent'' but could not contain the statement ''6 jumbo oz. of X detergent'' at any place on the package* * *."** **From the above quote, it is obvious that the required declaration of net quantity may not contain statements designed to imply that one product is different in quantity from others declaring the same net contents. It is also obvious that Congress wanted the required declaration to be separate from supplemental statements designed to promote product sales. FDA has a regulation, § 101.105(o) (which would be redesignated as § 101.200(o)), that is intended to ensure that such separation exists by permitting supplementary net quantity statements on label panels other than the PDP. However, there is no indication in Senate Report No. 1186, or elsewhere in the legislative history of the FPLA, that congressional concern about a ''supplementary statement'' was intended to encompass other forms of nonmisleading information about the quantity of**

contents than the one required. To the contrary, the broad congressional policy declared in section 2 of the FPLA states:

‘‘Packages and labels should enable consumers to obtain accurate information as to the quantity of the contents and should facilitate value comparisons’’ (15 U.S.C. 1451). Declaration of a statement of net quantity of contents in terms of both drained weight and net weight would not be inconsistent with this policy because such declarations advise consumers of the amount of food and the accompanying packing medium, thereby assisting purchasing decisions. Although the agency does not consider it necessary to codify the present policy of permitting both drained weight and net weight to be declared on the PDP of a food label, FDA solicits comments on whether it should codify this policy into its regulations.

Footnote 4. In a June 3, 1998 letter to Campbell Soup Company from the USDA, Food Safety and Inspection Service (FSIS), Office of Policy Program Development and Evaluation the trade custom of labeling the net quantity of contents of packages of beef and chicken broth by net weight instead fluid measure was recognized. A copy of the letter is available from the NIST Office of Weights and Measures at 301-975-4004 or owm@nist.gov.

Table B. Method of Sale – Federal Trade Commission

The Net Quantity Declaration designated in this chart is that one used on the most common form of packaging for each commodity. If the product is packaged in multiple units or with other commodities, see “Multi-Unit Package,” “Variety Package,” or “Combination Package,” as appropriate. As noted below the Uniform Regulation for the Method of Sale of Commodities (UMSCR) also includes methods of sale for several products or commodities. Additional detail on labeling requirements is also contained in the Uniform Packaging and Labeling Regulation (UPLR).

Product or Commodity	**Net Quantity of Contents Declaration**
Aerosol Containers	**Net Weight (See also Section 10.3 “Aerosols and Other Pre-Pressurized Containers Dispensing Product under Pressure” in the UPLR).**
Air Freshener	
Aerosol	**Net Weight**
Liquid	**Fluid Measure**
Cake	**Net Weight**
Aluminum Foil	
Cooking & Bakeware	**Count and inside dimensions (length, width, and depth, or diameter and depth). Depth of less than 5 cm (2 in) and capacity are optional. (See also Section 10.8. Measurement of Container-Type Commodities – How Expressed in the UPLR).**
Wrap	***See Food Wraps***
Bags	
Garbage, Trash, Food Storage, Leaf, Lunch, etc.	**Count and dimensions (width and length for non-gusseted; width, depth, and length for gusseted). Capacity is optional. (See also Section 2.13. “Polyethylene” in the UMSCR).**

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Product or Commodity	Net Quantity of Contents Declaration
Vacuum Cleaner, Disposable	Count. (Make and model of vacuum for which intended and name and place of business must appear on the principal display panel.)
Bathmats, paper	Count and dimensions (length and width in millimeters or centimeters and inches).
Bathroom Tissue	Total square meters and square feet, number of rolls (if more than one), number of tissues per roll, ply, plus length and width of each tissue in centimeters and inches.
Batteries, Household	Count. (Voltage and/or size are factors of identity, *not* quantity.)
Bed Sheet, Paper	Dimensions (length and width of finished item in millimeters or centimeters and inches).
Bowls (Paper Foil, Plastic, etc.)	Count and dimensions. (Depth and diameter (outer top rim) in inches.) Depth of less than 5 cm (2 in) and capacity are optional.
Boxes, Food Storage	Count and dimensions (length, width and depth). Capacity is optional. (See also Section 10.8. Measurement of Container-Type Commodities – How Expressed in the UPLR).
Bulb, Light	Count, if more than one. Voltage, wattage, lumens, size, etc., are factors of identity, *not* quantity.
Butane Fuel	Net Weight
Calking Compounds	Fluid Measure
Candle	
Uniform Width or Diameter	Dimensions (length and diameter or width, in millimeters or centimeters and inches).
Tapered or irregularly shaped figures, numbers, etc.	Length or height in millimeters or centimeters and inches. (diameter need not be expressed – See also 16 C.F.R. § 501.7)
Chamois	
Full Skin (shape of the animal)	Total square meters and square feet
Cut Skin (Square, Rectangular, or Pocket)	Total square meters and square inches, followed in parentheses by square feet if more than one square foot.

Table B. Method of Sale – Federal Trade Commission

The Net Quantity Declaration designated in this chart is that one used on the most common form of packaging for each commodity. If the product is packaged in multiple units or with other commodities, see "Multi-Unit Package," "Variety Package," or "Combination Package," as appropriate. As noted below the Uniform Regulation for the Method of Sale of Commodities (UMSCR) also includes methods of sale for several products or commodities. Additional detail on labeling requirements is also contained in the Uniform Packaging and Labeling Regulation (UPLR).

Product or Commodity	**Net Quantity of Contents Declaration**
Charcoal Briquets	**Net Weight**
Christmas Decorations	
Balls	***See Ornaments***
Bulbs	***See Bulb, Light***
Garlands	***See Garlands***
Icicles or Tinsel	**Count, plus length of strands**
Ornaments	***See Ornaments***
Cigarette Paper	**Count**
Cleaning Compound	
Liquid	**Fluid Measure**
Powder, Cake, or Paste	**Net Weight**
Clothesline	***See Cordage***
Combination Package	**Count, weight volume, dimensions, or a combination thereof, for each commodity included. (See also Section 10.5. "Combination Packages" in the UPLR.**
Cooking and Bakeware Containers (Foil and Paper	***See Aluminum Foil***
Cordage	**Length in meters and feet (followed in parentheses by length in yards). Ply and diameter are optional. (Breaking strength and size designation are elements of identity.)**
Cups	
Drinking	**Count, plus fluid capacity (See also Section 10.8.3 Terms in the UPLR regarding the optional use of terms such as "fluid" with the capacity declaration.)**
Nut and Party	**Count, plus dimensions (top outside diameter, or length and width). Capacity is optional.**
Cooking and Baking (Foil or Paper)	**Count and inside dimensions (diameter and depth). Depth of less than 5 cm (2 in) and capacity are optional.**
Deodorizer	

Table B. Method of Sale – Federal Trade Commission

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Product or Commodity	Net Quantity of Contents Declaration
Aerosol	Net Weight
Liquid	Fluid Measure
Cake	Net Weight
Detergent	
Liquid	Fluid Measure
Powder, Cake, or Granular	Net Weight
Diapers, Disposable	Count and dimensions (length and width in millimeters or centimeters and inches). Dimensions may be omitted if diaper is in permanent pre-fold or form-fitted shape.
Distilled Water	Fluid Measure
Doilies, Paper	Count, plus dimensions (length and width, or diameter in millimeters or centimeters or inches).
Drop Cloth (Plastic)	Total square meters and square feet, plus length and width in the largest whole unit measurements.
Dyes and Tints (Household)	
Powder	Net Weight
Liquid	Fluid Measure
Emory Cloth (Paper	*See Sandpaper*
Eyeglass Tissue	Count
Facial Tissue	Count, ply, plus length and width of each tissue in millimeters or centimeters and inches.
Film	
Bulk or Movie	(See also Section 11.22. "Camera Film, Recording Tape, Audio Recording Tape and Other Image and Audio Recording Media Intended for Retail Sale and Consumer Use" in the UPLR). Number of meters or feet of usable film only.
Still	Number of exposures. Length and width of individual exposures in millimeters and inches are optional.
Filters, Coffee	Count and dimensions (length and width, or diameter).

Table B. Method of Sale – Federal Trade Commission

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Product or Commodity	Net Quantity of Contents Declaration
Fireplace Wood (See Section 2.4 in UMSCR)	
Cord Wood (Packaged)	Cubic feet and liters (See 2.4. "Fireplace and Stove Wood" in the UMSCR.)
Compressed Log	Net Weight
Flints, Lighter	Count
Food Storage	
Bags	*See Bags*
Boxes	*See Boxes, Food Storage*
Food Wrap (Plastic, Paper, Foil, etc.) (See Section 6.9. "Bi-dimensional Commodities" in the UPLR).	Total square meters and square feet, plus length and width in largest whole measurement. (See also Section 6.9. Bi-Dimensional Commodities in the UPLR.)
Fuses, Household	Count (if more than one). Amperage, type, voltage, size, etc., are factors of identity, *not* net quantity.
Garden Bags	*See Bags*
Garlands	Length in meters and feet (followed in parentheses by yards). Ply and/or width in inches are optional.
Glasses, Disposable	Count, plus fluid capacity of each glass.
Glue	
Liquid	Fluid Measure
Powdered	Net Weight
Grease, Household	*See Lubricants, Household*
Incense	Count
Laundry Supplies	
Liquid	Fluid Measure
Aerosol	Net Weight
Powder or Solid	Net Weight
Leaf Bags	*See Bags*
Light Bulbs	*See Bulbs, Light*
Lighter Fuel	

Table B. Method of Sale – Federal Trade Commission

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Product or Commodity	**Net Quantity of Contents Declaration**
Non-pressurized	**Fluid Measure**
Pressurized (e.g., Butane)	**Net Weight**
Logs, Compressed	***See Fireplace Wood***
Lubricants, Household	
Liquid (Oil)	**Fluid Measure**
Powder, Paste, Solid, Semi-Solid, etc.	**Net Weight**
Lunch Bag	***See Bags***
Matches	
Wooden (Kitchen, Fireplace, etc.)	**Count plus length if they are extra-long intended for fireplace use, etc.**
Book-Matches (By the Box)	**Count (number of books, number of matches per book, total number of matches).**
Mucilage	**Fluid Measure**
Multi-Unit Package	**Count, plus weight, measure, or volume for each unit, followed by the total weight, measure, or volume, as appropriate. (See also Section 10.4. "Multiunit Packages" in the UPLR.**
Napkins, Paper	**Count, ply, plus length and width of each napkin in inches.**
Oil, Household	***See Lubricants, Household***
Ornaments, Christmas	**Opaque package – count and dimensions. Count only, if ornaments are clearly visible to retail purchaser at time of purchase. (See 16 C.F.R. § 501.2)**
Paper: Crepe, Shelf, or Wrapping (Not Gift Wrap)	**Total square area, plus length and width in largest whole measurements.**
Paper Streamers	***See Tape***
Paste, Household	**Fluid Measure**
Patching Plaster	**Net Weight**
Pillow Case, Paper	**Dimensions (length and width of finished item in centimeters and inches only).**

Table B. Method of Sale – Federal Trade Commission	
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Product or Commodity	**Net Quantity of Contents Declaration**
Pipe Cleaners	**Count. Length for cleaners shorter or longer than the standard 152.4 mm (6 inches).**
Place Mats, Paper	**Count and dimensions (length and width in centimeters and inches only).**
Plastic Food Wrap	***See Food Wraps***
Plates, Disposable	**Count and outside dimensions (length and width or diameter, in centimeters and inches).**
Polish Cloth, Impregnated	**Dimensions (total square area plus length and width in the largest whole measurements).**
Polish	
Liquid	**Fluid Measures**
Aerosol	**Net Weight**
Powder, Granule, Cake, or paste	**Net Weight**
Propane Fuel	**Net Weight**
Rope, Household	***See Cordage***
Rubber Bands	**Net Weight**
Sandpaper (Fine, Medium, or Coarse, Grit, Etc.)	
One Grit Only (Fine, Medium or Coarse)	**Count and dimensions of each sheet (length and width in centimeters and inches).**
Assorted Grits	
a. Sheet Count for Each Type of Grit is Constant.	**Count of sheets per each type of grit, dimensions of each sheet (length and width in centimeters and inches), plus total sheet count.**
b. Total Sheet Count is Constant, but Sheet Count for Each Type of Grit Varies from Package to Package.	**Count and dimensions of each sheet (length and width in centimeters and inches). Identity must include term, "Assorted Miscellaneous Grits."**
Scouring Pads	
Steel Wool, Metal Coil, Plastic, Etc.	**Count plus dimensions (length, width and depth in centimeters and inches) for rectangular or square shaped pads.**

Table B. Method of Sale – Federal Trade Commission

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Product or Commodity	Net Quantity of Contents Declaration
Soap	
Powder, Flake, Chip, Poufs, Cake, Ball, etc.	**Net Weight**
Liquid	**Fluid Measure**
Solder	**Net Weight in only. Percentage of composition, diameter, and core size are factors of identity *not* quantity.** **For Solder containing precious metals see 16 C.F.R. § 501.8 "Solder." Solder and brazing alloys containing precious metals when packaged and labeled for retail sale are exempt from the net quantity statement requirements of part 500 of this chapter which specify that all statements of weight shall be in terms of avoirdupois pound and ounce provided the net quantity declaration is stated in terms of the troy pound and ounce and the term troy is used in each declaration.**
Solder Flux	
Liquid	**Fluid Measure**
Paste	**Net Weight**
Spackling Compound	**Net Weight**
Sponge (Cellulose, Rubber, etc.)	
Standard Shapes	**Dimensions (length, width and thickness or diameter and thickness, in centimeters and inches).**
Irregular Dimensions	**Count, followed by the phrase "Irregular dimensions."**
Steel Wool, for finishing and polishing pads	**Count. Total net weight is optional.**
Straws, Drinking	**Count and length. Inside diameter is optional.**
String	***See Cordage***
Table Cover, Paper	**Dimensions (length and width in centimeters and inches).**
Tableware (Plastic Cutlery)	**Count (also see Variety Package)**

Table B. Method of Sale – Federal Trade Commission **The Net Quantity Declaration designated in this chart is that one used on the most common form of packaging for each commodity. If the product is packaged in multiple units or with other commodities, see "Multi-Unit Package," "Variety Package," or "Combination Package," as appropriate. As noted below the Uniform Regulation for the Method of Sale of Commodities (UMSCR) also includes methods of sale for several products or commodities. Additional detail on labeling requirements is also contained in the Uniform Packaging and Labeling Regulation (UPLR).**	
Product or Commodity	**Net Quantity of Contents Declaration**
Tape	**Dimensions (width in centimeters and inches followed by length in largest whole measurement (e.g., meters and yards.)**
Tissue	***See Bathroom Tissue and Facial Tissue***
Toothpicks	**Count**
Towels, Paper	
Roll	**Total square meters and square feet, roll count (if more than one), number of towels per roll, ply, length and width of individual towels in centimeters and inches.**
Single	**Dimensions (length and width in centimeters and inches.)**
Trash Bags	***See Bags***
Twine	***See Cordage***
Vacuum Cleaner Bags	***See Bags***
Variety Package	**Weight, volume, measure and count, as appropriate, for each identical commodity, followed by total statement of quantity, as appropriate. (See also Section 10.6. "Variety Packages" in the UPLR.)**
Water, Distilled	**Fluid Measure**
Wax Paper	***See Food Wraps***
Wax	
Liquid	**Fluid Measure**
Aerosol	**Net Weight**
Paste, Cake, and Powder	**Net Weight**

(Added 20XX)

Background/Discussion:

(This item appeared on the 2017 Fall Regional reports as New-20. On the 2018 NCWM Interim Report it appeared as Item POL-1.)

This proposal is to provide NIST HB130 users with easy access to tables to identify the method of sales prescribed by the Federal Trade Commission (FTC) for products subject to that agency's regulation and the acceptable common or usual declarations permitted to appear on packages of food by the Food and Drug Administration. Much of this information has been published by FDA and FTC in out of print publications and by NBS/NIST in its training materials since the 1970s. The information is used by the Office of Weights and Measures in both training and daily to respond to inquiries from both weights and measures officials and industry about how products are to be sold and labeled. The tables have been revised to add current FTC labeling requirements which include requirements for metric units and additional common and usual declarations for commodities that FDA has issued in recent years in response to specific inquiries from OWM that submitted to FDA to assist packers and weights and measures officials. The FDA information is based on Guide 7699.2 in the Food and Drug Administrations "Fair Packaging and Labeling Manual" (June 1978) and other FDA guidance.

This information is useful to both packers and inspectors when determining how packages should be labeled and offered for sale. It has been available for many years in out of print publications and should be made widely available through this handbook.

NIST/OWM is also requesting editorial privileges to add items as they receive confirmation from FDA as to what the acceptable common or usual declaration for a product is. NIST/OWM will then automatically update the handbook (chart) and list all changes to the Amendment chart located in the front NIST Handbook 130.

At the 2018 NCWM Interim Meeting written comment was received from Ms. Ann Boeckman (Kraft Heinz) recommending this be a Developing item. Ms. Boeckman wants the listing to be reviewed to ensure it is consistent with current established practices and legal standards. In addition, she requests a review of the listing for consistency, clarity and appropriate use of factual product descriptors. Mr. Chris Guay, (Procter and Gamble) questioned why particular products were chosen in Table A and stated it would be helpful if there was and additional column in Table B, Section 2.6.17. containing notes. Mr. Kurt Floren (Los Angeles County) commented that there are products listed that conflict with HB130, Method of Sale and Labeling Requirements as well as routine practices in the marketplace. (Examples include citrus, cabbage, fresh asparagus, and berries). Berries specify no marking or dry measure while Section 1.1.2. Methods of Sale specify either weight or volume. Due to the discrepancies pointed out in the comments received, the L&R Committee recommends this be a Developing item.

At the 2018 NCWM Annual Meeting, Ms. Boeckman (Kraft Heinz) supports the work. This is based on guidance from the 1970's and it is important to have a process to maintain the information. Mr. Guay (Proctor and Gamble) supports the development of this as a reference document. Mr. Floren (Los Angeles County, CA) concurs with the develops of this item but remarked that if updating it, there should not be conflict with existing regulations. An example of this would be the proposal has berries a no marking or dry measure but the NIST Handbook 130 method of sale is weight or volume for this product.

Regional Association Comments:
At the 2017 SWMA Annual Meeting, Mr. Chris Guay (Proctor and Gamble) remarked this is a great idea but would like to add hyperlinks to direct the user to the supporting document or regulation within the table. Mr. Guay also remarked that consideration be given to locating this information on the NCWM website as a reference document. The SWMA L&R Committee understands that this is not a regulation and would be located within NIST HB130, Interpretations and Guidelines section for the inspector's use. The Committee believes that this information should be kept within NIST Handbook 130 and not as a separate document. The Committee also agrees that NIST should have editorial privileges to add items as they confirm with FDA or other applicable agencies.

At the 2017 CWMA Interim Meeting, an industry representative commented that he thought this item is a very good idea. He would like to see references and citations added to the table. The Committee requests that the submitter review the proposed table and compare it with the current table in NIST Handbook 130 to clarify the discrepancies and to ensure proper net content statements are used throughout the table. The CWMA recommended that it be a Developing item. At the 2018 CWMA Annual Meeting, Ms. Warfield (NIST/OWM) recommends that this item remain Developing or Informational. Ms. Warfield will continue to work with industry to further refine the proposal. The Committee recommends that the item remain a Developing item

At the 2017 NEWMA Annual Meeting, an industry representative commented he thought this is a good idea and believes having a reference cited for each item would further improve the table. A state regulator from Maine commented that this item is very helpful. A state regulator from Westchester County, NY, commented that he supports this item as a great starting point. A retired state regulator asked an industry representative if he would prefer citing a specific regulation. The industry representative commented that the more specific the reference can be, the more helpful the information would be. A state regulator from New York commented that the table should also include the specific method of sale, such as listed in HB130, Interpretations and Guidelines, Section 2.6.8., Commodities Under FTC Jurisdiction under the Fair Packaging and Labeling Act (FPLA) and Exclusions. NEWMA recommended this item as a Voting item with additional citing and reference considerations. At the 2018 NEWMA Annual Meeting, Ms. Warfield (NIST Technical Advisor) commented that NIST continues to work with industry to ready this item for voting status. Mr. Ross Anderson (retired regulator) asked about a "no marking" statement, to which Ms. Warfield replied that the language was from FTC regulations. Mr. Guay (Procter and Gamble), commented that this agenda item is a good way to further explain interpretations and guidelines, but needs clearer sourcing. He also indicated that perhaps NCWM should be determining methods of sale and seek reactions from industry, rather than being responsive to others developing such methods. Ms. Warfield commented that since FDA is the technical agency closest to developing and testing these products, they have the best perspective on how the items should be sold.

Consequently, NIST works closely with FDA to development of methods of sale for new and undefined products. NEWMA recommends that this remain a Developing item.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to **www.ncwm.net/meetings/annual/publication-16** to review these documents.

NET – HANDBOOK 133

NET-2 W Section 1.2.6.1. Applying Moisture Loss

(This item was Withdrawn)

Source:
Connecticut (2018)

Purpose:
To provide guidance that would enable inspectors to meet the requirement of allowing "reasonable moisture loss" while also allowing impacted commodity manufacturers to submit materials to NCWM if an additional percentage is desired.

Item under Consideration:
Amend NIST Handbook 133 as follows:

1.2.6.1. Applying a Moisture Allowance

Some packaged products may lose or gain moisture and, therefore, lose or gain weight or volume after packaging. The amount of moisture loss depends upon the nature of the product, the packaging material, the length of time it is in distribution, environmental conditions, and other factors. Moisture loss may occur even when manufacturers follow good distribution practices. Loss of weight "due to exposure" may include solvent evaporation, not just loss of water. For loss or gain of moisture, the moisture allowances may be applied before or after the package errors are determined.

To apply an allowance before determining package errors, adjust the Nominal Gross Weight (see Section 2.3.6. "Determine Nominal Gross Weight and Package Errors"), so the package errors are increased by an amount equal to the moisture allowance. This approach is used to account for moisture loss in both the average and individual package errors.

It is also permissible to apply the moisture allowances after individual package errors and average errors are determined.

Example:
A sample of a product that could be subject to moisture loss might fail because the average error is minus or the error in several of the sample packages are found to be unreasonable errors (i.e., the package error is greater than the Maximum Allowable Variation (MAV) permitted for the package's labeled quantity).

You may apply a moisture allowance after determining the package errors by adding the allowance to the Sample Error Limit (SEL) and then, comparing the average error to the SEL to determine compliance. The moisture allowance must be added to the MAV before evaluating sample errors to identify unreasonable minus errors**.**

(Amended 2010)

This handbook provides "moisture allowances" for some meat and poultry products, flour, pasta, and dry pet food. (See Chapter 2, Table 2-3. "Moisture Allowances") These allowances are based on the premise that when the average net weight of a sample is found to be less than the labeled weight, but not by an amount that exceeds the allowable limit, either the lot is declared to be within the moisture allowance or more information must be collected before deciding lot compliance or noncompliance.

In the event that a pre-existing moisture allowance, submitted and accepted by the National Conference on Weights and Measures, does not exist for such product, e.g., product packed in a permeable package that potentially would gain or lose moisture over the course of the product life, assuming a good distribution system, the manufacturer may be asked to submit such evidence of moisture loss or gain. In the event that the manufacturer does not reply or such data does not exist the inspector may use a coefficient of 1.5% as a surrogate for submitted data on moisture loss.

(Added 20XX)

Test procedures for flour, some meat, and poultry are based on the concept of a "moisture allowance" also known as a "gray area" or "no decision" area (see Section 2.3.8. "Moisture Allowances"). When the average net weight of a sample is found to be less than the labeled weight, but not more than the boundary of the "gray area," the lot is said to be in the "gray" or "no decision" area. The gray area is not a tolerance. More information must be collected before lot compliance or noncompliance can be decided. Appropriate enforcement should be taken on packages found short weight and outside of the "moisture allowance" or "gray area."

(Amended 2002)

Background/Discussion:

(This item appeared on the 2017 Fall Regional reports as New Item 19. On the 2018 NCWM Interim Report it appeared as item NET-2.)

The term, "reasonable moisture loss" is vague and without sufficient direction or definition to provide field staff with guidance on actions taken with respect to package weighing. The supreme court decision (Jones v. Rath Packing, 430 U.S. 519 - 1977) effectively required that officials must take into account "reasonable" moisture loss but this designation makes it difficult to defend such an action from claims of that said action is arbitrary and capricious. Logically this information would be accessible to the manufacturer; it's their plant and their customers in the distribution system. However, Jones v. Rath effectively put the onus on the weights and measures official who even if they had all the available information are still burdened with defending their actions. A set moisture coefficient would enable inspectors to meet the requirement while also allow impacted commodity manufacturers to submit materials to NCWM if an additional percentage is desired.

At this time owing to court cases (Jones v. Rath) reasonable allowance must be made for moisture loss. The problem has been that the provision was amorphous and vague, and the information may not be readily available. This situation has led to the current state of affairs that such actions taken in the field were subject to challenge as being arbitrary and capricious. "Reasonable" can be subjective and clear information about moisture loss can be illusive. Clear guidance needs to be established so that inspectors can be reasonably certain that actions taken, as long as they are consistent with Handbook 133, are defensible and not burdensome on the inspector or industry.

It can be argued that the average moisture loss should be 3% which if you examine the exempt items in HB 133 appears on average to be consistent with that number. However, this may allow a manufacturer to claim more than is justified based on examination of the product over time and conditions, unfairly impacting consumers, defacto allowing underfills because of the permissibility of the standard.

At the 2018 NCWM Interim Meeting, Mr. Lou Sakin (Massachusetts and NEWMA L&R Chair) commented that this item is not fully developed and due to merit of the concept, believes the item should be referred to the now defunct Moisture Loss Committee. Industry representative, Dale Nellor (North American Millers Association) indicated that there is a moisture allowance for wheat, but not other milled products. He recommended this be referred to a Committee for further work. Based on the comments received and review of regional reports, the L&R Committee believes this item is not fully developed and recommends this item be Withdrawn.

Regional Association Comments:
At the 2017 SWMA Annual Meeting, there were several comments heard that there was no supporting data attached to the proposal. The Committee believes that this item does not have merit, nor does it have enough information to proceed. The SWMA is not forwarding this item to NCWM.

At the 2017 NEWMA Interim Meeting, a regulator (Connecticut and submitter of this item) commented that it is an attempt to alleviate an arbitrary determination for weights and measures inspectors to determine acceptable moisture loss allowance. A state regulator from Hopkinton, MA is unsure that NCWM has the authority to adopt this provision (1.5% moisture loss). He believes the amount is arbitrary. The submitter recommends this item be Informational status to gather additional comments and thoughts from others. An industry representative commented that the NCWM has a moisture allowance task group that is currently dormant. A retired state regulator from New York commented that the idea of using the manufacturer's data against them is not arbitrary. A state regulator from Pennsylvania commented that they ordered a manufacturer's product off sale and required them to prove data that supports the moisture loss allowance for that product is reasonable. The NCWM Chairman stated he will contact the current chair of the moisture allowance task group. NEWMA believes this item should move forward as an Informational item that will be reviewed and further developed within the moisture loss task group.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to **www.ncwm.net/meetings/annual/publication-16** to review these documents.

NET-3 D Section 4.XX. Softwood Lumber

Source:
NIST OWM (2018)

Purpose:
Provide inspectors and industry with a HB133 uniform test method for softwood lumber.

Item under Consideration:
Amend NIST Handbook 133 as follows:

<u>4.XX. Softwood Lumber</u>

<u>4.XX.1. Test Equipment</u>

- **<u>304 mm (12 in) caliper with 0.01 mm (0.0005 in) graduations (or digital equivalent) for labeled dimensions up to 304 mm (12 in).</u>**
- **<u>Set of precision gage blocks.</u>**
- **<u>For labeled dimensions exceeding 304 mm (12 in), a steel linear measure with 1 mm ($^1/_{16}$ in or 0.062 in) graduations.</u>**

- **Calculator**
- **Dimensional Lumber Worksheet**
- **Wood moisture meter (e.g., a meter equipped with a probe with dual-probes and a hammer head handle for inserting the probes into the sample and that can have the moisture values manually or automatically corrected for different species of wood.)**
- **The latest version of U.S. Department of Commerce (DOC), Voluntary Product Standard PS 20 "American Softwood Lumber Standard."**

4.10.2. Test Procedure

This procedure may be used to verify the width, length, and thickness of regularly shaped dimensional lumber. Software lumber is generally represented by both the nominal dimension and the minimum dressed sizes. Testing is based on the minimum dressed sizes for both unseasoned (green) and dry lumber as found in the latest version of the U.S. DOC, Voluntary Product Standard PS 20 "American Lumber Softwood Standard." Lumber substitutes (i.e., composite) are not covered under PS 20 and must be labeled by actual dimensions.

NOTE: Lumber substitutes must be labeled by their actual dimensions.

1. **Follow Section 2.3.1. "Define the Inspection Lot." Use a "Category A" sampling plan in the inspection; select a random sample.**

   a. **The lot must be sorted by like items (i.e., species, grade, dry) including dimensions and mill number. Identify the nominal size of each piece (e.g., 38 mm × 89 mm [2 in × 4 in], 38 mm × 286 mm [2 in × 12 in], or 19 mm × 140 mm [1 in × 6 in]) and the minimum dressed size (from U.S. DOC, Voluntary Product Standards PS-20).**

   b. **Remove any outer pieces (top, sides) that have been exposed to the elements (e.g., weather, rain, moisture, sun) from the lot.**

2. **Set up in an area away from foot traffic or material moving equipment. Place the piece of wood to be measured on a solid flat surface.**

3. **Verify the accuracy of the calipers using the gage blocks. Use the calipers to measure thickness and width and record the actual dimensions on the "Worksheet for Softwood Lumber".**

   a. **For commodities labeled 3 m (10 ft) or less in length, take a minimum of three measurements across the thickness and three measurements across the width. Measurements should be evenly spaced at equal intervals (i.e., at locations approximately ¼, ½, and ¾ across the thickness and width). Calculate the average thickness and width measurement of each piece of wood.**

   b. **For commodities labeled greater than 3 m (10 ft) in length, take one additional measurement per every additional 1.8 m (6 ft) or portion thereof.**

   Note: Do not take measurements within 150 mm (6 in) from the ends or in areas where the lumber has a knot or damage would affect the measurement.

4. **Use a steel linear measure to determine the length of the piece of wood and record the actual length on the worksheet.**

a. **Take a minimum of three measurements across the length. Measurements should be evenly spaced at equal intervals (i.e., at locations across the length at approximate intervals of ¼, ½, and ¾ distance). Calculate the average length measurement of each piece of wood.**

Note: Do not take measurements in areas where the lumber has a knot or damage, which would affect the measurement.

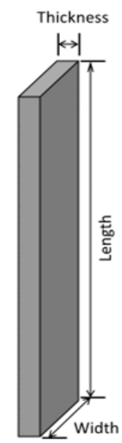

Figure 1. Example of lumber dimensions measured.

4.10.3. Shrinkage Allowance

Lumber is a product that shrinks and swells with changes in moisture content. The size of the lumber changes approximately 1 % for each 4 % change in moisture content.

4.10.3.1. Dry Lumber

The latest version of U.S. DOC, Voluntary Product Standard PS 20 defines dry lumber as being 19 % or less in moisture content.

1. **Compare the actual dimensions of thickness, width, and length of each piece to the minimum dressed sizes in NIST Handbook 130, "Uniform Regulation for the Method of Sale of Commodities" Table 1. "Softwood Lumber Sizes" and record the differences as errors on the worksheet.**

2. **Calculate the average errors for thickness, width and length. You can exceed the dressed size for the nominal value for an individual piece.**

3. **If the average error is a minus value, perform a moisture test on each piece using a wood moisture meter.**

   a. **If the moisture content of the piece is 19 %, the sample piece fails. No moisture loss allowance is provided.**

   b. **If the moisture content of the piece is between 15 % to 19 %, allow an additional 1 % for shrinkage in each dimension. (Allow 0.7 % for shrinkage for Redwood, Western Red Cedar, and Northern White Cedar).**

      If the moisture content of the piece is between 10 % to 14 %, allow an additional 2 % for shrinkage in each dimension. (Allow 1.4 % for shrinkage for Redwood, Western Red Cedar, and Northern White Cedar).

If the moisture content is less 10 %, continue to apply additional shrinkage factor as referenced above.

4.10.3.2. Unseasoned (Green) Lumber

The latest version of the U.S. DOC Voluntary Product Standard PS 20 defines unseasoned (green) lumber as being over 19 % in moisture content.

1. **Compare the actual dimensions of thickness, width, and length of each piece to the minimum dressed sizes in NIST Handbook 130, "Uniform Regulation for the Method of Sale of Commodities" Table 1. "Softwood Lumber Sizes" and record the differences as errors on the worksheet.**

2. **Calculate the average errors for thickness, width and length. You can exceed the dressed size for the nominal value for an individual piece.**

3. **If the average error is a minus value, perform a moisture test on each piece.**

   a. **If the moisture content of the piece is greater than 30 % the sample piece fails. No moisture allowance is provided.**

   b. **If the moisture content of the piece is 26 % to 30 % moisture, allow 1 % for shrinkage in each dimension.**

      Allow additional 2 % for shrinkage in each dimension for pieces with a 21 % to 25 % moisture content. (Allow 1.4 % for shrinkage for Redwood, Western Red Cedar, and Northern White Cedar).

      Continue to apply a 1 % shrinkage for every 4 % loss in moisture, continue to apply additional shrinkage factor as referenced above.

4.10.4. Evaluation of Results

1. **To determine lot conformance, return to Section 2.3.7. "Evaluate for Compliance".**

2. **If the sample pieces do not meet the average and MAV requirement based on the minimum dressed sizes after the shrinkage (moisture) allowances are considered, the lot fails. Place the Inspection Lot on hold.**

   ***Inspectors should notify the American Lumber Standard Committee (ALSC) of any lots that fail compliance. ALSC may be able to provide further evaluation.**

(Added 20XX)

American Lumber Standard Committee, Inc.
7470 New Technology Way, Suite F.
Frederick, MD 21703
301-972-1700 or 301-540-8004
E-mail: alsc@alsc.org
URL: www.alsc.org

Worksheet for Softwood Lumber

Product:		**Manufacturer/Mill Number**	
Labeled Dimensions		**Address:**	**City/State/Zip**
Length			
Width		**Brand/Grade/Surface**	**Testing Location:**
Thickness			

Piece Number	**Average Length**	**Average Width**	**Average Thickness**		**Piece Number**	**Average Length**	**Average Width**	**Average Thickness**
1.					**7.**			
Error					**Error**			
2.					**8.**			
Error					**Error**			
3.					**9.**			
Error					**Error**			
4.					**10.**			
Error					**Error**			
5.					**11.**			
Error					**Error**			
6.					**12.**			
Error					**Error**			
Total Average								
Average Error								

Table 2-8 MAV for Packages Labeled by Length, Width or Area

1 m (1 YD) or less is 3 % of labeled quantity

More than 1 m (1 YD) to 43 m (48 YD) is 1.5 % of labeled quantity

Section 1. Compliance with Maximum Allowable Variation

1. **Calculate the MAV for labeled thickness = _______. Do any of the minus errors for thickness exceed the MAV?**
   a. If yes, go to Section 5.
   b. If no, go to Section 2.

2. **Calculate the MAV for length = ________. Do any of the minus errors for width exceed the MAV?**
   a. If yes, go to Section 5.
   b. If no, go to Section 3.

3. **Calculate the MAV for labeled width = ________. Do any of the minus errors for length exceed the MAV?**
   a. If yes, go to Section 5.
   b. If no, go to Section 4.

Section 2. Compliance with the Average Requirement – Thickness

4. Calculate the Average Error for labeled thickness ________. The sample passes this requirement if the Average Error is zero or a positive number. Go to Section 3. If the Average Error is a negative number, go to Step 5.

5. Calculate the Sample Standard Deviation (*s*) and multiply (*s*) by the Sample Correction Factor (*SCF*) for the sample size to obtain the Sample Error Limit (*SEL*). Go to Step 6.

***(s)*______________ × *(SCF)*___________ = *SEL*________________**

6. Disregarding the signs, is the *SEL* in Step 5 larger than the Average Error in Step 4? If yes, the lot passes on thickness. If no, go to Section 3.

Section 3. Compliance with the Average Requirement – Length

7. Calculate the Average Error for labeled length ________. The sample passes this requirement if the Average Error is zero or a positive number. Go to Section 4. If the Average Error is a negative number, go to Step 8.

8. Calculate the Sample Standard Deviation (*s*) and multiply (*s*) by the Sample Correction Factor (*SCF*) for the sample size to obtain the Sample Error Limit (*SEL*). Go to Step 9.

***(s)*______________ × *(SCF)*___________ = *SEL*________________**

9. Disregarding the signs, is the *SEL* in Step 8 larger than the Average Error in Step 7? If yes, the lot passes on length. If no, go to Section 4.

Section 4. Compliance with the Average Requirement – Width

10. Calculate the Average Error for labeled width _______. The sample passes this requirement if the Average Error is zero or a positive number. Go to Section 6. If the Average Error is a negative number, go to 11.

11. Calculate the Sample Standard Deviation (*s*) and multiply (*s*) by the Sample Correction Factor (*SCF*) for the sample size to obtain the Sample Error Limit (*SEL*). Go to Step 12.

(*s*) ______________ × (*SCF*) ____________ = *SEL* _________________

12. Disregarding the signs, is the *SEL* in Step 11 larger than the Average Error in Step 10? If yes, approve the lot. If no, go to Section 5.

Section 5. Determine Shrink Allowance

If the average error for any dimension (thickness, length, width) is a minus value, or if the MAV is exceeded for any package, perform a moisture test on each piece to determine if a shrinkage allowance should be applied. Apply the appropriate allowance to each piece, then re-calculate the average error and re-determine compliance with the MAV.

Piece Number	**Moisture Content**	**Shrinkage Allowance**		**Piece Number**	**Moisture Content**	**Shrinkage Allowance**
1.				**7.**		
2.				**8.**		
3.				**9.**		
4.				**10.**		
5.				**11.**		
6.				**12.**		

Section 6. Action Taken: ☐ Lot Rejected ☐ Lot Approved

Comments:	**Official Name/Signature**
	Date:

Random Numbers: enter the numbers as you select them in the top row and reorder them in the bottom row.

Background/Discussion:

(This item appeared on the 2017 Fall Regional reports as Item NEW-10. On the 2018 NCWM Interim Report it appeared as NET-1.)

There is not a test procedure for softwood lumber in NIST HB133. The proposed procedure follows good measuring practices for products sold by linear measure. Over the past several years' states have requested guidance for a test procedure that determines the accuracy of softwood lumber. The test procedure was derived in part from the efforts of the California Division of Measurement Standards whose development and use over the years has shown reliable and repeatable results. This procedure was also developed with input provided from David Kretschmann, (President, American Lumber Standards Committee [ALSC] 7470 New Technology Way, Suite F, Frederick, MD 21703 PH: 301-972-1700 **www.alsc.org**) whose field representatives complete over 300 inspections a year to ensure self-compliance within their industry. ALSC field representatives validated the attached test procedure on 16 different size and types of softwood products.

At the 2018 NCWM Interim Meeting, Mr. Kretschmann commented that he used the test procedures and it works. Mr. Kretschmann also submitted a letter of support for this item. Mr. Kurt Floren (Los Angeles County) commented that NIST Handbook 133, Section 4.10.3.2. should clarify moisture content range requirements (for example, if it is 25.1 % through 25.9 %, which paragraph would apply, 4.10.3.2(3)(a) or 4.10.3.2(3)(b)). This lack of clarity also exists in in the dry lumber section. Lastly, on the worksheet the MAV Table 2.8. Maximum Allowable Variations (MAVs) for Packages Labeled by Length, Width, or Area refers to 'packaging' and should be changed to reference softwood lumber. Several regulators commented on the need and cost to purchase new equipment such as gauge blocks and calipers for following these test procedures. Mr. Kretschmann commented that they are not concerned with gauge blocks or calipers, the moisture meter is most important. Due to the uncertainty of the applied tolerance due to moisture content, the L&R Committee recommends this item as Developing.

At the 2018 NCWM National Meeting, Mr. Kretschmann was supportive of the shrinkage changes that have been addressed since the NCWM Interim Meeting. The Committee received modified language from NIST OWM and will move this language forward.

Regional Association Comments:
At the 2017 WWMA Annual Meeting, the Committee recommends this item as a Voting item.

At the 2017 SWMA Annual Meeting, Ms. Lisa Warfield (NIST Technical Advisor) remarked that this new procedure provides inspectors with a HB133 test procedure for softwood lumber. This proposal has been vetted and developed with the American Lumber Standards Committee. The SWMA is recommending this as a Voting item at the NCWM.

At the 2018 CWMA Annual Meeting, Ms. Warfield (NIST Technical Advisor) commented that the proposal submitted to the Committee was a new test procedure that was developed by California and the American Lumber Standards. NIST could not attend the January 2018 Interim meeting, and because of confusion and lack of clarity, the Committee de-escalated the item to Developing status. Ms. Warfield believes that this item is fully developed but placing it into Developing status, would preclude industry from commenting. She requests that industry be allowed to comment on this developing item at the NCWM Annual Meeting.

At the 2017 NEWMA Interim Meeting, a state regulator remarked that most jurisdictions will not have nor will it be necessary to have either a Vernier caliper or gage blocks for assessment of compliance with this commodity. A state regulator from New York commented that a steel tape would be a more appropriate standard for conducting inspections with this commodity. A retired state regulator from New York agrees. NEWMA believes this should move forward as an Informational item with a review of the inspection procedure. At the 2018 NEWMA Annual Meeting Ms. Warfield commented that she has received concerns from industry regarding this item. The NIST staff was on furlough during the 2018 NCWM Interim meeting, and questions from the Committee led to a Development status on this item. Ms. Warfield requests that the Committee consider reclassifying the item as Informational status, so industry will be able to provide comment on this item at the NCWM 2018 Annual Meeting. Mr. Mike Sikula (New York) commented that he has concern that the precision of the instrument being suggested in the test method is out of alignment with the tolerances that are needed. NEWMA recommends that the NCWM L&R Committee allow comments to be taken on this Developmental item at the 2018 NCWM Annual Meeting.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to **www.ncwm.net/meetings/annual/publication-16** to review these documents.

NET-4 D Section 4.XX. Plywood and Wood-Based Structural Panels

Source:
NIST OWM (2018)

Purpose:
Provide inspectors and industry with a HB133 uniform test method for Plywood and Wood-Based Structural Panels.

Item under Consideration:
Amend NIST Handbook 133 as follows:

4.XX. Plywood and Wood-Based Structural Panels

4.XX.1. Test Equipment

- **Steel linear measure**
  - **For labeled dimensions exceeding 304 mm (12 in), use a measure with 0.05 mm ($^{1}/_{32}$ in or 0.031 in) graduations.**
- **Calculator**
- **Worksheet for Plywood Sheet and Wood-Based Structural Panels**
- **Micrometer, caliper, or dial gauge 25 mm - 50 mm (1 in - 2 in) with 19.1 mm ($^{3}/_{4}$ in) anvils**
  - **A mechanism that applies constant pressure between 34 kPa (5 psi) and 69 kPa (10 psi) during the measurement**
- **For "tongue and groove" (e.g., floor panels) and "ship lap" (e.g., exterior siding panels) a micrometer with a 152 mm (6 in) throat; 19.1 mm ($^{3}/_{4}$ in) anvils may be necessary.**
  - **A mechanism that applies constant pressure between 34 kPa (5 psi) and 69 kPa (10 psi) during the measurement.**
- **Gage blocks.**
- **The latest version of Voluntary Product Standard PS 1-09 "Structural Plywood"**
- **The latest version of Voluntary Product Standard PS 2-10 "Performance Standard for Wood-Based—Structural-Use-Panels."**

4.XX.2. Test Procedure

This procedure may be used to verify the length, width, and thickness of plywood and wood-based structural panels.

a. Plywood sheets

- **Shall be labeled in accordance with Voluntary Product Standard PS 1-09 "Structural Plywood",**
  - **Includes grade, Performance Category (abbreviations PERF CAT, CAT or Category are permitted), thickness and the mill number.**

- **Panel sizes are typically 1.2 m (4 ft) × 2.4 m (8 ft), or 2.7 m (9 ft) or 3 m (10 ft) on a nominal basis.**
- **Panel length and width information will be included on the panel manufacturer bundle tag.**
- **Panels shall comply with the thickness tolerances for the Performance Category in Table 10. Plywood Thickness Requirements in Voluntary Product Standard PS 1-09.**
- **Panels shall bear the stamp of a qualified inspection and testing agency in accordance with Voluntary Product Standard PS 1-09, Section 7.1 Certification.**

b. Structural Panels

- **Structural panels include oriented strand board (OSB) and structural plywood.**
- **Shall be labeled according to Voluntary Product Standard (PS) 2-10 "Performance Standard for Wood-Based Structural Use Panels" For grade, span rating, Performance Category (abbreviations PERF CAT, CAT or Category are permitted), thickness and the mill number.**
- **Performance Category, such as 23/32 PERF CAT, means that the sheet shall comply with the thickness tolerances for 23/32 PERF CAT in Voluntary Product Standard (PS) 2-10, Table 1 "Panel Thickness Requirements."**

Notes:

1) **When plywood sheets or structural panels are tested in retail stores, it is recommended that they be sorted by mill and then panel type (grade, thickness).**
2) **If lots are mixed be sure to record the codes for all sheets in the sample so that the inspector and other interested parties can follow up on the information.**
3) **Record or attach a photograph of the information located on the grade stamp including the manufacturer, grade, standard (i.e., PS 1), mill number and agency.**

Moisture Content: Testing moisture content is not required but noting the conditions and signs of weather exposure is noteworthy. Moisture meters, if utilized are used in the field for rough estimates only (± 5%) due to the properties of wood and adhesives which can influence the electrical properties used in the meters.

Test Procedure:

Follow Section 2.3.1. "Define the Inspection Lot." Use a "Category A" sampling plan in the inspection; select a random sample.

b. Identify the Performance Category and actual size of each piece (e.g., 1.2 m × 2.4 m (4 ft × 8 ft), from the NIST Voluntary Product Standards PS1-09 or PS2-10. "

c. Conduct a visual inspection of each panel to ensure that there are no signs of water or other damage. Remove any outer pieces (top, sides) that have been exposed to the elements (e.g., weather, rain, moisture, sun) from the lot.

a) **Set up in an area away from foot traffic or material moving equipment. Place the piece of wood to be measured on a solid flat surface.**

Note: Overlapping (i.e., shipped siding) or interlocking panels (i.e., tongue and groove floor panels) shall be measured according to the exposed face. Measurements are taken on the surface that will be exposed after installation and does not include the overlap tab.

b) Determining Length:

For sheet length's up to 3 m (10 ft), take at least 2 measurements along the sheet length about one-quarter of the way from the center line to each edge of the sheet (see drawing). Average the results to obtain the Average Length (AL).

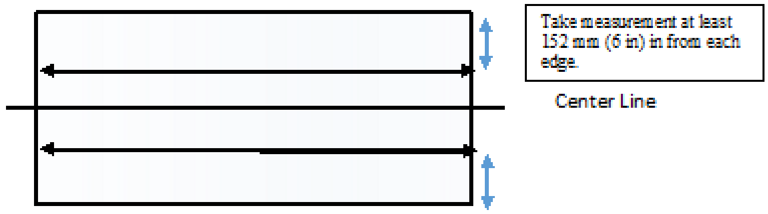

FIGURE 4. Determining Length

Note: Measurements should not be made across the ends of the board or where it has a knot or surface defect that may affect the measurement. Measurements should not be taken within 150 mm (6 in) from the edges of the sheet.

c) Determining Width:

For sheet lengths, up to 3 m (10 ft), take at least two measurements across the sheets width about ¼ of the distance from each end of the sheet (see drawing). Average the results to obtain the Average Width (AW).

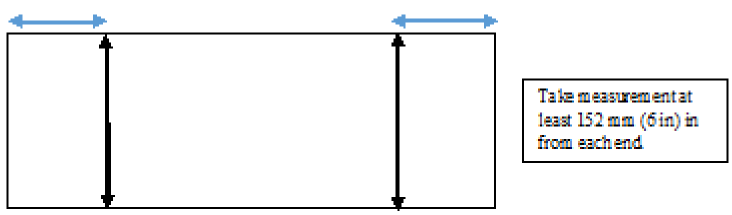

FIGURE 5. Determining Width

Note: Measurements should not be made anywhere across the sheet where it has a knot or surface defect that may affect the measurement. Measurements should not be taken within 150 mm (6 in) from the ends of the sheet.

d) Determining THICKNESS:

- **Verify the accuracy of the micrometer, caliper or dial gauge using the gauge blocks. Use the micrometer, caliper, or dial gauge 25mm-50mm (1 in – 2 in); 19.1 mm (3/4 in) anvils to measure thickness and record the actual dimensions on the "Worksheet for Plywood Sheets".**

- **For "tongue and groove" (e.g., floor panels) and "ship lap" (e.g., exterior siding panels) a micrometer with a 152 mm (6 in) throat; 19.1 mm (3/4 in) anvils may be necessary.**

The location of the measurements shall be representative of general panel thickness at approximate mid-length along each edge of the panel. The average of at least 10 equidistant measurements shall be taken to determine the thickness of the panel. Take five thickness measurements at least 25 mm (1 in) from each

edge along the length of the panel on each side. Avoid measuring at grooved locations on panel siding or at locations where there are splits, knotholes or other locations of permitted grade characteristics.

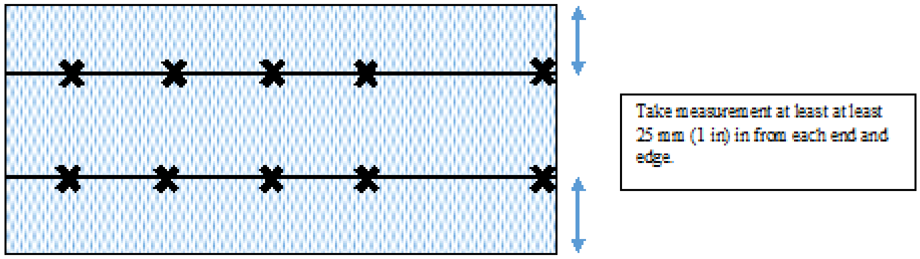

FIGURE 6. Determining Thickness.

NOTE: If a measurement point contains a knot or surface defect that may affect the measurement, then the measurement point shall be shifted from that point.

4.XX.4. Evaluation of Results

3. **To determine lot conformance, return to Section 2.3.7. "Evaluate for Compliance".**

4. **Compliance with the Average Requirement and with the MAV in Table 2-8 "MAVs for Packages Labeled by Length, Width, or Area", is based on the average of multiple measurements on each sheet in the sample.**

   - **Length – 2 measurements**
   - **Width – 2 measurements**
   - **Thickness – 10 measurements**

5. **If the sample from the lot fails the Average Requirement, a statistical test is applied to a negative average error prior to determining if the sample passes or fails.**

***It is recommended that the inspector notify APA – The Engineered Wood Association, if any lots that fail compliance. APA may be able to provide further evaluation.**

(Added 20XX)

APA
7011 S. 19th Street, Tacoma, WA 98466
Main Phone: (253) 620-6600
URL: www.apawood.org

Worksheet for Plywood Sheets and Wood-Based Structural Panels

Product:		**Mill Number and Agency:**	
Labeled Dimensions:		**Address:**	**City/State/Zip**
Length			
Width		**Brand/Grade/Surface**	**Testing Location:**
Thickness			

	Length	**Width**	**Thickness**			**Length**	**Width**	**Thickness**	
Piece #1					**Piece #2**				
Average					**Average**				
Error					**Error**				
Piece # 3					**Piece # 4**				
Average					**Average**				
Error					**Error**				
Piece # 5					**Piece # 6**				
Average					**Average**				
Error					**Error**				
Piece # 7					**Piece # 8**				
Average					**Average**				
Error					**Error**				
Piece # 9					**Piece # 10**				
Average					**Average**				
Error					**Error**				
Piece # 11					**Piece # 12**				

Average					**Average**						
Error					**Error**						

Table 2-8. MAV for Packages Labeled by Length, Width or Area

1 m (1 YD) or less is 3 % of labeled quantity

More than 1 m (1 YD) to 43 m (48 YD) is 1.5 % of labeled quantity

Section 1. Compliance with Maximum Allowable Variation

1. **Calculate the MAV for labeled thickness (i.e., 0.03 × thickness =) __________. Do any of the average minus errors for thickness exceed the MAV?**
   a) **If yes, the sample fails. Go to Section 5 and select "Lot Rejected."**
   b) **If no, go to Step 2.**

2. **Calculate the MAV for labeled length (i.e., 0.015 × length =) ___________. Do any of the average minus errors for length exceed the MAV?**
   a) **If yes, the sample fails. Go to Section 5 and select "Lot Rejected."**
   b) **If no, go to Step 3.**

3. **Calculate the MAV for labeled width (i.e., 0.015 × width =) ___________. Do any of the average minus errors for width exceed the MAV?**
   a) **If yes, the sample fails. Go to Section 5 and select "Lot Rejected."**
   b) **If no, proceed to Section 2.**

Section 2. Compliance with the Average Requirement – Thickness

4. **Calculate the Average Error for labeled thickness __________. The sample passes this requirement if the Average Error is zero or a positive number. Go to Section 3. If the Average Error is a negative number, go to Step 5.**

5. **Calculate the Sample Standard Deviation (*s*) and multiply (*s*) by the Sample Correction Factor (*SCF*) for the sample size to obtain the Sample Error Limit (*SEL*). Go to Step 6.**

   ***(s)*_______________ × (*SCF*)____________ = *SEL*________________**

6. **Disregarding the signs, is the *SEL* in 5 larger than the Average Error in 4? If yes, the sample passes, go to Section 3. If no, the sample fails, go to Section 5 and select "Lot Rejected.".**

Section 3. Compliance with the Average Requirement – Length

7. **Calculate the Average Error for labeled length ___________. The sample passes this requirement if the Average Error is zero or a positive number. Go to Section 4. If the Average Error is a negative number, go to Step 8.**

8. **Calculate the Sample Standard Deviation (*s*) and multiply (*s*) by the Sample Correction Factor (*SCF*) for the sample size to obtain the Sample Error Limit (*SEL*). Go to Step 9.**

(s)* × (*SCF*) = *SEL   **9. Disregarding the signs, is the *SEL* in 8 larger than the Average Error in 7? If yes, the sample passes, go to Section 5 and select "Lot Approved". If no, the sample fails, go to Section 5 and select "Lot Rejected."**
Section 4. Compliance with the Average Requirement – Width   **10. Calculate the Average Error for labeled width _________. The sample passes this requirement if the Average Error is zero or a positive number. Go to Section 5. If the Average Error is a negative number, go to Step 11.**   **11. Calculate the Sample Standard Deviation (*s*) and multiply (*s*) by the Sample Correction Factor (*SCF*) for the sample size to obtain the Sample Error Limit (*SEL*). Go to Step 12.**   ***(s)* × (*SCF*) = *SEL***   **12. Disregarding the signs, is the *SEL* in 11 larger than the Average Error in 10? If yes, the sample passes, go to Section 5 and select "Lot Approved". If no, the sample fails, go to Section 5 and select "Lot Rejected."**
Section 5. Action Taken: ☐ Lot Rejected ☐ Lot Approved
Random Numbers: enter the numbers as you select them in the top row and reorder them in the bottom row.

Background/Discussion:

(This item appeared on the 2017 Fall Regional reports as Item NEW-12. On the 2018 NCWM Interim and Annual Reports it appeared as NET-2.)

Currently there is no test procedure for plywood and wood-based structural panels in NIST HB133. This procedure follows good measuring practices for products sold by linear measure. Over the past several years' states have requested guidance for a test procedure that determines the accuracy of plywood and wood-based structural panels. This procedure was developed with the input from Steve Zylkowski, Director, Quality Services Division, Engineered Wood Association (APA). APA was previously known as the American Plywood Association. When their name changed, it was decided to leave the acronym APA because it was so well established. (APA 7011 S. 19th Street, Tacoma, WA 98466 PH: (253) 620-6600 **www.apawood.org**.

At the 2018 NCWM Interim Meeting comments were received from regulators and industry supporting this item as Informational. Mr. Steve Zylkowski (American Plywood Association) recommended this item remain Informational to await PS1 and PS2 standards that are currently being reviewed. Based on the comments received the L&R Committee recommends this item as Developing to allow NIST to review additional information received from the PS1 and PS2 voluntary standards update.

At the 2018 NCWM Annual Meeting the Committee reviewed the modified language submitted by NIST OWM on June 26, 2018. In addition Mr. Zylkowski (APA) supports this proposal and provided the Committee with research and supporting documents.

Regional Association Comments:
At the 2017 WWMA Annual Meeting, Ms. Lisa Warfield (NIST Technical Advisor), commented that the Voluntary Product Standards Group is meeting at the beginning of December, and may have changes to the following documents; PS 1-09 "Structural Plywood" and the PS 2-10 "Performance Standard for Wood-Based Structural-Use-Panels" which may impact the test procedure. This item is not completely developed and should be placed as an Informational Item.

At the 2017 SWMA Annual Meeting, Ms. Lisa Warfield remarked that NIST OWM worked with the Engineered Wood Association to develop this proposal. After NIST OWM submitted the Form 15 proposal, we were informed that there may be changes coming to PS1 and PS2. However, they are not meeting to discuss this until Dec. 6 – 7, 2017. If there are additional changes we will notify the L&R Committee at the 2018 NCWM Interim Meeting. The SMWA is recommending this as an Informational item.

At the 2017 CWMA Interim Meeting, the CWMA did not take a position on this item. At the 2018 CWMA Annual Meeting, Ms. Lisa Warfield commented there is currently no test procedure for this item and is concerned that the Developing status will not allow industry to comment at open hearings. She commented that representatives from the National L&R Committee present at the Northeast Weights and Measures Association agreed to allow comments for this item at the Annual Meeting, despite of the Developing status.

At the 2017 NEWMA Interim Meeting, a state regulator remarked that most jurisdictions will not have, nor will it be necessary to have either a Vernier caliper or gage blocks for assessment of compliance with this commodity. A state regulator from New York commented that a steel tape would be a more appropriate standard for conducting inspections with this commodity. A retired state regulator from New York agrees. NEWMA believes this should move forward as a Developing item with a review of the inspection procedure regarding practicality in the field. At the 2018 NEWMA Annual Meeting, Lisa Warfield commented that she received a letter from the APA, and asked the Committee to consider moving this item from Developing to Informational to allow for industry to comment at 2018 NCWM Annual Meeting. Ms. Warfield believes the item is fully developed and only minor editorial changes would be made to the PS1 and PS2 voluntary standards. NEWMA recommends that NCWM L&R take comments on this Developmental item at the 2018 NCWM Annual Meeting

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to **www.ncwm.net/meetings/annual/publication-16** to review these documents.

NET-5 VC Appendix A: Tables 1.1. Agencies Responsible for Package Regulations and Applicable Requirements and 2.9. U.S. Department of Agriculture, Meat and Poultry<u>, and Siluriformes</u> Groups and Lower Limits for Individual Packages (Maximum Allowable Variations [MAVs])

(This item was Adopted)

Source:
NIST OWM (2018)

Purpose:
Update NIST Handbook 133 to align with regulations from the USDA, Food Safeway and Inspection Service.

Item under Consideration:
Amend NIST Handbook 133 as follows:

Table 1-1. Agencies Responsible for Package Regulations and Applicable Requirements

Commodity	Responsible Agency	NIST Handbook 133 Sampling Plans	Table of Maximum Allowable Variations
Meat, ~~and~~ Poultry, and Siluriformes* ***Siluriformes include, but are not limited to, "catfish" (fish of the family Ictaluridae) and "basa" and "swai" (fish of the family Pangasiidae.**	U.S. Department of Agriculture, Food Safety and Inspection Service and state and local weights and measures.	**Use Table 2-1.** Sampling Plans for Category A to test packages at other than point of pack. **Use Table 2-2.** Sampling Plans for Category B to test packages in federally inspected meat and poultry plants.	**Table 2-9**. U.S. Department of Agriculture, Meat, ~~and~~ Poultry, **and Siluriformes** Groups and Lower Limits for Individual Packages
Foods, drugs, and cosmetics subject to the Food, Drug, and Cosmetic Act including those packaged at the retail store level that have been in interstate commerce (e.g., seafood) or those made with ingredients that have been in interstate commerce and beer made from substitutes for malted barley (e.g., sorghum, rice, or wheat) and wine beverages with an alcohol content of less than 7 % by volume	U.S. Food and Drug Administration and state and local weights and measures **www.fda.gov**	**Use Table 2-1.** Sampling Plans for Category A to test packages at all locations.	**Table 2-5.** MAVs for Packages Labeled by Weight **Table 2-6**. MAVs for Packages Labeled by Liquid or Dry Volume **Table 2-7.** MAVs for Packages Labeled by Count **Table 2-8.** MAVs for Packages Labeled by Length (Width) or Area **Table 2-10.** Exceptions to the MAVs for Textiles, Polyethylene Sheeting and Film, Mulch and Soil Labeled by Volume, Packaged Firewood Labeled in Terms of Volume, and Packages Labeled by Count with 50 Items or Fewer, and Specific Agriculture Seeds Labeled by Count
Tobacco	U.S. Food and Drug Administration and local weights and measures. **www.fda.gov**		
Food products not subject to the Federal Food, Drug, and Cosmetic Act, including meat and poultry products packaged at the retail store level	State and local weights and measures **www.nist.gov/wmd/**		
Non-food Consumer Products	Federal Trade Commission **www.ftc.gov**		

Table 1-1. Agencies Responsible for Package Regulations and Applicable Requirements			
Commodity	**Responsible Agency**	**NIST Handbook 133 Sampling Plans**	**Table of Maximum Allowable Variations**
Non-food Consumer and Non-Consumer Products	State and local weights and measures		
Alcohol Products, except for beer made from substitutes for malted barley (e.g., sorghum, rice, or wheat) and wine beverages with an alcohol content of less than 7 % by volume, which are regulated by FDA	Alcohol and Tobacco Tax and Trade Bureau. State and local weights and measures **www.ttb.gov**	**Use Table 2-1.** Sampling Plans for Category A to test packages at all locations.	**Table 2-5.** MAVs for Packages Labeled by Weight **Table 2-6**. MAVs for Packages Labeled by Liquid or Dry Volume **Table 2-7.** MAVs for Packages Labeled by Count **Table 2-8.** MAVs for Packages Labeled by Length (Width) or Area **Table 2-10.** Exceptions to the MAVs for Textiles, Polyethylene Sheeting and Film, Mulch and Soil Labeled by Volume, Packaged Firewood and Stovewood Labeled in Terms of Volume, and Packages Labeled by Count with 50 Items or Fewer, and Specific Agriculture Seeds Labeled by Count
Pesticides	U.S. Environmental Protection Agency and state and local weights and measures **www.epa.gov**		

(Added 2018)

Table 2-9. U.S. Department of Agriculture, Meat ~~and~~ Poultry, and Siluriformes Groups and Lower Limits for Individual Packages (Maximum Allowable Variations [MAVs])

Definition of Group and Labeled Quantity		Lower Limit for Individual Weights (MAVs)
Homogenous Fluid When Filled (e.g., baby food or containers of lard)	**All Other Products**	
Less than 85 g or 3 oz		10 % of labeled quantity
85 g or more to 453 g 3 oz or more to 16 oz		7.1 g 0.016 lb (0.25 oz)
More than 453 g More than 16 oz	85 g or more to 198 g 3 oz to 7 oz	14.2 g 0.031 lb (0.5 oz)
	More than 198 g to 1.36 kg 7 oz to 48 oz	28.3 g 0.062 lb (1 oz)
	More than 1.36 kg to 4.53 kg More than 48 oz to 160 oz	42.5 g 0.094 lb (1.5 oz)
	More than 4.53 kg More than 160 oz	1 % of labeled quantity

(Amended 2018)

Background/Discussion:

(This item appeared on the 2017 Fall Regional reports as Item NEW-8. On the 2018 NCWM Interim and Annual Reports it appeared as NET-5.)

The Department of Agriculture, Food Safety and Inspection Service announced that Siluriformes include but are not limited to, ''catfish'' (fish of the family Ictaluridae) and ''basa'' and ''swai'' (fish of the family Pangasiidae). NIST Handbook 133 needs to be updated to inform the users of this federal regulation. This change impacts Appendix A, Table 1-1 Agencies Responsible for Package Regulations and Applicable Requirements and Table 2-9 U.S. Department of Agriculture, Meat and Poultry Groups and Lower Limits for Individual Packages (Maximum Allowable Variations [MAVs)

No comments were received on this item at the 2018 Interim Meeting. The L&R Committee believes this item is fully developed and recommends this be a Voting item.

Regional Association Comments:
At the 2017 WWMA Annual Meeting, the Committee believes this item is fully developed and recommends it move forward as a Voting Item.

At the 2017 SWMA Annual Meeting, the NIST Technical Advisor remarked that this will update Appendix A. - Table 1.1., "Agencies Responsible for Responsibility Chart" to add that USDA Food Safety Inspection Service to include the responsibility for Siluriformes (catfish). In addition, it modifies MAV Table 2-9 to add Siluriformes (catfish) to the title.

At the 2017 CWMA Interim Meeting, the Committee believes this item is fully developed and ready for voting status. The Committee questioned why local weights and measures are included and state weights and measures are not included under Table 1-1., Agencies Responsible for Package Regulations and Applicable Requirements for tobacco enforcement. The CWMA recommended that it be a Voting item. No comments were heard at the CWMA 2018 Annual Meeting.

At the 2017 NEWMA Interim Meeting and 2018 NEWMA Annual Meeting, no comments were heard.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to **www.ncwm.net/meetings/annual/publication-16** to review these documents.

NET-6 D Recognize the Use of Digital Density Meters

Source:
Missouri (2016)

Purpose:
Allow the use of digital density meters for package checking testing of viscous fluids such as motor oils, diesel exhaust fluid (DEF) and antifreeze.

Item under Consideration:
Amend NIST Handbook 133 as follows:

Develop specific test procedures for NIST Handbook 133, "Chapter 3. Test Procedures – For Packages Labeled by Volume" that would recognize the use of digital density meters in lieu of volumetric flasks and thermometers when testing certain viscous fluids such as motor oil, DEF, antifreeze, syrups, etc.

Background/Discussion:

(This item appeared on the 2017 Fall Regional reports as Item 2600-3. On the 2018 NCWM Interim and Annual Reports it appeared as they appear as NET-6.

This item has been assigned to the submitter for further development. For more information or to provide comment, please contact:

Ronald Hayes
Missouri Department of Agriculture
(573-751-4316), **ron.hayes@mda.mo.gov**

Current test procedures are slow and awkward due to the need of using borosilicate glassware for package checking. Digital density meters are fast, use small samples size (2 ml) and have built in thermometers.

Digital density meters are fast and accurate in comparison with recognized Handbook 133 test procedures for viscous fluids. Using digital density meters equipped with built-in API density tables will not require the cooling samples to 60 °F. There is no need to "wet down" volumetric flasks before each measurement. Most non-food products may be recovered without contamination. Only a small sample size (2 ml) of the product is needed for testing. There is no need for a partial immersion thermometer or volumetric flasks. The current method in "Section 3.4. Volumetric Test Procedures for Viscous Fluids – Headspace" does not work for plastic oblong bottles often used for motor oil. This new test procedure would eliminate the entrapment of air in testing viscous fluids (i.e. motor oil, DEF, antifreeze, syrups, etc.) Well established ASTM and other international standard test methods are available with precision statements.

At the 2016 NCWM Interim Meeting, Ron Hayes (Missouri) spoke in regard to this proposal. The Committee believes this item has merit and requested that the submitter form a focus group to further develop. Mr. Hayes agreed that this item needs have additional data gathered to support the use and accuracy of the digital density meters. The American Petroleum Institute (API) remarked that they would like to assist the task group on this project. The Committee is making this a Developing Item.

At the 2017 Interim Meeting the submitter Ron Hayes (MO) asked for the states participation in a round robin to compare the current handbook test procedures with the density meter. The Committee encouraged the submitter to develop a proposal by Fall 2017.

At the 2018 Interim Meeting, Mr. Ron Hayes (MO) gave a presentation regarding this item. Mr. Lou Sakin (Massachusetts) recommended this item be assigned with a specific timetable for development. No other comments were heard on this developing item. The L&R Committee recommends this item as Developing to allow the submitter to finish developing test procedures and review with NIST/OWM staff.

At the 2018 NCWM Annual Meeting, Mr. Hayes (MO) provided an updated that he has been doing testing and getting repeatability with his results. Mr. Hayes remarked that when NIST OWM was teaching a NIST Handbook 133- Basic course in MO he had an opportunity to use the density meter on some of the test procedures.

Regional Association Comments:
At the 2017 WWMA and SWMA Annual Meetings, they recommended this be a Developing Item.

At the 2017 CWMA Annual Meeting, Mr. Hayes gave a presentation comparing test methods between the traditional flask method and digital density meters. The Committee believed that the concept has merit after watching the presentation. Testing procedures are being developed and will be reviewed by NIST prior to voting by the NCWM. The CWMA recommended that it remain a Developing item. At the 2018 CWMA Annual Meeting, Mr. Ron Hayes commented that additional field data has been collected, and there is good volumetric equivalence. He is willing to share information with states that have already purchased a digital density meter. He commented that there are multiple manufacturers that produce these meters. He hopes to get assistance for the final draft of the proposal to share with the Conference.

At the 2017 NEWMA Interim Meeting, there has been proposal to come forward since 2016 they are recommending it be withdrawn.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to **www.ncwm.net/meetings/annual/publication-16** to review these documents.

OTH – OTHER ITEMS

OTH-1 D Fuels and Lubricants Subcommittee

Source:
The Fuels and Lubricants Subcommittee (2007)

Purpose:
Update the Uniform Engine Fuels, Petroleum Products, and Automotive Lubricants Regulation in NIST Handbook 130 including major revisions to fuel ethanol specifications. Another task will be to update the Basic Engine and Fuels, Petroleum Products, and Lubricants Laboratory Publication.

Item under Consideration:
This item is under development. All comments should be directed to Dr. Bill Striejewske, FALS Chair at (775) 353-3792, **wstriejewske@agri.state.nv**, or Ms. Lisa Warfield, NIST Technical Advisor at (301) 975-3308, **lisa.warfield@nist.gov**.

Background/Discussion:

(This item appeared on the 2017 Fall Regional reports as Item 2700-1. On the 2018 NCWM Interim and Annual Report it appears as OTH-1.)

The Subcommittee met on Sunday, January 8, 2017, at the NCWM Interim Meeting in San Antonio, TX to review a few significant issues related to fuel and automotive fluid standards appearing before the L&R Committee. The meeting began with an update from an agenda review teleconference, which was held on Tuesday, January 3, 2017. There were four items on the L&R agenda with two additional related items in the Method of Sale Section that were discussed by FALS. The meeting also consisted of updates from four focus groups working within FALS; further discussion on some of the agenda items; and several presentations from FALS members. Summaries of the focus groups are detailed below. Finally, the subcommittee discussed membership and voting guidelines that would be applied to agenda items and issues addressed within FALS.

The Subcommittee met on Sunday, July 16, 2017, at the NCWM Annual Meeting in Pittsburgh, PA to review several significant issues related to fuel and motor vehicle fluid standards appearing before the L&R Committee. The meeting began with an update from an agenda review teleconference, which was held on Thursday, June 8, 2017. There were four items on the L&R agenda with two additional related items in the Method of Sale Section that were discussed by FALS. Item 2307-2 related to Ethanol Flex Fuels was discussed at the meeting as the submitter was not able to attend the agenda review teleconference. The meeting also consisted of updates from the four focus groups working within FALS.

The Subcommittee met on Sunday January 21, 2018, at the NCWM Interim Meeting in St. Pete Beach, FL to review several significant issues related to fuel and automotive fluid standards appearing before the L&R Committee. There were five blocks encompassing 15 Items on the L&R agenda. There were also updates provided by one of the focus groups within FALS.

At the 2018 NCWM National Meeting in Tulsa, OK, FALS reviewed the four item blocks (block 2, 3, 4, and 5 [13 items total]) and one FLR item on the L&R agenda. It was recommended that Item Block 4, Gasoline and Gasoline with Ethanol be withdrawn. There will also be a presentation along with discussion of these items at the fall regional meetings.

Summaries of the focus groups are detailed below:

Premium Diesel Focus Group: At the 2017 NCWM Annual Meeting Mr. Manuch Nickanjam (Chevron Global Downstream) gave a brief presentation on the efforts of focus group thus far noting that the group's work is nearly complete. Once complete the group will bring the work before the FALS membership for discussion and consideration. At the FALS work session held Sunday at the 2018 Interim NCWM Meeting Randy Jennings (TN) gave a review of the FG's work (L&R Pub. 15 – Item OTH-1 and L&R Pub. 16 – Item FLR-9). He said that there are a few items that still to be vetted, but within the next year the group will have a proposal for FALS to review.

In addition, two presentations were provided at the 2018 FALS Interim work session. Mr. Scott Mason (Phillips 66) presented information from his company on an anti-skimming toolkit as a compliment to Wednesday's NCWM outing on credit card enforcement. His presentation was in the form of a toolkit, specifically addressing good security practices, some examples of different skimmers (both in-line and overlay), and proper use of dispenser tape and labels. The Phillips 66 toolkit and additional information are located on-line under the NCWM L&R supporting documents. Ms. Amanda Appelbaum (Fuel Quality Institute) provided a brief update of their mission and activities. A wealth of information can be found at their website, fuelsinstitute.org.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to **www.ncwm.net/meetings/annual/publication-16** to review these documents.

OTH-2 D Packaging and Labeling Subcommittee

Source:
Packaging and Labeling Subcommittee (2011)

Purpose:
Provide an update of the activities of this Subcommittee which reports to the L&R Committee. The mission of PALS is to assist the L&R Committee in the development of agenda items related to packaging and labeling. The Subcommittee will also be called upon to provide important and much needed guidance to the regulatory and consumer packaging communities on difficult questions. PALS will report to NCWM L&R Committee. The Subcommittee is comprised of a Chairperson and eight voting members.

Item under Consideration:
This item is under development. This item is to provide a report on the activities of the Packaging and Labeling Subcommittee which reports and provides recommendations to the Laws and Regulations Committee. For more information or to provide comment, please contact:

Mr. Chris Guay
Chairman Packaging and Labeling Subcommittee
(513) 983-0530, guay.cb@pg.com

or

Mr. David Sefcik
NIST Technical Advisor
(301) 975-4868, david.sefcik@nist.gov

Background/Discussion:

(This item appeared on the 2017 Fall Regional reports as Item 2700-2. On the 2018 NCWM Interim and Annual Report it appeared as OTH-2)

The Package and Labeling Subcommittee (PALS) is comprised of four voting regulatory officials (one from each region) and four voting members from industry (retailers and manufacturers) in addition to its Chairman and NIST Technical Advisor. Mr. Guay, PALS Chair, reported that work is currently being held through monthly webinar meetings and at the NCWM meetings. Members of NCWM can participate in the PALS webinar meetings by contacting Mr. Guay. PALS members are responsible for providing updates at their Regional Meetings. Mr. Guay added that PALS will be developing proposals and providing guidance and recommendations on existing proposals as assigned by the NCWM L&R Committee. He also stressed the importance of having key federal agencies (FDA, FTC, and USDA) participating.

The Subcommittee is currently working on developing a Recommended Best Practice Document for quantity expressions appearing on the principal display panel (PDP) in addition to the required statement of net quantity and is beginning to evaluate the development of principles for products intended for e-Commerce sale (products which a consumer purchases remotely from a website which are then shipped to consumer).

A Recommended Best Practice Document for quantity expressions is expected to help bring uniformity and consistency by providing a reference for these types of label statements. This document will either be a stand-alone document on the NCWM website a NCWM publication.

Principles regarding e-Commerce sales would help promote uniformity by clarifying the expectations for all parties regarding information available to the consumer at the point of sale and at the point of receipt.

In addition, PALS is considering further development of the following items:

- **Additional Net Content Declarations on the Principal Display Panel to Meet U.S. and International Requirements** - Package net contents are most commonly determined by the product form, for example – solid products are labeled by weight and liquid products are labeled by volume. Semi-solid products such as pastes, creams and viscous liquids are required to be labeled by weight in the United States and by volume in Canada.
- **Icons in Lieu of Words in Packaged labeled by Count** – Can a clear and non-misleading icon take the place of the word “count” or “item name” in a net content statement? While existing Federal regulation requires regulatory label information to be in “English,” the increasing presence of multilingual labels and the growing diversity of the U.S. population suggest more consumers are served with a clear and non-misleading icon.
- **Multipacks and Bundle Packages** - The net content statements for multipacks and bundled packages of individually labeled products can be different based on the approach used to calculate them. The difference

is the result of the degree of rounding for dual inch-pound and metric declarations. Using two apparently valid but different methods can yield two different results; one net content statement result that provides closer accuracy between the declared metric and U.S. customary declaration, or a different net content result which is more intuitive but less accurate.

At the 2017 NCWM Interim Meeting, Ms. Ann Boeckman (Heinz Kraft and PALS Member) provided a presentation to the PALS summarizing the history of the U.S. Fair Packaging and Labeling Act, FTC's FPLA regulations, and positions taken by FTC when questions were referred to the Agency. The PALS Committee is planning to contact FTC and FDA to discuss the how PALS can provide guidance to manufacturers consistent with FTC and FDA requirements and interpretations.

At the 2017 Annual Meeting, PALS met with a representative of the FDA to provide a detailed overview of the background, development, and status of the developing Recommended Best Practice Document. While also invited, FTC was unable to attend this meeting. PALS is planning to continue development of this document and continue outreach to the Federal Agencies as it works to finalize the first draft of the document. PALS plans to share the Best Practice Document with NCWM members for input once the draft is complete.

At the 2018 Interim Meeting, Mr. Guay reported that PALS was making good progress on a Recommended Best Practice Document for quality related statements appearing on the package net contents statement outside of the required statement of net quantity. A completed first draft is expected later in 2018. A Recommended Best Practice Document is expected to bring uniformity and consistency by providing a reference for these types of label expressions. This document will either be a stand-alone document on the NCWM website or an NCWM publication.

At the 2018 Annual Meeting, Mr. Guay reported the first draft of the Recommended Best Practice Document for quantity-related statements appearing the package net content statement outside of the required statement of net quantity is expected to be completed before the end of 2018. Once complete, PALS will share the document with NCWM members who have volunteered to review the document. Once this step is complete, PALS will request a meeting with FDA to solicit further input.

In addition, PALS has started work on developing principles for e-Commerce product sales to clarify the expectations regarding packaging and labeling requirements.

Mr. Ethan Bogren, Westchester County, New York | Committee Chair
Mr. John Albert, Missouri | Member
Ms. Michelle Wilson, Arizona | Member
Mr. Hal Prince, Florida | Member
Mr. John McGuire, New Jersey | Member
Ms. Rebecca Richardson, MARC-IV Consulting | AMC Representative
Mr. Lance Robertson, Measurement Canada | Canadian Technical Advisor
Ms. Lisa Warfield, NIST OWM | Technical Advisor
Mr. David Sefcik, NIST OWM | Technical Advisor

Laws and Regulations Committee

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Appendix A-1
Item: NET-3: Softwood
"Moisture Relations and Physical Properties of Wood"

Title: Wood Handbook, Chapter 04: Moisture Relations and Physical Properties of Wood
Publication: General Technical Report FPL-GTR-190. Madison, WI: U.S. Department of Agriculture, Forest Service, Forest Products Laboratory: 4-1 - 4-19. Chapter 4.
Author(s): Glass, Samuel V; Zelinka, Samuel L.
Year: 2010
URL: www.fpl.fs.fed.us/documnts/fplgtr/fplgtr190/chapter_04.pdf
Date Accessed: June 27, 2019

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Appendix A-2
Item: NET-3: Softwood
"Drying and Control of Moisture Content and Dimensional Changes"

Title: Wood Handbook, Chapter 12: Drying and Control of Moisture Content and Dimensional Changes
Publication: General Technical Report FPL-GTR-113. Madison, WI: U.S. Department of Agriculture, Forest Service, Forest Products Laboratory: 12-1 – 12-20. Chapter 12.
Author(s): Simpson, William T.
Year: 1999
URL: www.fpl.fs.fed.us/documnts/fplgtr/fplgtr113/ch12.pdf
Date Accessed: June 27, 2019

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Appendix A-3
Item: NET-3: Softwood
"Moisture-Related Properties of Wood and the Effects of Moisture on Wood and Wood Products"

Title: Moisture-Related Properties of Wood and the Effects of Moisture on Wood and Wood Products
Publication: Moisture Control in Buildings: The Key Factor in Mold Prevention—2nd Edition, ed. Trechsel, H. and Bomberg, M. (West Conshohocken, PA: ASTM International, 2009), 54-79.
Author(s): Carll, Charles; Wiedenhoeft, Alex
Year: 2009
URL: **https://doi.org/10.1520/MNL11544M**
Date Accessed: June 27, 2019

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Appendix A-4
Item: NET-3: Softwood
"Moisture Content and the Shrinkage of Lumber"

Title: Moisture Content and the Shrinkage of Lumber
Publication: Res. Pap. FPL-RP-489. Madison, WI: U.S. Department of Agriculture, Forest Service, Forest Products Laboratory. 11 p.
Author(s): Green, David
Year: 1989
URL: **www.fpl.fs.fed.us/documnts/fplrp/fplrp489.pdf**
Date Accessed: June 27, 2019

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Appendix B-1
Item: NET-4: Plywood and Wood-Based Structural Panels
"Dimensional Stability of Structural-Use Panels"

Title: Dimensional Stability of Structural-Use Panels
Publication: Report Number R&D86L-43. Tacoma, WA: American Plywood Association.
Author(s): Zylkowski, Steven
Year: 1986
URL: **www.ncwm.net/_resources/e30d:pb9c98-2nb/files/76076568zdd52173d/_fn/NET-4-1986%20APA%20Report-2018-07-02.pdf**
Date Accessed: June 27, 2019

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Appendix B-2
Item: NET-4: Plywood and Wood-Based Structural Panels “Moisture-Related Dimensional Stability”

Title: Moisture-Related Dimensional Stability
Publication: Report TT-028B. Tacoma, WA. American Plywood Association: The Engineered Wood Association.
Author(s): American Plywood Association
Year: 2010
URL: www.roseburg.com/UserFiles/Library/Moisture_related_Dimensional_Stability.pdf
Date Accessed: June 27, 2019

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Appendix B-3
Item: NET-4: Plywood and Wood-Based Structural Panels
"Linear Expansion and its Relationship to Moisture Content Change for Commercial Oriented Strandboards"

Title: Linear Expansion and its Relationship to Moisture Content Change for Commercial Oriented Strandboards
Publication: Forest Products Journal, Forest Products Society, VOL 46, No. 11/12: 79-83.
Author(s): Wu, Qinglin; Suchsland, Otto
Year: 1995
URL: **www.ncwm.net/_resources/e30d:pb9c9a-2nb/files/76076570zca92ae4e/_fn/NET-4-Linear%20Expansion%20Related%20to%20Moisture-2018-07-02.pdf**
Date Accessed: June 27, 2019

NOTE: The publication text that follows retains its original page numbering.

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Appendix B-4
Item: NET-4: Plywood and Wood-Based Structural Panels "Moisture-Related Properties of Wood and the Effects of Moisture on Wood and Wood Products"

Title: Moisture-Related Properties of Wood and the Effects of Moisture on Wood and Wood Products
Publication: Moisture Control in Buildings: The Key Factor in Mold Prevention—2nd Edition, ed. Trechsel, H. and Bomberg, M. (West Conshohocken, PA: ASTM International, 2009), 54-79.
Author(s): Carll, Charles; Wiedenhoeft, Alex
Year: 2009
URL: **https://doi.org/10.1520/MNL11544M**
Date Accessed: June 27, 2019

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Specifications and Tolerances (S&T) Committee 2018 Final Report

Mr. Ivan Hankins, Committee Chair
Iowa

3000 INTRODUCTION

This is the final report of the Committee on Specifications and Tolerances (S&T) (hereinafter referred to as the "Committee") for the 102nd Annual Meeting of the National Conference on Weights and Measures (NCWM). This report is based on the Interim Report offered in the NCWM Publication 16, "Committee Reports," testimony at public hearings, comments received from the regional weights and measures associations and other parties, the addendum sheets issued at the Annual Meeting, and actions taken by the membership at the voting session of the Annual Meeting. The Informational items shown below were adopted as presented when this report was approved. This report contains those recommendations to amend National Institute of Standards and Technology (NIST) Handbook 44 (2017), "Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices."

Table A identifies the agenda and appendix items by reference key, title of item, page number, and the appendices by appendix designations. The acronyms for organizations and technical terms used throughout the agenda are identified in Table B. The first four digits of the Reference Key Numbers of the items are assigned from the Subject Series List. The status of each item contained in the report is designated as one of the following: **(D) Developing Item:** the Committee determined the item has merit; however, the item was returned to the submitter or other designated party for further development before any action can be taken at the national level; **Informational (I) Item:** the item is under consideration by the Committee but not proposed for Voting; **(V) Voting Item:** the Committee is making recommendations requiring a vote by the active members of NCWM; **(W) Withdrawn Item:** the item has been removed from 9consideration by the Committee.

Table C provides a summary of the results of the voting on the Committee's items and the report in its entirety. Some Voting Items are considered individually; others may be grouped in a consent calendar. Consent calendar items are Voting Items that the Committee has assembled as a single Voting Item during their deliberation after the open hearings on the assumption that the items are without opposition and will not require discussion. The Voting Items that have been grouped into consent calendar items will be listed on the addendum sheets. Prior to adoption of the consent calendar, the Committee entertains any requests from the floor to remove specific items from the consent calendar to be discussed and voted upon individually.

Proposed revisions to the handbook(s) are shown as follows: 1) deleted language is indicated with a **bold face font using ~~strikeouts~~** (e.g., **~~this report~~**), 2) proposed new language is indicated with an **underscored bold-faced font** (e.g., **new items**), and 3) nonretroactive items are identified in *italics*. When used in this report, the term "weight" means "mass."

Note: It is the policy of NIST to use the International System of Units (SI) (the metric system) in publications; however, recommendations received by NCWM technical committees and regional weights and measures associations have been printed in this publication as submitted. Therefore, this report may contain references to units of the U.S Customary System of Measurement.

Subject Series List

Table A
Table of Contents

Table B
Glossary of Acronyms and Terms

Acronym	Term	Acronym	Term
ABWS	Automatic Bulk Weighing System	NEWMA	Northeastern Weights and Measures Association
AAR	Association of American Railroads	NIST	National Institute of Standards and Technology
API	American Petroleum Institute	NTEP	National Type Evaluation Program
CNG	Compressed Natural Gas	OIML	International Organization of Legal Metrology
CIM	Coupled-in-Motion	OWM	Office of Weights and Measures
CWMA	Central Weights and Measures Association	RMFD	Retail Motor Fuel Dispenser
EPO	Examination Procedure Outline	S&T	Specifications and Tolerances
GMM	Grain Moisture Meter	SD	Secure Digital
GPS	Global Positioning System	SI	International System of Units
HB 44	NIST Handbook 44	SMA	Scale Manufactures Association
HB 130	NIST Handbook 130	SWMA	Southern Weights and Measures Association
LMD	Liquid Measuring Devices	TC	Technical Committee
LNG	Liquefied Natural Gas	TG	Task Group
LPG	Liquefied Petroleum Gas	USNWG	U.S. National Work Group
MMA	Meter Manufacturers Association	VTM	Vehicle Tank Meter
MDMD	Multiple Dimension Measuring Device	WIM	Weigh-in-Motion
NCWM	National Conference on Weights and Measures	WWMA	Western Weights and Measures Association

Table C
Summary of Voting Results

Reference Key Number	*House of State Representatives*		*House of Delegates*		*Results*
	Yeas	*Nays*	*Yeas*	*Nays*	
Consent Calendar: LPG-1, CLM-3, WTR-2, CDL-3, TXI-1	41	0	56	0	Adopted
SCL-6	34	6	50	6	Adopted
ABW-4	28	12	39	13	Adopted
LMD-2	38	2	49	6	Adopted
VTM-1	41	0	54	1	Adopted
To Accept the Report	Voice Vote				Adopted

Details of All Items
(In order by Reference Key)

BLOCK 1 ITEMS (B1) MANIFOLD FLUSH SYSTEMS

B1: GEN-1 W G-S.2. Facilitation of Fraud.
B1: VTM-1A V S.3. Diversion of Measured Liquid and UR.2.6. Clearing the Discharge Hose.
B1: VTM-1B I S.3.1.1. Means for Clearing the Discharge Hose and UR.2.6. Clearing the Discharge Hose.

Source:
New York (2018) (GEN-1, VTM 1-A); New York and NIST OWM (VTM 1-B)

Purpose:
Provide specifications and user requirements for manifold flush systems. Recognize there is a balance between a mechanism that provides an important safety benefit but also, if used incorrectly, facilitates fraud. Ensure VTM owners understand their responsibilities when installing such a system and ensure uniformity in enforcement throughout the country.

B1: GEN-1 W G-S.2. Facilitation of Fraud.

(This item was Withdrawn.)

Item under Consideration:
Amend NIST Handbook 44 General Code as follows**:**

G-S.2. Facilitation of Fraud. – All equipment and all mechanisms, software, and devices attached to or used in conjunction therewith shall be so designed, constructed, assembled, and installed for use such that they do not facilitate the perpetration of fraud. **Where such equipment and/or mechanism will be installed for safety purposes, the device owner must petition, in writing, the weights and measures authority having jurisdiction over the device for a waiver from this specification.**
(Amended 2007 **and 20XX**)

B1: VTM-1A A S.3. Diversion of Measured Liquid and UR.2.6. Clearing the Discharge Hose.

(This item was Adopted.)

Item under Consideration:
Amend NIST Handbook 44 Vehicle-Tank Meters Code by modifying Paragraph S.3.1. Diversion of Measured Liquid and adding new paragraphs S.3.1.1. Means for Clearing the Discharge Hose; UR.2.6. Clearing the Discharge Hose; and UR.2.6.1. Records as follows:

S.3.1. Diversion of Measured Liquid. – ~~**Except on equipment used exclusively for fueling aircraft,**~~ ~~**n**~~**N**o means shall be provided by which any measured liquid can be diverted from the measuring chamber of the meter or the discharge line thereof. However, two or more delivery outlets may be installed if means are provided to ~~insure~~ ensure that:

(a) liquid can flow from only one such outlet at one time; and

(b) the direction of flow for which the mechanism may be set at any time is definitely and conspicuously indicated.

This paragraph does not apply to the following:

(1) **Equipment used exclusively for fueling aircraft.**

(2) **Multiple-product, single discharge hose metering systems that are equipped with systems designed to flush the discharge hose, provided the flushing system complies with the provisions of paragraph S.3.1.1. Means for Clearing the Discharge Hose.**

(Amended 2018)

S.3.1.1. Means for Clearing the Discharge Hose. - Metering systems may be equipped with systems specifically designed to facilitate clearing of the discharge hose prior to delivery to avoid product contamination. In such systems, a valve to temporarily divert product from the measuring chamber of the meter to a storage tank shall be installed only if all the following are met:

(a) **the discharge hose remains of the wet-hose type;**

(b) **the valve and associated piping are approved by the weights and measures authority having jurisdiction over the device prior to commercial use;**

(c) **the valve is permanently marked with its purpose (e.g., flush valve);**

(d) **the valve is installed in a conspicuous manner and as far from the hose reel as practical;**

(e) **the system clearly and automatically indicates the direction of product flow during operation of the flush system;**

(f) **clear means, such as an indicator light or audible alarm, is used to identify when the valve is in use; and**

(g) **no hoses or piping are connected to the inlet when it is not in use.**

(Added 2018)

UR.2.6. Clearing the Discharge Hose

UR.2.6.1. Records. - Whenever, prior to delivery, a different product is pumped through the discharge hose to avoid contamination, a record including the date, time, original product, new product, and gallons pumped shall be maintained. These records shall be kept for a period of 12 months and available for inspection by the weights and measures authority.

(Added 2018)

B1: VTM-1B I S.3. Diversion of Measured Liquid and UR.2.6. Clearing the Discharge Hose.

Item under Consideration:
Given the changes adopted in Item VTM-1A above, amend NIST Handbook 44 Vehicle-Tank Meters Code as follows**:**

S.3.1.1. Means for Clearing the Discharge Hose. – Metering systems may be equipped with systems specifically designed to facilitate clearing of the discharge hose prior to delivery to avoid product contamination. In such systems, a valve to temporarily divert product from the measuring chamber of the meter to a storage tank shall be installed only if all the following are met:

(a) the discharge hose remains of the wet-hose type;

(b) the valve and associated piping are approved by the weights and measures authority having jurisdiction over the device prior to commercial use;

(c) the valve is permanently marked with its purpose (e.g., flush valve);

(d) the valve is installed in a conspicuous manner and as far from the hose reel as practical;

(e) the system clearly and automatically indicates the direction of product flow during operation of the flush system; and

(f) clear means, such as an indicator light or audible alarm, is used to identify when the valve is in use **<u>on both quantity indications and any associated recorded representations (e.g., using such terms as "flushing mode" or "not for commercial use")</u>**;

(g) **<u>effective, automatic means shall be provided to prevent passage of liquid through any such flush system during normal operation of the measuring system; and</u>**

(h) no hoses or piping are connected to the inlet when it is not in use.

<u>(Added 2018)</u>

<u>UR.2.6. Clearing the Discharge Hose</u>

UR.2.6.1. **<u>Clearing the Discharge Hose, General. – A manifold flush or similar system designed to assist in flushing product between deliveries is not to be used or operational during a commercial transaction. The inlet valves for the system are not to be connected to any hose or piping (dust covers are permitted) when not in use. When the flushing system is in operation, the discharge hose is only to be connected to the port for the product type being flushed from the discharge line. Following the flushing process, indications and recording elements must be reset to zero prior to beginning a commercial delivery.</u>**

<u>(Added 20XX)</u>

<u>UR.2.6.2.</u> Records. – Whenever, prior to delivery, a different product is pumped through the discharge hose to avoid contamination, a record including the date, time, original product, new product, and gallons pumped shall be maintained. These records shall be kept for a period of 12 months and available for inspection by the weights and measures authority.

(Added 2018)

Background/Discussion:

Note: Agenda Item VTM-1 was split into two parts (VTM-1A and VTM-1B) at the 2018 NCWM Annual Meeting to allow a portion of VTM-1 to be voted on at the meeting and a second part to be carried over on the Committee's 2019 agenda. Additionally, VTM-1 appeared on the Committee's 2016 and 2017 agendas as Agenda Item 331-3 and 3301-2, respectively. The item was withdrawn by the Committee in 2017 and submitted as a new item, along with new Agenda Item GEN-1 in 2018.

Manifold flush systems are typically used on VTM's with multiple compartments, delivering multiple products through a single hose. The purpose of the system is to allow the driver a means of clearing the hose of product prior to delivery (e.g., clearing the hose of diesel fuel before delivering clear kerosene). These types of systems are often marketed as a safety feature in that it eliminates the need for the driver to climb on top of the truck to clear the hose. Such systems are also useful in helping avoid cross-contamination. Typically, the driver attaches the nozzle to the manifold and pumps product back into the supply tank via the manifold until the previous product is flushed from the hose. There is often a sight gauge which allows the driver to tell when the product is flushed.

The obvious concern is that this makes it very easy for the driver to circulate product through the meter prior to delivery, which goes against S.3.1. It should be noted that it also goes against S.3.1. when the driver climbs on top of the tanker and clears the hose. The distance between the flush system and the hose reel is also a factor in how easy it is for the driver to facilitate fraud.

Manifold flush systems are available from OEMs and can be found in various catalogs. Looking on multiple websites, these systems are being installed across the country and for some manufacturers seem to be standard equipment for new trucks. The submitter of VTM-1 has also seen these systems installed on trucks that are for sale where the seller notes the system as a selling point. He can foresee these systems being mandated in the future as a safety requirement and would like W&Ms to have a clear policy before that happens.

Another concern is with systems fabricated onsite. These systems are often difficult to distinguish and installed in an inconspicuous manner. While the submitter of VTM-1 has ordered many of these systems out-of-service until repaired, it can be frustrating for the owner because the truck was used in another state for years and approved by weights and measures jurisdiction in the other state. This lack of uniformity is problematic for both officials and private industry.

The submitter is not aware of any jurisdictions that prohibit such systems and believes they are valuable for safety. The submitter also does not think it would be appropriate to require multiple meters and hoses due to cost and safety concerns for driver safety. It would be acceptable to have the meter automatically print a flush ticket, but the submitter questions whether this can be done, especially for systems that have been in the marketplace for many years.

At the 2018 NCWM Interim Meeting, the Committee grouped Agenda Items GEN-1 and VTM-1 together and took comments on these items simultaneously because it considered these items related.

Mr. Mike Sikula (New York), submitter of item VTM-1, stated that the flush system is a safety feature installed to reduce the amount of times the operator would need to climb on top of the VTM tank truck. At issue is that it allows the driver to attach to a manifold and clear the lines, and it is easy to re-circulate unknown gallons of product during a delivery. The purpose of the item is to promote awareness of the system and its use, and to control use and subsequently prevent fraud. He also stated that most systems comply with current code, but he wants uniformity when evaluating these systems.

Mr. Constantine Cotsoradis (Flint Hills Resources), Mr. Kurt Floren (Los Angeles County, CA), Mr. Michael Keilty (Endress + Houser Flowtec AG USA) opposed Item GEN-1 and changes to General Code G-S.2. Facilitation of Fraud. Mr. Keilty stated the GEN-1 item weakens the General Code. Mr. Hal Prince (FL) said the item belongs in the VTM Code instead and proposed withdrawing GEN-1, making VTM-1 a Voting item. The item's submitter, Mr. Sikula was not opposed to addressing the issue solely in the VTM Code and supported VTM-1 as a Voting item.

The Committee, hearing comments in opposition to item GEN-1 and comments in support of item VTM-1 in Block 1, agreed to withdraw item GEN-1. The Committee assigned a Voting status to item VTM-1 with the following proposed language:

> **S.3.1. Diversion of Measured Liquid.** – Except on equipment used exclusively for fueling aircraft **<u>and for metering systems with multiple compartments delivering multiple products through a single discharge hose</u>**, no means shall be provided by which any measured liquid can be diverted from the measuring chamber of the meter or the discharge line thereof. However, two or more delivery outlets may be installed if means is provided to ensure that:
>
> (a) liquid can flow from only one such outlet at one time; and
>
> (b) the direction of flow for which the mechanism may be set at any time is definitely and conspicuously indicated.
>
> **<u>S.3.1.1. Means for Clearing the Discharge Hose</u>.** – **<u>For metering systems with multiple compartments delivering multiple products through a single discharge hose, means shall be provided to clear the discharge hose prior to delivery to avoid product contamination. A valve to temporarily divert product from the measuring chamber of the meter to a storage tank, shall be installed only if:</u>**

(a) the valve and associated piping are approved by the weights and measures authority having jurisdiction over the device prior to commercial use; and

(b) the valve is permanently marked with its purpose (e.g. flush valve); and

(c) the valve is installed in a conspicuous manner and as far from the hose-reel as practical; and

(d) the system clearly and automatically indicates the direction of product flow during operation; and

(e) clear means, such as an indicator light or audible alarm, is used to identify when the valve is in use; and

(f) no hoses or piping are connected to the inlet when it is not in use.

(Added 20XX)

(Amended 20XX)

and

UR.2.6. Clearing the Discharge Hose

UR.2.6.1. Records. Whenever, prior to delivery, a different product is pumped through the discharge hose to avoid contamination, a record including the date, time, original product, new product and gallons pumped shall be maintained. These records shall be kept and available for inspection by weights and measures for a period of 12 months.

(Added 20XX)

At the 2018 NCWM Annual Meeting, the Committee heard comments from OWM that this item needs additional work to address concerns that had been identified in OWM's 2018 Interim Meeting (and earlier) analyses. While there are clear benefits to improving safety when flushing hoses, OWM and others have noted these systems can facilitate fraud without appropriate safeguards in place. OWM noted the language in the Item Under Consideration in the Committee's 2018 Interim Report would provide an (unintentional) exemption to the provisions for "diversion of product" for ***all*** single meter, multiple product, multiple compartment systems; would (unintentionally) require all such systems to be equipped with a manifold flush system; fails to include requirements for the system to clearly indicate (on both display and recorded representations) when the flush system is in operation; and fails to include limitations on how the user is permitted to appropriately use these systems. In discussing the changes OWM felt were needed prior to the Annual Meeting, the submitter and OWM agreed that some of OWM's proposed changes would be considered editorial and others technical in nature. Since other than editorial changes could affect the Voting status of the item, OWM offered the following two courses of action for the Committee to consider:

1. Downgrade the item to Informational to allow time to address all the changes that are needed; or

2. Split the item into two parts to allow the portion of the item needing only editorial changes to move forward for vote; and carryover the remaining portion to allow time for it to be further developed and considered during the next NCWM cycle.

The Committee also heard comments from Mr. Jim Willis (New York, submitter of the item) who agreed with the changes OWM had identified. Rather than hold up the entire item to be considered in the next Conference cycle, the submitter requested the item be split into two parts to allow the completed portion, including the editorial changes, to move forward for vote. Mr. Dmitri Karimov (speaking on behalf of MMA and Liquid Controls), concurred with splitting the item as described and believes more work is needed to consider OWM's other proposed changes.

Mr. Hal Prince (Florida) expressed concern that proposed paragraph S.3.1.1. would necessitate allowing metering systems with multiple compartments to deliver multiple products through a single discharge hose. Such systems are currently prohibited in that official's state. The Committee considered this concern but did not believe the changes suggested by OWM and the submitter to amend paragraph S.3.1.1. would cause such an outcome.

The Committee agreed to split the item into two parts as requested by the submitter as shown above in Items VTM-1A and VTM-1B.

VTM-1A represents the portion of the item that was voted on, including the editorial changes OWM identified as needing to be completed.

VTM-1B represents the portion of the current proposal that the Committee agreed to carryover on its agenda to be considered during the 2019 NCWM Conference cycle and for which New York and NIST OWM agreed to take joint responsibility. These changes are intended to ensure such systems are designed such that they do not facilitate fraud; help ensure owners understand their responsibilities when installing such a system; and ensure uniformity in enforcement throughout the country. The changes reflect suggested language from OWM's analysis and also incorporate comments received from the MMA and others during the 2018 NCWM Annual Meeting. The submitter has suggested some of these changes be made nonretroactive to allow time for manufacturers of flush systems to incorporate the safeguards into their system. New York and OWM will welcome comments as this item is further considered.

To view the version of Agenda Item VTM-1 prior to the Committee splitting it into two parts, refer to the Item under Consideration in the Committee's 2018 Interim Report – NCWM Publication 16.

Regional Association Comments:
Neither item in this block appeared on the S&T Committee agendas of the WWMA, SWMA, CWMA, or NEWMA in 2017.

At the spring 2018 CWMA Meeting, VTM-1 was the only item in this block considered as item Gen-1 had already been withdrawn. The CWMA reported the only comment received on VTM-1 was from Mr. Richard Harshman (NIST OWM), who indicated OWM believes this item is in further need of development. The exemptions are currently too broad for S.3.1 Diversion of Measured Liquid and should only exempt trucks equipped with a manifold flush system. Also, in regard to UR.2.6., OWM questions how the records would be kept. The CWMA agreed and recommended a "Developing" status be provided.

At its spring 2018 Annual Meeting, NEWMA reported both items in this block (Gen-1 and VTM-1) had been developed enough for vote and recommended they be Voting items on the NCWM agenda.

Additional letters, presentations, and data may have been submitted for consideration with this item. Please refer to **www.ncwm.com/interim-archive** to review these documents.

BLOCK 2 ITEMS (B2) DIVISION SIZE AND TOLERANCES FOR IN-MOTION RAILWAY SYSTEMS

B2: SCL-1 D Table 3, Parameters for Accuracy Classes
B2: SCL-2 D T.N.3.6. Coupled-in-Motion Railroad Weighing Systems

Source:
Meridian Engineers Pty Ltd. (2017)

Purpose:
Reduce the required minimum scale division value for coupled-in-motion railroad weighing systems that are not used for static reference weighing.

Align the acceptance tolerance values and assign accuracy classes for coupled-in-motion railroad weighing systems with OIML R 106-1 Edition 2011 (E) Automatic rail-weighbridges.

B2: SCL-1 D Table 3, Parameters for Accuracy Classes

Item under Consideration:
Amend NIST Handbook 44, Scales Code as follows:

Table 3. Parameters for Accuracy Classes			
Class	***Value of the Verification Scale Division (d or e[1])***	***Number of Scale[4] Divisions (n)***	
		Minimum	***Maximum***
SI Units			
I	*equal to or greater than 1 mg*	*50 000*	*--*
II	*1 to 50 mg, inclusive*	*100*	*100 000*
	equal to or greater than 100 mg	*5 000*	*100 000*
III[2,5]	*0.1 to 2 g, inclusive*	*100*	*10 000*
	equal to or greater than 5 g	*500*	*10 000*
III L[3]	*equal to or greater than 2 kg*	*2 000*	*10 000*
IIII	*equal to or greater than 5 g*	*100*	*1 200*
U.S. Customary Units			
III[5]	*0.0002 lb to 0.005 lb, inclusive*	*100*	*10 000*
	0.005 oz to 0.125 oz, inclusive	*100*	*10 000*
	equal to or greater than 0.01 lb	*500*	*10 000*
	equal to or greater than 0.25 oz	*500*	*10 000*
III L[3]	*equal to or greater than 5 lb*	*2 000*	*10 000*
IIII	*greater than 0.01 lb*	*100*	*1 200*
	greater than 0.25 oz	*100*	*1 200*

[1] *For Class I and II devices equipped with auxiliary reading means (i.e., a rider, a vernier, or a least significant decimal differentiated by size, shape, or color), the value of the verification scale division "e" is the value of the scale division immediately preceding the auxiliary means.*

[2] *A Class III scale marked "For prescription weighing only" may have a verification scale division (e) not less than 0.01 g.*

(Added 1986) (Amended 2003)

[3] *The value of a scale division for crane and hopper (other than grain hopper* **<u>and coupled-in-motion railroad weighing systems (not used for static reference weighing</u>** *scales shall be not less than 0.2 kg (0.5 lb). The minimum number of scale divisions shall be not less than 1000.*

[4] *On a multiple range or multi-interval scale, the number of divisions for each range independently shall not exceed the maximum specified for the accuracy class. The number of scale divisions, n, for each weighing range is determined by dividing the scale capacity for each range by the verification scale division, e, for each range. On a scale system with multiple load-receiving elements and multiple indications, each element considered shall not independently exceed the maximum specified for the accuracy class. If the system has a summing indicator the* n_{max} *for the summed indication shall not exceed the maximum specified for the accuracy class.*

(Added 1997)

[5] *The minimum number of scale divisions for a Class III Hopper Scale used for weighing grain shall be 2000.*)

[*Nonretroactive as of January 1, 1986*]

(Amended 1986, 1987, 1997, 1998, 1999, 2003, ~~**and**~~ 2004 **<u>and 20XX</u>**)

B2: SCL-2 D T.N.3.6. Coupled-in-Motion Railroad Weighing Systems

Item under Consideration:
Amend NIST Handbook 44, Scales Code as follows:

T.N.3.6. Coupled-In-Motion Railroad Weighing Systems. ~~**– The maintenance and acceptance tolerance values for the group of weight values appropriate to the application must satisfy the following conditions:**~~

~~**T.N.3.6.1. – For any group of weight values, the difference in the sum of the individual in-motion car weights of the group as compared to the sum of the individual static weights shall not exceed 0.2 %.**~~

~~**T.N.3.6.2. – If a weighing system is used to weigh trains of five or more cars, and if the individual car weights are used, any single weight value within the group must meet the following criteria:**~~

~~**(a) no single error may exceed three times the static maintenance tolerance;**~~

~~**(b) not more than 5 % of the errors may exceed two times the static maintenance tolerance; and**~~

~~**(c) not more than 35 % of the errors may exceed the static maintenance tolerance.**~~

~~**(Amended 1990 and 1992)**~~

~~**T.N.3.6.3. – For any group of weight values wherein the sole purpose is to determine the sum of the group, T.N.3.6.1. alone applies.**~~

~~**(Amended 1990)**~~

~~**T.N.3.6.4. – For a weighing system used to weigh trains of less than five cars, no single car weight within the group may exceed the static maintenance tolerance.**~~

~~**(Amended 1990 and 1992)**~~

T.N.3.6.1. Accuracy Classes - Systems are divided into four accuracy classes as follows:

0.2 0.5 1 2

A system may be in a different accuracy class for wagon weighing than that for train weighing.

T.N.3.6.2. Tolerance Values – The acceptance and maintenance tolerance values shall be as specified in Table T.N.3.6 below:

Accuracy Class	Table T.N.3.6. Percentage of mass of single wagon or train as appropriate	
	Acceptance Tolerance	Maintenance Tolerance
0.2	0.10%	0.20%
0.5	0.25%	0.50%
1	0.50%	1.00%
2	1.00%	2.00%

T.N.3.6.3. Wagon Weighing – The tolerance value for uncoupled or coupled wagon weighing shall be one of the following values, whichever is greater:

a) **the value calculated according to the appropriate accuracy class in Table T.N.3.6., rounded to the nearest scale interval;**

b) **<u>the value calculated according to the appropriate accuracy class in Table T.N.3.6., rounded to the nearest scale interval for the mass of a single wagon equal to 35 % of the maximum wagon mass (as inscribed on the descriptive markings); or</u>**

c) **<u>1 d.</u>**

<u>On initial verification of an instrument weighing coupled wagons, the errors of not more than 10 % of the weighing results taken from one or more passes of the test train may exceed the appropriate tolerance value given in Table T.N.3.6.but shall not exceed two times that value.</u>

<u>T.N.3.6.4. Train Weighing – The tolerance value for train weighing shall be one of the following values, whichever is greater:</u>

a) **<u>the value calculated according to the appropriate accuracy class in Table T.N.3.6., rounded to the nearest scale interval;</u>**

b) **<u>the value calculated according to the appropriate accuracy class in Table T.N.3.6., for the mass of a single wagon equal to 35 % of the maximum wagon mass (as inscribed on the descriptive markings) multiplied by the number of reference wagons in the train (not exceeding 10 wagons) and rounded to the nearest scale interval, or</u>**

c) **<u>1 d for each wagon in the train but not exceeding 10 d.</u>**

Background/Discussion:

Note: Agenda Items SCL-1 and SCL-2 of this block appeared on the Committee's 2017 agenda as Items 3200-4 and 3200-8, respectively.

The content of NIST Handbook 44 has been driven by the ongoing development of weighing devices. This is quite apparent when viewed for the purpose of certifying in-motion rail weighing systems. These devices have been developed from static, platform-type scales that utilize one or more very accurate load cells, and the Handbook seems to assume the devices will also be used for static reference weighing.

Meridian Engineers asks that you consider their in-motion weighing rail weighing system that has been in production and development for 15 years. It already has trade approval in Australia (National Measurement Institute) and the European Union (EU) (National Measurement Regulation Office) and they are now looking to gain NTEP Certification.

The product utilizes what they refer to as bolt-on transducers, which make the rail a pseudo load cell. They are not designed to be used as a conventional load cell that can be connected to a standard load cell indicator. They are only designed for the end application i.e., CIM train weighing. Furthermore, their product is not attempting to perform static reference weighing.

Because they bolt their transducers onto existing railway line, they cannot change its sectional properties to increase performance or accuracy. Also, their transducers do not carry zero-shift compensation because the overall system is constantly digitally zeroing the system typically after every 4th axle weighed. Hence, they state there has been no need to incorporate conventional zero-shift compensation into the manufacturing of their transducers.

In this application, the errors from the quality of the rolling stock, the track foundation condition, as well as how smoothly the locomotive drives across the system are significantly higher than the individual class IIIL permissible errors.

All this means the accuracy of their "load cell" would struggle to meet Class IIIL requirements as they currently stand. Yet the accuracy of their system is as good as any system designed with Class IIIL load cells for coupled in-motion weighing.

The requirement to have load cells pass IIIL accuracy requirements for CIM train weighing is not appropriate and restricts the design of the final system to more conventional platform style systems, which is detrimental to innovation. This requirement is too stringent, and they would argue that the final accuracy of the complete system should dictate how accurate the load cells need to be.

At both the 2017 NCWM Interim and Annual Meetings, the Committee granted Meridian Engineers Pty Ltd time to present slides it had developed to describe the general functionality of Meridian's CIM railroad weighing system and explain its reasons for wanting to amend HB 44 as proposed by the two items in this block. Mr. Anthony Pruiti (Meridian Engineers Pty Ltd) commented during his presentation at the Annual Meeting that the changes, if adopted, would align the performance requirements corresponding to CIM railroad weighing systems in HB 44 with those in OIML R 106 Automatic rail-weighbridges. OIML R106 provides multiple accuracy classes for CIM railroad weighing, whereas, HB 44 currently provides only a single accuracy class.

OWM noted that, while establishing different accuracy classes for weighing devices would not be unprecedented, if this were done specifically for CIM railroad weighing systems as proposed, each accuracy class would also need to define the application of the weighing systems assigned that accuracy class.

Representatives from the AAR and SMA commented that their associations take no position on these items. The representative from the AAR stated the AAR planned to review and analyze the test data that had been collected on the Meridian systems.

At the 2017 NCWM Interim and Annual Meetings, respectively, the Committee agreed to assign and maintain a "Developing" status on this block of items. Refer to the Committee's 2017 Final Report for additional details and to view other comments received by the Committee on this block of items.

At the 2018 NCWM Annual Meeting, the Committee did not take comments during open hearings on Developing items except to grant the submitter of a Developing item (or block of Developing items) an opportunity to provide an update on the progress made to further develop the item(s) since the 2018 NCWM Interim Meeting. Mr. Richard Suiter (Richard Suiter Consulting), serving as consultant to Meridian Engineers Pty Ltd., provided an update to the Committee on this block of items. He reported Meridian is still working on these items in hopes of having a proposal developed for consideration at the 2019 NCWM Interim Meeting.

In written comments to the Committee the SMA recommended the withdrawal of these items. The current standards have been in effect for years, there are a number of devices that comply with the current standards, and the SMA does not feel lowering the standard is in the best interest of the weights and measures community. In addition, the SMA feels that adding additional classes with larger tolerances would cause confusion in the marketplace.

OWM provided the following written recommendations and comments to this block of items as feedback to the submitter and as part of its analysis of the S&T Committee's 2018 agenda items, including a reiteration of comments received at the 2018 NCWM Interim Meeting:

> This item remains in a "Developing" status having first been submitted by Meridian Engineers Pty Ltd. in 2017. OWM is not aware of any changes that have been made to the proposal from the time it was first introduced. OWM looks forward to an update by the submitter of this item on the progress of its development, particularly how OWM's written comments and recommendations pertaining to this item (which were circulated at the 2018 NCWM Interim Meeting) are being addressed.

The following written OWM recommendations and comments for this item were provided to the Committee and NCWM membership at the NCWM's 2018 Interim Meeting:

> This item proposes four different accuracy classes for CIM railroad weighing systems. This presents the need for someone to have to choose a weighing system that fits their intended application, yet, the proposal doesn't provide any guidance on how this selection is to be made nor does it specify who decides the appropriate accuracy class. This approach of specifying different accuracy classes in HB 44 for the same type of scale to be used in, perhaps, the same or similar applications deviates significantly from how commercial and law-enforcement scales in the

U.S. are typically selected today. Without any guidance concerning acceptable and unacceptable uses of the different accuracy classes specified, this proposal presents a conflict for those having to decide an appropriate weighing system for a given installation.

OWM would need additional supporting data and information from the submitter of this item to be able to offer constructive feedback on the two proposals in this group, including, as a start,

- Clarification on whether the proposal is intended to include "uncoupled-in-motion railroad weighing systems." Although the title of proposed paragraph T.N.3.6. is "Coupled-In-Motion Railroad Weighing Systems," proposed new paragraph T.N.3.6.3. Wagon Weighing references both uncoupled and coupled "wagon" weighing. If the proposal is to include uncoupled wagon weighing, the title of T.N.3.6. would need to be changed. If not, then the reference to "uncoupled wagon weighing" in T.N.3.6.3. would need to be deleted. OWM notes that if the proposal is intended to apply to uncoupled-in-motion railroad systems, the tolerances specified in the proposal far exceed the current NIST HB 44 tolerances specified in paragraph T.N.3.7. for this same application, which requires every weighment error to be within the static maintenance tolerance.

- Results of comparison tests (using reference cars weighed as a single draft on an accurate static railroad track scale) that provide true indication of the accuracy of the Meridian system.

- The rationale for the changes proposed to footnote 3 of Table 3.

- Clarification of how the tolerance values in proposed Table T.N.3.6. are calculated for both wagon weighing and train weighing on both initial and subsequent verifications based on the criteria specified in proposed paragraph T.N.3.6.3. and T.N.3.6.4. Perhaps an example of the tolerance calculations for both wagon weighing, and train weighing would be helpful to clarify the application of these tolerances.

- A list of the different qualifying applications in which the proposed four accuracy classes of a coupled-in-motion railroad weighing system could be used.

While OWM is very supportive of wanting to harmonize U.S. and international standards when it makes sense to do so, we view this proposal as an attempt to increase the allowable tolerance on individual railcars weighed coupled-in-motion to pave the way for the use of railroad weighing systems installed on continuous rail. We question the reasonableness of increasing current HB 44 tolerances to allow for the use of less accurate commercial equipment given that existing commercial equipment is able to perform to within the current tolerances specified.

The Committee agreed to carryover this block of Items on its 2019 agenda to provide the submitter additional time to develop the items.

Regional Association Comments:
The WWMA, at its fall 2017 Annual Meeting, recommended withdrawal of this item because the changes are so substantial and the effect on other areas of the code and devices that are currently in use, that more research is needed to help the WWMA understand why the current code needs this change.

During the Committee's open hearings at SWMA's fall 2017 Annual Meeting, Mr. Russ Vires, (Mettler-Toledo, LLC) speaking on behalf of SMA, stated SMA opposes both these items. Mr. Vires noted the proposed changes seem rather simple, but would have considerable impact, including changes to the effective number of division and increasing the tolerance. Mr. Richard Suiter (Richard Suiter Consulting), speaking as a representative of the submitter (Meridian Engineers), gave a presentation on the proposal and noted that a key goal is to obtain harmonization with international requirements. Mr. Suiter noted that the effective error resulting from the proposed increase in tolerance is minimized by the large size of the overall load. The idea of establishing tolerances based on commodities would be a very different approach from our current system, but it may be something that needs to be considered in the future. Others expressed concerns over that philosophy. Given the diverse opinions on this issue, the SWMA recommended this item remain Developing.

At the CWMA's fall 2017 Interim and spring 2018 Annual Meetings, the CWMA recommended further development of these items. The CWMA's S&T Committee reported it believes the product (Meridian's CIM Railroad Weighing System) has merit, but it should be treated the same as similar devices which are NTEP certified and currently in use. The Committee also believes the current language of this proposal would show favoritism to devices which may not be able to pass NTEP evaluation. The SMA opposed item 3200-4 because it believes this is an unnecessary change to the code. On behalf of Meridian, Mr. Suiter recommended the item remain Developing.

NEWMA recommended further development of this group of items at its fall 2017 Interim Meeting. At its spring 2018 Annual Meeting, the SMA recommended withdrawal of these items. NEWMA does not wish to lower standards or add classes with lower tolerances which may cause confusion. Another comment was that current accuracy classes could be too high. While NIST typically supports aligning standards, they generally concur with the SMA. NEWMA agreed to recommend these items be Withdrawn.

Additional letters, presentations, and data may have been submitted for consideration with this item. Please refer to **www.ncwm.com/interim-archive** to review these documents.

BLOCK 3 ITEMS (B3) SUMMING OF INDIVIDUAL WEIGHING/MEASURING ELEMENTS

Source:
Ross Andersen, New York Retired (2017)

Purpose:
Address application of the code requirements across multiple devices.

B3: SCL-3 W Table 3, Parameters for Accuracy Classes

(This item was withdrawn)

Item under Consideration:

Amend NIST Handbook 44, Scales Code as follows:

Table 3: Parameters for Accuracy Classes

Class	***Value of the Verification Scale Division (d or e[1])***	***Number of Scale[4] Divisions (n)***	
		Minimum	***Maximum***
	SI Units		
I	*equal to or greater than 1 mg*	*50 000*	--
II	*1 to 50 mg, inclusive*	*100*	*100 000*
	equal to or greater than 100 mg	*5 000*	*100 000*
III[2,5]	*0.1 to 2 g, inclusive*	*100*	*10 000*
	equal to or greater than 5 g	*500*	*10 000*
III L[3]	*equal to or greater than 2 kg*	*2 000*	*10 000*
IIII	*equal to or greater than 5 g*	*100*	*1 200*
	U.S. Customary Units		
III[5]	*0.0002 lb to 0.005 lb, inclusive*	*100*	*10 000*
	0.005 oz to 0.125 oz, inclusive	*100*	*10 000*
	equal to or greater than 0.01 lb	*500*	*10 000*
	equal to or greater than 0.25 oz	*500*	*10 000*
III L[3]	*equal to or greater than 5 lb*	*2 000*	*10 000*
IIII	*greater than 0.01 lb*	*100*	*1 200*
	greater than 0.25 oz	*100*	*1 200*

[1] *For Class I and II devices equipped with auxiliary reading means (i.e., a rider, a vernier, or a least significant decimal differentiated by size, shape, or color), the value of the verification scale division "e" is the value of the scale division immediately preceding the auxiliary means.*

[2] *A Class III scale marked "For prescription weighing only" may have a verification scale division (e) not less than 0.01 g.*

(Added 1986) (Amended 2003)

[3] *The value of a scale division for crane and hopper (other than grain hopper scales shall be not less than 0.2 kg (0.5 lb). The minimum number of scale divisions shall be not less than 1000.*

[4] *On a multiple range or multi-interval scale, the number of divisions for each range independently shall not exceed the maximum specified for the accuracy class. The number of scale divisions, n, for each weighing range is determined by dividing the scale capacity for each range by the verification scale division, e, for each range.* ~~***On a scale system with multiple load-receiving elements and multiple indications, each element considered shall not independently exceed the maximum specified for the accuracy class. If the system has a summing indicator the*** n_{max} ***for the summed indication shall not exceed the maximum specified for the accuracy class.***~~

(Added 1997, **Amended 20XX**)

[5] *The minimum number of scale divisions for a Class III Hopper Scale used for weighing grain shall be 2000.*)

[*Nonretroactive as of January 1, 1986*]

(Amended 1986, 1987, 1997, 1998, 1999, 2003, and 2004)

B3: OTH-1 W Appendix A – Fundamental Considerations: Section 4.4. General Considerations

(This item was Withdrawn.)

Item under Consideration:
Amend NIST Handbook 44, Appendix A – Fundamental Considerations as follows:

4.4. General Considerations. –

The simpler the commercial device, the fewer are the specification requirements affecting it, and the more easily and quickly can adequate inspection be made. As mechanical complexity increases, however, inspection becomes increasingly important and more time consuming, because the opportunities for the existence of faulty conditions are multiplied. It is on the relatively complex device, too, that the official must be on the alert to discover any modification that may have been made by an operator that might adversely affect the proper functioning of the device. **Code requirements in the Handbook are applied only to a single device or system, unless specifically stated in the code. An electronic sum of measured values from multiple devices is not subject to code requirements, except that it be mathematically correct, i.e. add up to the proper sum - See General Code G-S.5.2.2.(e).**

It is essential for the officials to familiarize themselves with the design and operating characteristics of the devices that he inspects and tests. Such knowledge can be obtained from the catalogs and advertising literature of device manufacturers, from trained service persons and plant engineers, from observation of the operations performed by service persons when reconditioning equipment in the field, and from a study of the devices themselves.

Inspection should include any auxiliary equipment and general conditions external to the device that may affect its performance characteristics. In order to prolong the life of the equipment and forestall rejection, inspection should also include observation of the general maintenance of the device and of the proper functioning of all required elements. The official should look for worn or weakened mechanical parts, leaks in volumetric equipment, or elements in need of cleaning.

(Amended 20XX)

Background/Discussion:

Note: Agenda Items SCL-3 and OTH-1 of this block appeared on the Committee's 2017 agenda as Agenda Items 3200-5 and 3600-2, respectively.

The submitter modified the proposal to amend Appendix A after the 2017 WWMA meeting. The item under consideration now represents the revised version. The original proposal and rationale that was presented at WWMA was as follows:

4.4. General Considerations. – Code requirements are applied only to a single device or system, unless specifically stated in the code. The official may encounter equipment where the digital indications from more than one device are electronically summed. This may be done in multiple ways. Each device may have its own indicating element and the sum is indicated on a separate, associated indicator which is interfaced directly with each device (i.e. a computer or console via cable or even Bluetooth wireless communication). The indicating elements of the individual devices may be enclosed in a single housing, with separate indicators for each device and a separate indicator for the electronic sum. An electronic sum of measured values from multiple devices is not subject to code requirements, except that it be mathematically correct, i.e. add up to the proper sum - See General Code G-S.5.2.2.(e).

The simpler the commercial device, the fewer are the specification requirements affecting it, and the more easily and quickly can adequate inspection be made. As mechanical complexity increases, however, inspection becomes increasingly important and more time consuming, because the opportunities for the existence of faulty conditions are multiplied. It is on the relatively complex device, too, that the official must be on the alert to discover any modification that may have been made by an operator that might adversely affect the proper functioning of the device.

It is essential for officials to familiarize themselves with the design and operating characteristics of the devices that they inspect and test. Such knowledge can be obtained from the catalogs and advertising literature of device manufacturers; trained service persons and plant engineers; observation of the operations performed by service persons when reconditioning equipment in the field; and study of the devices themselves.

Inspection should include any auxiliary equipment and general conditions external to the device that may affect its performance characteristics. In order to prolong the life of the equipment and forestall rejection, inspection should also include observation of the general maintenance of the device and of the proper functioning of all required elements. The official should look for worn or weakened mechanical parts, leaks in volumetric equipment, or elements in need of cleaning.

The submitter's original proposal (dated April 18, 2016) provided the following justification for the changes proposed by this item:

The NCWM made a mistake in 1990 in interpreting how we apply the code requirements to the three-platform, three-indicator truck scale with a fourth summed indication. In any suggestion that a code should be changed or reinterpreted, there is an unstated requirement that there must be some conflict that needs resolution. Often the difficult part is in just identifying the conflict or in finding the right question to expose the conflict to others and, in doing so, possibly point to the resolution. Some might think there is no conflict and there is no issue, but I must disagree.

What stands out on this issue to me is the huge divide between the public sector and private sector on this issue. It was black and white in 1989; good guys versus the bad guys. The public sector, me included, saw the issue one way while the scale industry almost unilaterally saw it differently. As I think back over my career, I find it hard to find many issues where consensus between the two sides eluded the NCWM as it did for this issue. In my experience, the scale industry works toward consensus as earnestly as the public sector. If there is no consensus here, this should bother us all and encourage us to try to understand why.

If we ask the question on our current issue, as Henry Oppermann has, it goes like this: How do we apply the Scales Code requirements to a three-platform scale with three independent weight indications and a fourth indication of the sum of the three independent platforms? His answer follows his logic of the "duck test." Quoting him, "if a scale looks like truck scale, operates like a truck scale, and weights trucks, then it is a truck scale."

It is important to note that a parallel issue was on the 2016 S&T agenda dealing with the v_{min} requirement for these three-platform scales with three independent indicators. However, in dealing with this small part of the larger issue, the Committee has chosen to ignore the larger issue for now. In my testimony at the 2016 Interim Meeting, I pointed out that the v_{min} change would result in a mixed state of being. Part of our interpretation would treat the three scales as three (i.e., for v_{min}), but treat them as one for all other requirements. Does this make sense?

I see an immediate problem here, as Henry's quote is based on thinking from 1989, and I'll suggest much earlier, pre-1986 to be exact. We can see this in Tables 7b. and 7a. in the Scales Code. These tables deal with selection requirements for unmarked scales and marked scales. Table 7b. reflects that pre-1986 thought process where the application of the unmarked device determined what technical and performance requirements would apply. This is the model implied in Henry's comment and in the thought process we see from the S&T Committee as it wrestled with this issue in 1990. Quoting from page 157 of the 1990 S&T final Report: "The classification of a scale or weighing system into an accuracy class should be based upon its application and method of use, not on the design of the device." In the same paragraph the report also notes, "The significance of this interpretation is that not only must each independent weighing device meet the requirements of Handbook 44, but the entire weighing system must meet all requirements that would apply <u>if the device were a single scale</u>." [Emphasis added by the submitter] This was voted on and approved by the public-sector voters of the NCWM with strong (non-voting) opposition from the scale industry.

Looking at that last statement in the S&T report today, does it even make sense? Table 7a. made a radical departure from the pre-1986 way of thinking. Under the "New" Scales Code which took effect January 1, 1986, the technical and performance requirements were determined by the class designation that was chosen and marked on the device by the manufacturer. In the wording of the table, it is a typical application of the class. Thus, the requirements apply based on the class designation as marked by the manufacturer and the device is adapted to the application. To me, this contradicts the S&T conclusions in 1990.

I'm suggesting that a "duck test" is not valid for marked devices. For example, there is no single set of requirements for a marked truck scale. By this I mean one can use a class III or a class IIIL scale to weigh trucks and the requirements are therefore very different. This was impossible to imagine prior to 1986 under the "Old" Scales Code. It is the manufacturer, in the design and production phases, who determines and marks the class. It is the marked class that determines which technical requirements will be applied to the device, and this is done before it leaves the plant. The code recognizes that the manufacturer has no means to limit the application once the purchaser buys the device. Whether a device is suitable is a separate question and has a separate requirement, i.e., G-UR.1. Suitability of Equipment.

I believe the "duck test" is not valid for the entire Handbook. For me, the critical issue we have to address is how to apply code requirements in general. The simple direct answer is, we apply code requirements to <u>a</u> device. That is how the requirements are written, in the singular. Why is this singularity important? The answer lies in unstated general principles in Handbook 44 which we can elicit by asking, "How do we measure quantities of things in commerce, generally?" By generally, I mean across all codes. My answer is that the codes clearly allow multiple solutions to that question. I'll state this more specifically:

A commodity exchanged in commerce may be measured as:

A. a single draft measured using a single measuring instrument;

B. the sum of measurements of sub-parts of the whole using multiple drafts on a single measuring instrument; or

C. the sum of measurements of sub-parts of the whole using multiple drafts of multiple measuring instruments.

It must be noted that the instrument used in any of the options A through C must be suitable for service when measuring the whole or the sub-part in conformance with G-UR.1. For the purposes of this discussion we will stipulate that all measuring instruments involved are suitable for service, whether measuring the whole or the sub-part. For example, all weighments are stipulated to be greater than the recommended minimum load in Table 8 or liquid quantities in conformance with G-UR.1.3.

A couple of examples might help. I don't think I need to illustrate option A, as it is the most common solution. Option B can be seen with an Automatic Bulk Weighing system which operates by summing multiple drafts weighed on the same scale to provide a total weight of the whole commodity. But I could also do option B using VTM's. I could make multiple deliveries from a single VTM unit to fill a large customer order; i.e., larger than the tank capacity of the single VTM. Alternatively, I could fill that order using drafts from multiple VTM units, option C.

Our assumption in accepting each of these options is that the <u>sum of measurements from multiple compliant instruments is *de facto* compliant.</u> In fact, the reason we use multiple drafts in the first place is that the total will probably exceed our ability to verify the quantity of the whole, even if we wanted to! Going back to our examples, how could we verify, after the fact, that the 1,000 tons of grain loaded on a barge from an ABWS system with a 50,000-lb capacity scale is accurate? That's at least 40 drafts.

What becomes very clear to me in the general case is that the technical and performance requirements are applied to the individual device without regard to the summed total. It seems this summed total has always been the crux of the issue. Does this summed indication now link the three independent platforms with their independent indication in a way that makes them one device for legal purposes? This is what the S&T Committee decided in 1990. Some would continue to say yes, and some would say no. However, there is the law to consider. By law, I mean the general rules of construction of legal requirements. In construction, we must not be arbitrary and capricious. I believe those that say the three scales are one scale are being arbitrary and capricious.

To see how this is so, consider what UR.3.3. Single-Draft Weighing means. Below is the current HB 44 text.

> **UR.3.3. Single-Draft Vehicle Weighing.** – A vehicle or a coupled-vehicle combination shall be commercially weighed on a vehicle scale only as a single draft. That is, the total weight of such a vehicle or combination shall not be determined by adding together the results obtained by separately and not simultaneously weighing each end of such vehicle or individual elements of such coupled combination. However, the weight of:
>
> (a) a coupled combination may be determined by uncoupling the various elements (tractor, semitrailer, trailer), weighing each unit separately as a single draft, and adding together the results; or
>
> (b) a vehicle or coupled-vehicle combination may be determined by adding together the weights obtained while all individual elements are resting simultaneously on more than one scale platform.

The first sentence of UR.3.3. makes it clear that this is not a general provision since it limits the scope of the requirement to "a vehicle or a coupled-vehicle combination." It now goes on to say that any entity fitting one of those two descriptions shall be weighed as a single draft. Note that this is option A from the general case above. The paragraph goes on to provide more explanation of what single-draft means.

Then we come to a "However," indicating there are viable alternatives to the single-draft requirement. Alternative (a) allows the coupled combination to be divided into sub-parts that are weighed separately and the weight of the coupled combination is found by summing the individual weights of the sub-parts. Alternative (b) says that a vehicle or a coupled combination may be suspended simultaneously on more than one scale and the weight is found by summing the indications of the multiple scales.

We might think that alternative (a) is option B from the general case, and alternative (b) is option C. However, closer reading will show that is not the case. Look carefully at the wording of alternatives (a) and (b). You cannot equate (a) with option B since (a) does not limit you to a single scale. You might assume that the multiple parts would be weighed on the same scale, but the code does not stipulate that. To do that the code would have to add the words, "on the same scale," i.e. …. weighing each unit separately <u>on the same scale</u>, and adding together the results;" What I'm pointing out is that (a) as it is now written allows either general option B or C. By this I am considering the case where there are multiple scales available at the site. Each of those scales might have a capacity of 200,000 x 20 lb. For example, think about one of those three component trucks (tractor, trailer, and pup). Alternative (a) allows you to uncouple and weigh the three sub-parts on three scales, two scales, or one scale in full compliance with the code.

Now it becomes clear that UR.3.3. is addressing the real issue with weighing large vehicles and coupled-vehicle combinations, and that is shifting loads and coupler interactions. In alternative (a) you eliminate both interferences by isolating each part on its own scale. In alternative (b) by supporting the vehicle or combination on multiple scales, any shift in the load or coupler interaction cancels out. If load shift or couple interference reduces the weight on one platform, it increases it on another. Of critical importance, the three-platform scale, that is the focus of this discussion, is an application of (b) where the load is supported simultaneously on more than one platform and the individual indications of the three scales are summed to get a total. There is no other way to describe what is happening since the total indication is, in fact, a sum of the weights from the three separate platforms. Also, of critical importance, there should be no expectation whatsoever that the sum valued obtained in alternative (a) will be <u>identical</u> to alternative (b).

However, getting back to the question about three scales or one, it should now be clear that the Handbook clearly allows summed indications from multiple devices using options B or C. If the S&T statement is correct, then the code requirements must be applied across two scales or three scales in the example of multiple scales at a site. Thus, the three, one-hundred-ton scales have a combined 30,000 divisions according to that interpretation. This would virtually preclude having multiple scales at the same site as they might be used to weight a single coupled-vehicle combination in pieces. Even going to 50 lb divisions still puts them out of compliance. Also, you have to consider the shift test requirements, which now require agreement of sections across all three scales!

Finally, we have to consider other cases of three independent scale platforms configured to weigh trucks. In case one, each platform has a stand-alone independent indicator and the three indications are manually summed by the operator. In case two, each platform has an individual indicator, but all three indicators are housed in a single enclosure. Again, the summing is done manually by the operator. In both cases the three independent instruments remain independent under the 1990 decision. This is what I mean by arbitrary and capricious.

Now, suppose I can weigh a coupled-vehicle combination on three platforms with three separate indicators and manually add the indications to obtain a total weight for the combination. As I understand the 1990 decision, those three scales do not have to meet requirements like the number of scale divisions extended across all three scales. That extension only applies it there is a single weight display for the three scale indications and a fourth electronic indication for the sum. The results obtained are absolutely identical in function (adding manually on paper or having the system add them up) yet you are applying different requirements to the three scales depending on whether you are doing it manually or electronically. Isn't that being blatantly arbitrary and capricious?

Move over to the VTM example, and the three VTM units used to fill that order; must those three meters be treated as one meter? Think about repeatability tests. It doesn't make sense for scales, nor does it make sense for any of the other codes. Thus, I argue that options B and C allow the summing of multiple devices without forcing them to be considered one instrument for applying code requirements. I believe the Handbook needs to say that explicitly to avoid confusion.

I offer one additional item of support. I found reference that this issue has been raised internationally. Sections of the 2009 WELMEC guide to Non-Automatic Weighing Instruments addresses this issue quite clearly (see pertinent sections on the final pages of WELMEC document). Point 3.1.16. in the Guide addresses the same issues as UR.3.3. where multiple platforms are used. The applications coincide with those I expressed in this discussion paper. Also, I believe point 3.1.54. addresses the use of multiple axle-load scales to weigh a vehicle. It also supports the conclusion that the individual axle-load scales do not become a single instrument for compliance purposes. In extension, if 3.1.54. does not apply MPE (tolerances) to the summed indication, it also does not extend other technical requirements such as v_{min} [which the NCWM has addressed], n_{max}, shift test, etc.

The Fundamental Considerations change is necessary to spell out clearly that code requirements do not extend across multiple devices unless specifically stated. A good example is the application of the code to wheel-load weighers designated as and used in pairs. For those scales designated as pairs, many authorities apply the tolerances only to the combined indication of the pair. None of the other requirements applicable to the wheel-load weigher are affected by this exception. For example, the combined number of divisions for the pair is not limited to 1 200 as in Table 3. Other requirements like identification markings, rules for indicators, zero load adjustments, etc., remain applicable only to the individual wheel-load weigher and not to the pair.

The addition to G-S.5.2.2. is necessary since you can't write requirements into the Fundamental Considerations. That section is there to help understand how to apply what is written in the codes. You must have a specification that the electronic sum be mathematically correct to reference if there is non-compliance. That is: readings from three scales of 107, 206, and 98 must result in an electronic sum of 411.

Note 4 in Table 3 has to be changed, since the last two sentences address these instances of multiple independent scales and reflect the 1990 decision. The removal of the last sentence removes the summed indicator from consideration under the classification system as discussed above, since the summed indication is not a directly measured quantity and is not subject to class requirements. The summed indication is also not subject to requirements for n_{max}, tolerances, etc. When this last sentence is removed, it makes the next to last sentence unnecessary. Since each of the independent scales are already covered under the general provisions of the Table.

There is a small side issue regarding multiple devices using option C where the division size is not the same for all the devices. The general principle (i.e., that summing the indications from compliant devices is a valid way to measure a commodity) does not necessarily require that division sizes of the individual devices be identical. Note that you might want to apply UR.1.3. to printed records from the three scales. However, the new Fundamental Considerations paragraph exempts the summed indication since code requirements do not apply to the summed indication except the mathematical correctness. Also, the summed indication is a sum not a representation of a scale division. It is just a sum of the values obtained from the individual compliant devices. The individual weights are also required to be shown on any record of the transaction. While the different division sizes may offend our sensibilities a little bit, on what objective basis can we say it violates the general principle? That is, the sum of multiple compliant measurements is also *de facto* compliant. It is this compilation of original sources for the sum and the sum that provides the transparency for the transaction. Note the WELMEC reference indicates this is the position taken by many internationally.

I can think of another possible situation in the case of multiple ABWS systems. Suppose you are loading to a single barge from two sources where the two ABWS scales have different division sizes. The scale controller interfaced to the two scales now can print each of the weighments from each of the two scales and a single total for the entire transaction. The sum need only be mathematically correct since it is a mathematical sum of independent, compliant weighments.

From May 2009 version of WELMEC Directive 90/384/EEC: Common Application Non-Automatic Weighing Instruments (available at **www.welmec.org/latest/guides/**)

3.1.2 Calculated weight (Meeting 10, Decision 10)

Where the indication represents an actual determination of the weight then the indication must respect the error allowance and be presented in the correct format.

When gross, net and tare are printed together, weight may be calculated from two actual determinations of weight. In the case of a multi-interval instrument it would be allowed to print a calculated value with the least significant digit which need not be rounded to the relevant scale interval.

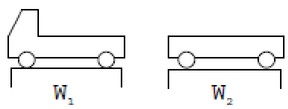
Any printout of the calculated weight values should be identified as calculated weight values.

(See also Sections 3.1.16 and 3.1.54)

3.1.16 Combined and multi-plate weighbridges (Meeting 14, Point 4, Meeting 15, Point 2 and Meeting 18, Point 9)

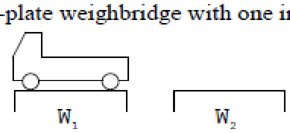
This concerns weight obtained by using adjacent weighbridges. Acceptable solutions, with examples, are shown below:

Two weighbridges, each with its own indicator:

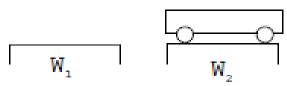


W_1 = 30 t x 10 kg
W_2 = 30 t x 10 kg
(Two indicators; simultaneous indication necessary)
Calculated weight 60 t x 10 kg
(mpe does not apply to calculated weight)

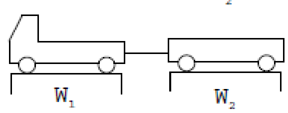
Multi-plate weighbridge with one indicator:



W_1 = 30 t x 10 kg



W_2 = 30 t x 10 kg



W_{1+2} = 60 t x 20 kg

W_{1+2} is a weighing range (Compatibility of modules and mpe must be satisfied for it)

(See also Sections 3.1.2 and 3.1.54)

3.1.54 Vehicle weighing by summation of individual wheel load NAWIs ("axle weighers") (Meeting 25, Point 9)

If the total weight of a vehicle is calculated automatically by summing the individual weight values produced by individual wheel load NAWIs ("axle weighers"), the system is not to be regarded as being one single NAWI. The mpe does not apply to calculated weight.

(See also Sections 3.1.2 and 3.1.6)

3.1.6 Load cells

(Note that throughout this guide, "load cells" refers to analogue load cells rather than digital load cells unless stated otherwise.)

The submitter also provided in his original proposal an excerpt from the May 2009 version of WELMEC Directive 90/384/EEC: Common Application Non-Automatic Weighing Instruments. See the Committee's 2017 Final Report for details.

At the 2017 NCWM Interim Meeting, the Committee grouped Agenda Items 3100-1, 3200-5, and 3600-2 together and took comments on these items simultaneously because it considered them related. See Agenda Item 3100-1 for a summary of the comments received and the resulting actions taken by the Committee on these items at the 2017 NCWM Interim Meeting.

At the 2017 NCWM Annual meeting, S & T Committee Chair Dr. Matt Curran (Florida) stated the Committee would only hear comments from the submitter on Developing items at the Committee's open hearings. The Committee grouped Agenda Items 3100-1, 3200-5, and 3600-2 together because it considered them related. Mr. Ross Andersen (New York, retired) spoke on the updates to this group of items. See Agenda Item 3100-1 for a summary of the updated information provided by him. The Committee agreed to carryover this group of items on its agenda as Developing items to allow Mr. Andersen the opportunity to further develop and garner support for his proposals.

During the 2018 NCWM Interim Meeting, the Committee heard comments from Mr. Ross Andersen who provided a presentation supporting the submitted items. Mr. Andersen stated the interpretation of the NCWM S&T Committee in 1990 was wrong; a weighing device including three scales plus a totalizer is subject to the v_{min} requirements as prescribed in the Scales Code.

Mr. Russ Vires (Mettler-Toledo, LLC) representing the SMA stated that the SMA opposes this item. He stated UR.3.3. in the Scales Code allows summing of multiple devices. The General Code applies to weighing devices and a summing indicator is not a weighing device. Summing cannot comply with AZT, motion, printing, sensitivity or other requirements prescribed in the Scales Code that apply to weighing devices. He suggested a task group may be needed.

Ms. Julie Quinn (Minnesota) recommended moving the item forward as Voting item.

Mr. Henry Oppermann (Weights and Measures Consulting, LLC) strongly disagreed with the opinion that a summing indicator does not have to meet the requirements prescribed in the Scales Code for weighing devices. He further stated, if each indicator has rounding errors the errors are compounded on the three indicators and summed to one error. This error may indicate a device exceeding tolerance.

Mr. Eric Golden (Cardinal Scale) opposes this item. He stated the item needs interpretation and would support a task group. Mr. Dmitri Karimov (Liquid Controls) stated this may be a scale issue but is concerned the fundamental issues of this item may affect meters as well. He would like clarification. Mr. Richard Suiter (Richard Suiter Consulting) stated he felt like there was a problem with the argument concerning the summing of indicators. He would support a work group.

During the Committee work session, the members agreed to withdraw the items B3: SCL-3 and B3: OTH-1 based on comments heard during open hearings. Although there was support for a work group to continue to develop the items, it was agreed the items did not have support to move forward.

Regional Association Comments:
At the fall 2017 WWMA Annual Meeting, the WWMA's S&T Committee grouped this item with 3200-5 and took comments on both at the same time. The WWMA S&T Committee concluded that each independent scale in a system with multiple scales, and a summing indicator as well as the combined scale system must meet the requirements of HB 44. The WWMA recommended both items be withdrawn.

At the fall 2017 SWMA Annual Meeting, the SWMA's S&T Committee viewed a recorded presentation (with accompanying PowerPoint slides) from the submitter. There were multiple comments received during open hearings indicating a lack of understanding of what the proposal was trying to accomplish. Most states report treating this as three scales when the systems are tested. The SWMA S&T Committee agreed that each independent scale in a system with multiple scales and a summing indicator as well as the combined scale system must meet the requirements of handbook 44. The SWMA recommended all items in this "block" be Withdrawn.

A PowerPoint presentation was submitted to the CWMA's S&T Committee by Mr. Andersen for viewing at the CWMA's fall 2017 Interim Meeting. The SMA opposed this item, because it would restrict the use of multiple scales operating using internal resolution to create an additional scale that provides the total weight value. This proposal would not address the total scope of the changes necessary to eliminate ambiguity in the code. Rice Lake Weighing believes the presentation was incorrect on several points. Changes in this area would require a more comprehensive approach. The CWMA S&T Committee agrees with the submitter that HB 44 is flawed and feels this item needs to be further developed. The CWMA recommended that this item be a Developing item.

This item was considered as part of Batch 1 including items 3100-1, 3200-5, and 3600-2 at NEWMA's fall 2017 Interim Meeting. Mr. Andersen gave a presentation on the items. Mr. Eric Golden (Cardinal Scale Manufacturing) speaking on behalf of the SMA, commented that the SMA opposed the items and recommended further development.

Mr. Andersen recommended and NEWMA agreed to recommend that item 3100-1 be withdrawn and that items 3200-5 and 3600-2 be moved forward as Developing items.

Additional letters, presentations, and data may have been submitted for consideration with this item. Please refer to **www.ncwm.com/interim-archive** to review these documents.

BLOCK 4 ITEMS (B4) TERMINOLOGY FOR TESTING STANDARDS

B4: SCL-4	D	N.2. Verification (Testing) Standards
B4: ABW-1	D	N.2. Verification (Testing) Standards
B4: AWS-1	D	N.1.3. Verification (Testing) Standards, N.3.1. Official Tests, UR.4. Testing Standards
B4: CLM-1	D	N.3.2. Transfer Standard Test and T.3. On Tests Using Transfer Standards
B4: CDL-1	D	N.3.2. Transfer Standard Test, T.3. On Tests Using Transfer Standards
B4: HGM-1	D	N.4.1. Master Meter (Transfer) Standard Test, T.4. Tolerance Application on Test Using Transfer Standard Test Method
B4: GMM-1	D	Air Oven Reference Method Transfer Standards, N.1.3. Meter to Like-Type Meter Method Transfer Standards and 5.56(b): N.1.1. Transfer Standards, T. Tolerances1
B4: LVS-1	D	N.2. Testing Standards
B4: OTH-2	D	Appendix A: Fundamental Considerations, 3.2. Tolerances for Standards, 3.3. Accuracy of Standards
B4: OTH-3	D	Appendix D – Definitions: fifth-wheel, official grain samples, transfer standard and Standard, Field

Source:
NIST OWM (2018)

Purpose:
To remove the current limited definition and use of the term "Transfer Standard" and eliminate terms "testing standards," "verification (testing) standards," and, instead use the term "Field Standard," consistent with its reference in HB 44, Appendix A, Fundamental Considerations and its use in several sections of HB 44. To correct the broad use of the term "Transfer Standard" and, instead replace its use with the term "Field Standard." To update all use of the term "standard" to use the term "Field Standard." To remove the current limited definition of "Transfer Standard" and instead use the term "Field Standard."

B4: SCL-4 D N.2. Verification (Testing) Standards

Item under Consideration:
Amend NIST Handbook 44, Scales Code as follows:

> N.2. ~~**Verification (Testing)**~~ **Field** Standards. – Field standard weights used in verifying weighing devices shall comply with requirements of NIST Handbook 105-Series standards (or other suitable and designated standards) or the tolerances expressed in Fundamental Considerations, paragraph 3.2. (i.e., one-third of the smallest tolerance applied).
> (Amended 1986 **and 20XX**)

B4: ABW-1 D N.2. Verification (Testing) Standards

Item under Consideration:
Amend NIST Handbook 44, Automatic Bulk Weighing Systems Code as follows:

N.2. ~~Verification (Testing)~~ Field Standards. – **Field** ~~S~~standard weights and masses used in verifying weighing devices shall comply with requirements of NIST Handbook 105-1 (Class F) or the tolerances expressed in Appendix A, Fundamental Considerations, paragraph 3.2. (i.e., one-third of the smallest tolerance applied).
(Amended 20XX)

B4: AWS-1 D N.1.3. Verification (Testing) Standards, N.3.1. Official Tests, UR.4. Testing Standards

Item under Consideration:
Amend NIST Handbook 44, Automatic Weighing Systems Code as follows:

N.1.3. ~~Verification (Testing)~~ Field Standards. – Field standard weights shall comply with requirements of NIST Handbook 105-1, "Specifications and Tolerances for Field Standard Weights (Class F)" or the tolerances expressed in Fundamental Considerations, paragraph 3.2. (i.e., one-third of the smallest tolerance applied).
(Amended 20XX)

N.3.1. Official Tests. – Officials are encouraged to periodically witness the required "in house" verification of accuracy. Officials may also conduct official tests using the on-site ~~testing~~ **field** standards or other appropriate standards belonging to the jurisdiction with statutory authority over the device or system.
(Amended 20XX)

UR.4. ~~Testing~~ Field Standards. – The user of a commercial device shall make available to the official with statutory authority over the device ~~testing~~ **field** standards that meet the tolerance expressed in Fundamental Considerations, paragraph 3.2. Tolerances for Standards (i.e., one-third of the smallest tolerance applied). The accuracy of the ~~testing~~ **field** standards shall be verified annually or on a frequency as required by the official with statutory authority and shall be traceable to the appropriate SI standard.
(Amended 20XX)

B4: CLM-1 D N.3.2. Transfer Standard Test and T.3. On Tests Using Transfer Standards

Item under Consideration:
Amend NIST Handbook 44, Cryogenic Liquid-Measuring Devices Code as follows:

N.3.2. ~~Transfer~~ Field Standard Test. – When comparing a meter with a calibrated ~~transfer~~ **field** standard, the test draft shall be equal to at least the amount delivered by the device in two minutes at its maximum discharge rate and shall in no case be less than 180 L (50 gal) or equivalent thereof. When testing uncompensated volumetric meters in a continuous recycle mode, appropriate corrections shall be applied if product conditions are abnormally affected by this test mode.
(Amended 1976 **and 20XX**)

~~**T.3. On Tests Using Transfer Standards. – To the basic tolerance values that would otherwise be applied, there shall be added an amount equal to two times the standard deviation of the applicable transfer standard when compared to a basic reference standard. (Added 1976)**~~

B4: CDL-1 D N.3.2. Transfer Standard Test, T.3. On Tests Using Transfer Standards

Item under Consideration:
Amend NIST Handbook 44, Carbon Dioxide Liquid-Measuring Devices Code as follows:

N.3.2. ~~Transfer~~ Field Standard Test. – When comparing a meter with a calibrated **~~transfer~~ field** standard, the test draft shall be equal to at least the amount delivered by the device in two minutes at its maximum discharge rate.

(Amended 20XX)

~~T.3. On Tests Using Transfer Standards. – To the basic tolerance values that would otherwise be applied, there shall be added an amount equal to two times the standard deviation of the applicable transfer standard when compared to a basic reference standard.~~

B4: HGM-1 D N.4.1. Master Meter (Transfer) Standard Test, T.4. Tolerance Application on Test Using Transfer Standard Test Method

Item under Consideration:
Amend NIST Handbook 44, Hydrogen Gas-Measuring Devices Tentative Code as follows:

N.4.1. Master Meter ~~(Transfer)~~ Field Standard Test. – When comparing a measuring system with a calibrated **~~transfer~~ field** standard, the minimum test shall be one test draft at the declared minimum measured quantity and one test draft at approximately ten times the minimum measured quantity or 1 kg, whichever is greater. More tests may be performed over the range of normal quantities dispensed.

(Amended 20XX)

~~T.4. Tolerance Application on Test Using Transfer Standard Test Method. – To the basic tolerance values that would otherwise be applied, there shall be added an amount equal to two times the standard deviation of the applicable transfer standard when compared to a basic reference standard.~~

B4: GMM-1 D 5.56(a): N.1.1. Air Oven Reference Method Transfer Standards, N.1.3. Meter to Like-Type Meter Method Transfer Standards and 5.56(b): N.1.1. Transfer Standards, T. Tolerances[1]

Item under Consideration:
Amend NIST Handbook 44, Grain Moisture Meters Code as follows:

5.56.(a) Grain Moisture Meters

N.1.1. Air Oven Reference Method ~~Transfer~~ Field Standards. – Official grain samples shall be used as the official **~~transfer~~ field** standards with moisture content and test weight per bushel values assigned by the reference methods. The reference methods for moisture shall be the oven drying methods as specified by the USDA GIPSA. The test weight per bushel value assigned to a test weight field standard shall be the average of 10 test weight per bushel determinations using the quart kettle test weight per bushel apparatus as specified by the USDA GIPSA. Tolerances shall be applied to the average of at least three measurements on each official grain sample. Official grain samples shall be clean and naturally moist, but not tempered (i.e., water not added).

(Amended 1992, 2001, ~~and~~ 2003**, and 20XX**)

N.1.3. Meter to Like-Type Meter Method Field Standards. – Properly standardized reference meters using National Type Evaluation Program approved calibrations shall be used as **~~transfer~~ field** standards. A reference meter shall be of the same type as the meter under test. Tests shall be conducted side-by-side using, as a comparison medium, grain samples that are clean and naturally moist, but not tempered (i.e., water not added).

(Added 2001) **(Amended 20XX)**

5.56.(b) Grain Moisture Meters

N.1.1. ~~Transfer~~ Field Standards. – Official grain samples shall be used as the official **~~transfer~~ field** standards with moisture content values assigned by the reference methods. The reference methods shall be the oven drying methods as specified by the USDA GIPSA. Tolerances shall be applied to the average of at least three measurements on each official grain sample. Official grain samples shall be clean and naturally moist, but not tempered (i.e., water not added).

(Amended 1992 **and 20XX**)

T. Tolerances[1]

[1]These tolerances do not apply to tests in which grain moisture meters are the **~~transfer~~ field** standards.

(Amended 20XX)

B4: LVS-1 D N.2. Testing Standards

Item under Consideration:
Amend NIST Handbook 44, Electronic Livestock, Meat and Poultry Evaluation Systems and/or Devices Code as follows:

N.2. ~~Testing~~ Field Standards. – ASTM Standard F2343 requires device or system users to maintain accurate **~~reference~~ field** standards that meet the tolerance expressed in NIST Handbook 44 Fundamental Considerations, paragraph 3.2. Tolerances for Standards (i.e., one-third of the smallest tolerance applied).

(Amended 20XX)

B4: OTH-2 D Appendix A: Fundamental Considerations, 3.2. Tolerances for Standards, 3.3. Accuracy of Standards

Item under Consideration:
Amend NIST Handbook 44, Appendix A: Fundamental Considerations as follows:

3.2. Tolerances for Field Standards. – Except for work of relatively high precision, it is recommended that the accuracy of standards used in testing commercial weighing and measuring equipment be established and maintained so that the use of corrections is not necessary. When the standard is used without correction, its combined error and uncertainty must be less than one-third of the applicable device tolerance.

Device testing is complicated to some degree when corrections to standards are applied. When using a correction for a standard, the uncertainty associated with the corrected value must be less than one-third of the applicable device tolerance. The reason for this requirement is to give the device being tested as nearly as practicable the full benefit of its own tolerance.

(Amended 20XX)

3.3. Accuracy of Field Standards. – Prior to the official use of testing apparatus, its accuracy should invariably be verified. Field standards should be calibrated as often as circumstances require. By their nature, metal volumetric field standards are more susceptible to damage in handling than are standards of some other types. A field standard should be calibrated whenever damage is known or suspected to have occurred or significant repairs have been made. In addition, field standards, particularly volumetric standards, should be calibrated with sufficient frequency to affirm their continued accuracy, so that the official may always be in an unassailable position with respect to the accuracy of his testing apparatus. Secondary field standards, such as special fabric testing tapes, should be verified much more frequently than such basic standards as steel tapes or volumetric provers to demonstrate their constancy of value or performance.

Accurate and dependable results cannot be obtained with faulty or inadequate field standards. If either the service person or official is poorly equipped, their results cannot be expected to check consistently. Disagreements can be avoided, and the servicing of commercial equipment can be expedited and improved if service persons and officials give equal attention to the adequacy and maintenance of their testing apparatus.

(Amended 20XX)

B4: OTH-3 D Appendix D – Definitions: fifth-wheel, official grain samples~~, transfer standard~~ and Standard, Field

Item under Consideration:
Amend NIST Handbook 44, Appendix A: Fundamental Considerations as follows:

fifth wheel. – A commercially-available distance-measuring device which, after calibration, is recommended for use as a field ~~**transfer**~~ standard for testing the accuracy of taximeters and odometers on rented vehicles. [5.53, 5.54]

(Amended 20XX)

official grain samples. – Grain or seed used by the official as the official ~~**transfer**~~ **field** standard from the reference standard method to test the accuracy and precision of grain moisture meters. [5.56(a), 5.56(b)]

(Amended 20XX)

~~**transfer standard. – A measurement system designed for use in proving and testing cryogenic liquid-measuring devices. [3.38]**~~

Standard, Field. – A physical standard that meets specifications and tolerances in NIST Handbook 105-series standards (or other suitable and designated standards) and is traceable to the reference or working standards through comparisons, using acceptable laboratory procedures, and used in conjunction with commercial weighing and measuring equipment.

(Added 20XX)

Background and Discussion:
The term “transfer standard” is currently defined in HB 44 as only being applicable to the Cryogenic Liquid Measuring Devices Code. This definition should be removed as it is very limited in scope and the item termed a “transfer standard” is, in fact, a robust working measurement standard used in field conditions, better termed and shortened to “field standard.” All instruments/devices used as a field standard in the testing of Weighing and Measuring Devices, regardless of nomenclature, must comply with the requirements of HB 44, Appendix A, Fundamental Considerations Associated with the Enforcement of Handbook 44 Codes, paragraph 3.2 Testing Apparatus, Adequacy. Using the term transfer standard as it is recently being applied in no way negates this requirement of adequacy and confuses the user as to the nature of the field standard being used.

Use of the single word “standard” to signify use of a field standard can be confusing as there are a number of different meanings associated with “standard.” It could be a documentary standard (i.e., HB 44); a primary standard used to realize the SI (i.e., Watt Balance); a laboratory reference standard used to ensure traceability of laboratory measurements to the SI (i.e., NIST calibrated laboratory standards); or a laboratory check standard used to monitor the laboratory process. Use of the single word “standard” requires that the reader understand completely the context of its use. Instead, using the term “field standard” ensures that the reader understands that the item described is a robust working standard used in field conditions to ensure traceability of the subordinate measurements to the SI and leaves no ambiguity in its meaning.

Thus, the recommended changes to NIST HB 44 align that document with NIST HB 130, removing ambiguity and adding clarity to the use of field standards for device testing.

NIST HB 130 does NOT contain the term "transfer standard" in any location and already contains the definition and appropriate use of the term "field standard" in the following locations:

1.12. Standard, Field. – A physical standard that meets specifications and tolerances in NIST Handbook 105-series standards (or other suitable and designated standards) and is traceable to the reference or working standards through comparisons, using acceptable laboratory procedures, and used in conjunction with commercial weighing and measuring equipment. (Added 2005)

Uniform Weights and Measures Law

Section 3. Physical Standards

Weights and measures that are traceable to the U.S. prototype standards supplied by the Federal Government, or approved as being satisfactory by NIST, shall be the state reference and working standards of weights and measures, and shall be maintained in such calibration as prescribed by the NIST as demonstrated through laboratory accreditation or recognition. All field standards may be prescribed by the Director and shall be verified upon their initial receipt and as often thereafter as deemed necessary by the Director.
(Amended 2005)

Section 12. Powers and Duties of the Director

The Director shall:

…

(h) verify the field standards for weights and measures used by any jurisdiction within the state, before being put into service, tested annually or as often thereafter as deemed necessary by the Director based on statistically evaluated data, and approve the same when found to be correct;
(Amended 2005)

Uniform Regulation for the Voluntary Registration of Servicepersons and Service Agencies for Commercial Weighing and Measuring Devices

Section 1. Policy

For the benefit of the users, manufacturers, and distributors of commercial weighing and measuring devices, it shall be the policy of the Director of Weights and Measures, hereinafter referred to as "Director," to accept registration of (a) an individual and (b) an agency providing acceptable evidence that he, she, or it is fully qualified by training or experience to install, service, repair, or recondition a commercial weighing or measuring device; has a thorough working knowledge of all appropriate weights and measures laws, orders, rules, and regulations; and has possession of, or has available for use, and will use suitable and calibrated weights and measures field standards and testing equipment appropriate in design and adequate in amount. (An employee of the government shall not be eligible for registration.)

The Director will check the qualifications of each applicant. It will be necessary for an applicant to have available sufficient field standards and equipment (see Section 5, Minimum Equipment).

Section 9. Examination and Calibration or Certification of Standards and Testing Equipment – All field standards that are used for servicing and testing weights and measures devices for which competence is registered shall be submitted to the Director for initial and subsequent verification and calibration at intervals determined by the Director. A registered serviceperson or registered service agency shall not use in servicing commercial weighing or measuring devices any field standards or testing equipment that have not been calibrated or verified by the Director. In lieu of submission of physical standards, the Director may accept calibration and/or verification reports from any laboratory that is formally accredited or recognized. The Director shall maintain a list of organizations from which the state will accept calibration reports. The state shall retain the right to periodically monitor calibration results and/or to verify field standard compliance to specifications and tolerances when field standards are initially placed into service or at any intermediate point between calibrations.

(Added 1966) (Amended 1984, 1999, and 2005)

During the 2018 NCWM Interim Meeting opening hearings, the Committee heard comments from Mr. Dmitri Karimov (Liquid Controls), speaking on behalf of the MMA, who reported that the MMA supports the proposed changes for the items that relate to metering. Mr. Russ Vires (Mettler-Toledo, LLC), speaking on behalf of the SMA, reported that regarding SCL-4, ABW-1, and AWS-1, the SMA recommends these items be assigned a Developing status. Mr. Henry Oppermann (Weights and Measures Consulting, LLC) representing Seraphin Test Measure Co., however, speaking on his own behalf, recommended that these items be Developing items. Mr. Oppermann provided the Committee with written comments supporting his recommendation.

Mr. Ross Andersen (New York, retired) commented that, if we take Mr. Oppermann at his word, then all of our 5- gallon provers and our large volume provers would fail. The standard of one-third is for lab testing but not field testing. Evaluation of field standards in the field means that all variables would have to be considered. The equipment, all individual inspectors, all individual service personnel, and the environmental factors, would all have to be evaluated.

Mr. Oppermann rebutted that he did not say it is necessary to analyze all the variables that are in the field. Rather, that you have to be sure that your standard is valid when it’s used in the field. You need an accurate standard when your using it in the field. If it is not accurate, it may not be qualified as a field standard.

Mr. Michael Keilty (Endress & Hauser Flowtec AG USA) commented he feels that the items related to measuring devices need more work. For example, CDL-1 and CLM-1 don’t say if it’s a scale or a meter, so what is it? He recommended this be a Developing item.

During the Committee’s work session, members of the Committee considered the comments heard on this block of items and agreed to recommend that the entire block of items be designated Developing. The Committee also concluded that all of the Block 5 items, as well as LPG-4, and MFM-2 are related to the Block 4 items due to terminology, and that the submitter of the Block 4 items (OWM) provide detail of their developing language to the submitter of the related items (Endress & Hauser Flowtec AG USA) to prevent conflicting terms as they are considered during future meetings.

The Committee did not take comments during open hearings on Developing items at the 2018 NCWM Annual Meeting except to grant the submitter of a Developing item (or block of Developing items) an opportunity to provide an update on the progress made to further develop the item(s) since the 2018 NCWM Interim Meeting. During the S&T Committee open hearings at the 2018 Annual Meeting, Ms. Diane Lee, (NIST OWM) provided the S&T with an update on Block 4 Developing Items. She mentioned that Mr. Val Miller (NIST OWM) developed the language and has been presenting information (as noted in the background information) on this block of items at several of the regional meetings. She also mentioned that due to the number of comments received, OWM agreed with the Developing status for this item. Some of the comments received included whether or not current standards referred to as “transfer standards” should be considered “field standards” and if these standards were intended to or can meet the Fundamental Considerations that state “when the standard is used without correction its combined error and uncertainty must be less than one-third of the applicable tolerance.”

Also, in line with the discussion of the term “field standard” and also the need to review data on master meters used as field standards, Ms. Lee reported OWM is in the process of purchasing the following six Coriolis meters for the purpose of collecting and analyzing data obtained from field testing using this method:

- two ½-inch meters;
- one 1-inch meter;
- two 1 ½ inch meters;

- one 3-inch meter; and
- one ½-inch meter, specific for testing CNG.

The Committee received written comments from Seraphin Test Measure Company on all items in Block 4 and Block 5, as well as LPG-4 and MFM-2 emphasizing the need for there to be more study and discussion of the issues to assess the ramifications of all the proposed changes.

The Committee also received written comments from the SMA that it looks forward to further information on these items. It is important to be consistent in our use of terms across multiple sections of Handbook 44.

The Committee agreed to carryover this block of items on its 2019 agenda to allow for further discussion and development of these proposals.

Regional Association Comments:
At its 2017 fall Annual Meeting, the WWMA agreed to recommend this item and all related items as Developing items. WWMA's S&T Committee identified some standards that may not be able to achieve the one-third standard in the Fundamental Considerations in Handbook 44. The Committee would also like some clarification as to the intent of these changes, i.e., is it the intent to have a 105-series standard for all field standards and current transfer standards? Lastly the Committee would like the submitter to consider retaining and clarify the definition of "Transfer Standard" and perhaps expand the application of the definition to include other device codes.

At SWMA's 2017 fall Annual Meeting, the Committee heard comments from Mr. Bob Murnane (Seraphin Test Measure), who recommended withdrawing these items, further developing them, and then resubmitting them. Mr. Murnane also provided written comments on these items, noting that in addition to the above items, there are two carryover items on the Committee's report on "transfer standards" and two new items related to this topic. The Committee heard from Mrs. Tina Butcher (NIST OWM) who noted that OWM's goal was to attempt to align the terminology that is used in various sections of the HB 44 (including the Fundamental Considerations) relative to standards used in testing. These proposals came about as a result of OWM's analysis of the two carryover items referenced by Mr. Murnane. Mrs. Butcher acknowledged that additional work may be needed given the comments that have been heard. The SWMA recommended these items remain as Developing items.

At its 2017 fall Interim Meeting, the CWMA's S&T Committee received written comments from Seraphin Test Measure asking for the status of this item to be designated as Developmental. The CWMA recommended the item as a Developing item. At CWMA's spring 2018 Annual Meeting, Mr. Richard Harshman (NIST OWM) commented on this block of items saying the changes proposed are editorial and that the items are fully developed. The CWMA agreed and recommended they be made a Voting item in the next NCWM cycle.

At NEWMA's fall 2017 Interim Meeting, a comment was heard suggesting the definition could cause issues categorizing several "field standards" into "transfer standards" when this is not always the case. The intention is a nice idea, but incorrect to say that everything used in the field is a "transfer standard." NEWMA reported it believes this item has merit but requires further development by the submitter. At NEWMA's spring 2018 Annual Meeting, comments were heard from the SMA, NIST and others in support of the development of this item. NEWMA recommended this be a Developing item.

Additional letters, presentations, and data may have been submitted for consideration with this item. Please refer to **www.ncwm.com/interim-archive** to review these documents.

BLOCK 5 ITEMS (B5) DEFINE "FIELD REFERENCE STANDARD"

B5: CLM-2	D	N.3.2. Transfer Standard Test and T.3. On Tests Using Transfer Standards
B5: CDL-2	D	N.3.2. Transfer Standard Test and T.3. On Tests Using Transfer Standards
B5: HGM-2	D	N.4.1. Master Meter (Transfer) Standard Test and T.4. Tolerance Application on Test Using Transfer Standard Test Method
B5: OTH-4	D	Appendix D – Definitions: field reference standard meter and ~~transfer standard~~

Source:
Endress+Hauser Flowtec AG (2018)

Purpose:
Add definition field reference standard meter to HB 44. Delete transfer standard definition. Change terms in sections 3.34, 3.38 and 3.39.

B5: CLM-2 D N.3.2. Transfer Standard Test and T.3. On Tests Using Transfer Standards

Item under Consideration:
Amend NIST Handbook 44, Cryogenic Liquid-Measuring Devices Code as follows:

N.3.2. Field Reference~~Transfer~~ Standard Meter Test. – When comparing a meter with a calibrated **field reference~~transfer~~** standard **meter**, the test draft shall be equal to at least the amount delivered by the device in two minutes at its maximum discharge rate, and shall in no case be less than 180 L (50 gal) or equivalent thereof. When testing uncompensated volumetric meters in a continuous recycle mode, appropriate corrections shall be applied if product conditions are abnormally affected by this test mode.

(Amended 1976 **and 20XX**)

T.3. On Tests Using Field ReferenceTransfer Standard~~s~~ Meters. – To the basic tolerance values that would otherwise be applied, there shall be added an amount equal to two times the standard deviation of the applicable **field reference~~transfer~~** standard **meter** when compared to a basic reference standard. (Added 1976)

B5: CDL-2 D N.3.2. Transfer Standard Test and T.3. On Tests Using Transfer Standards

Item under Consideration:
Amend NIST Handbook 44, Carbon Dioxide Liquid-Measuring Devices Code as follows:

N.3.2. Field Reference~~Transfer~~ Standard Meter Test. – When comparing a meter with a calibrated **field reference~~transfer~~** standard **meter**, the test draft shall be equal to at least the amount delivered by the device in two minutes at its maximum discharge rate.

(Amended 20XX)

T.3. On Tests Using Field Reference~~Transfer~~ Standard~~s~~ Meters. – To the basic tolerance values that would otherwise be applied, there shall be added an amount equal to two times the standard deviation of the applicable **field reference~~transfer~~** standard when compared to a basic **field reference~~reference~~** standard **meter**.

B5: HGM-2 D N.4.1. Master Meter (Transfer) Standard Test and T.4. Tolerance Application on Test Using Transfer Standard Test Method

Item under Consideration:
Amend NIST Handbook 44, Hydrogen Gas-Measuring Devices Tentative Code as follows:

N.4.1. Field Reference~~Master Meter (Transfer)~~ Standard Meter Test. – When comparing a measuring system with a calibrated **field reference~~transfer~~** standard **meter**, the minimum test shall be one test draft at the declared minimum measured quantity and one test draft at approximately ten times the minimum measured quantity or 1 kg, whichever is greater. More tests may be performed over the range of normal quantities dispensed.

(Amended 20XX)

T.4. Tolerance Application on Test Using Field Reference~~Transfer~~ Standard Meters Test Method. – To the basic tolerance values that would otherwise be applied, there shall be added an amount equal to two times the standard deviation of the applicable **field reference**~~transfer~~ standard **meter** when compared to a basic reference standard.

B5: OTH-4 D Appendix D – Definitions: field reference standard meter and ~~transfer standard~~

Item under Consideration:
Amend NIST Handbook 44, Appendix D as follows:

field reference standard meter – A measurement system designed for use in proving and testing measuring devices and meters.

~~**transfer standard - A measurement system designed for use in proving and testing cryogenic liquid-measuring devices.**~~

Background/Discussion:
During S&T open hearings discussion in July 2017 it was pointed out that the term transfer standard which is used in the proposal to amend HB 44 3.37 N.3 and 3.32 N.3 Test Drafts is incorrect. The statement made also suggested that the use of transfer standard is incorrectly used in HB 44 code sections 3.34, 3.38 and 3.39. It was suggested that a more appropriate term to use is field reference standard or field reference standard meter. There is no definition in OIML G18 which supports the use of the term transfer standard. There is suggestive basis to support reference standard as it is used textually in OIML G18.

1. NIST has no procedural documents in place to justify the revision with a definition. The definition of transfer standard is used in code sections 3.34, 3.38 and 3.39 and that those sections do not need to change.

During the 2018 NCWM Interim Meeting, open hearings, the Committee heard comments from Mr. Michael Keilty (Endress & Hauser Flowtec AG USA), submitter of this block of items. Mr. Keilty reported he had developed this proposal with help from Mr. Henry Oppermann (Weights and Measures Consulting, LLC). In written comments to the Committee by Mr. Oppermann, on another item. Mr. Oppermann opposed the term "Transfer Standard" in that it is a temporary measurement reference. Mr. Keilty stated that he agrees with this interpretation and states that what he is proposing is for a "field reference standard meter" term and recommends that the items move forward (he did not specify to what status).

Mr. Oppermann provided comments for Stand Alone Items LPG-4 and MFM-2. Mr. Oppermann agrees with Mr. Keilty that these are field standards, however, the terminology "field reference standard meter" should just be "field standard." Anything that meets the one-third requirement should be accepted, but currently, there is no data to prove that these can meet the one-third requirement. He stated that this proposal specifies that the size of the test draft be in two minutes but has no explanation for the size, and it conflicts with the previous proposal that said that larger test drafts were needed. He also stated that the definition for "field reference standard meter" is vague and insufficient; the requirements for accuracy and repeatability are not defined. He commented that a NIST 105 series handbook is not yet established for these and that there are currently no test procedures or parameters for performance requirements to demonstrate these systems can meet the requirements. The definition would apply to all codes and more study and assessment is needed. He commented that more data is needed before this is moved forward, and that the items should be given a Developing status.

Mr. Constantine Cotsoradis (Flint Hills Resources) provided comments specific to Agenda Item MFM-2 (see Item MFM-2 to view his comments).

Mr. Keilty asked the Committee that it be noted the two previous commenters, Mr. Oppermann and Mr. Cotsoradis, were speaking to stand-alone Items LPG-4 and MFM-2, and not only Block-5.

Mr. Dmitri Karimov (Liquid Controls), speaking on behalf of the MMA, reported that while the MMA supports Block 4, the terminology in Block 5 conflicts with that in Block 4 and therefore recommends that the items be Developing.

Mr. Ross Andersen (New York, retired) commented that all standards are a transfer standard, transferred from one measurement to another. He stated that what is needed is to make sure that the standard we use is accurate to one-third of the applied tolerance. In regard to the data that has been discussed, he asked where is the data for what we use now? There is none. It was just selected. He stated that what we need is one test method as the "referee standard" and that whatever test method is used, that it can agree with the reference.

During the Committee's work session, the members considered the comments heard on this block of items. The Committee agreed to recommend that this block of items move forward as Developing. The Committee also agreed that all the Block 5 items, as well as LPG-4, and MFM-2 items are related to the Block 4 items due to terminology and that the submitter of Block 4 (NIST OWM) provide detail of their developing language to the submitter of the related items (Endress & Hauser Flowtec AG USA) to prevent conflicting terms as they are considered during future meetings.

At the 2018 NCWM Annual Meeting, the Committee did not take comments during open hearings on Developing items except to grant the submitter of a Developing item (or block of Developing items) an opportunity to provide an update on the progress made to further develop the item(s) since the 2018 NCWM Interim Meeting. Ms. Diane Lee (NIST OWM) noted during her update of Block 4 agenda items that the terminology agreed to in Block 4 would impact the terminology used in Block 5 agenda items. She also reiterated NIST OWM comments on additional data needed to support the NIST Fundamental Considerations and the work that NIST will be doing to collect and review data on the use of master meters, including purchase of six Coriolis meters as follows:

- two ½-inch meters;
- one 1-inch meter;
- two 1 ½ inch meters;
- one 3-inch meter; and
- one ½-inch meter, specific for testing CNG.

Mr. Keilty the developer of this item mentioned this item has been before the NCWM since 2015. He agreed that the definitions are confusing and agrees with the work that NIST is doing to clarify the terminology. Mr. Keilty recommended that any new information be presented at the January meeting and recommends that Block 5 items move forward as Voting items at the 2019 NCWM Annual Meeting.

The Committee received written comments from Seraphin Test Measure Company on all items in Block 4 regarding "transfer standards," raising several concerns and recommending the items remain developing until such time those concerns have been resolved.

OWM provided the following written recommendations and comments to this block of items as feedback to the submitter and as part of its analysis of the S&T Committee's 2018 agenda items:

> This item is closely related to items in Block 4 and LPG-4 and MFM-2. OWM believes additional work is needed on all those items; therefore, assigning the items in this block a "Developmental" status is appropriate. See also OWM's comments regarding terminology in those items.

The Committee agreed to carryover this block of items on its 2019 agenda to allow for further discussion and development of these proposals.

Regional Association Comments:

NIST Technical Advisor note: *These items were grouped differently on the 2017 WWMA and SWMA S&T Committee agendas compared to how they were grouped in 2018 NCWM Publication 16. Thus, to view the recommendations and comments from these two regional associations for each of the items listed in this group, refer to their 2017 S&T Committee Annual Meeting Report.*

At its fall 2017 Interim Meeting, the CWMA S&T Committee received written statements from Seraphin asking this item to be Developing. Until data is provided and evaluated that shows the proposed field standards can perform at the level needed for a field standard, the CWMA recommended that this be a Developing item. Hearing no comments on this group of items at the 2018 spring Annual Meeting, CWMA recommended them as Developing on the NCWM agenda.

NEWMA recommended this group of items be Developing at both its fall 2017 Interim Meeting and spring 2018 Annual Meeting. NEWMA noted in its report that the developing language and terminology needs to be shared from Block 4.

Additional letters, presentations, and data may have been submitted for consideration with this item. Please refer to **www.ncwm.com/interim-archive** to review these documents.

BLOCK 6 ITEMS (B6) ALIGN VAPOR ELIMINATION REQUIREMENTS AMONG CODES

Source:
NIST OWM (2018)

Purpose:
To align language in HB 44 Sections 3.32 LPG and Anhydrous Ammonia (NH_3) Liquid-Measuring Devices Code; 3.34 Cryogenic Liquid Measuring Devices Code; and 3.38. Carbon Dioxide Liquid-Measuring Devices Code with changes adopted in 2017 to the Liquid-Measuring Devices Code; the Vehicle-Tank Meters Code; the Milk Meters Code; the Water Meters Code; and the Mass Flow Meters Code.

B6: LPG-1 V S.2.1. Vapor Elimination. (See related items New-17 and New-18)

(This item was Adopted.)

Item under Consideration:
Amend NIST Handbook 44 LPG and Anhydrous Ammonia Liquid-Measuring Devices as follows:

> **S.2.1. Air/Vapor Elimination.** A ~~**device**~~ **measuring system** shall be equipped with an effective **air/vapor eliminator or other** automatic means to prevent the passage of **air/**vapor through the meter. Vent lines from the **air/**vapor eliminator shall be made of appropriate non-collapsible material.
>
> (Amended 2016 **and 2018**)

B6: CLM-3 V S.2.1. Vapor Elimination.

(This item was Adopted.)

Item under Consideration:
Amend NIST Handbook 44, Cryogenic Liquid-Measuring Devices Code as follows:

> **S.2.1. Air/Vapor Elimination.** – A measuring system shall be equipped with an effective **air/**vapor eliminator or other ~~**effective**~~ **automatic** means to prevent the ~~measurement of vapor that will cause errors in excess of the applicable tolerances~~ **passage of air/vapor through the meter. Vent lines from the air/vapor eliminator shall be made of appropriate non-collapsible material.** (Also see Section T. Tolerances.)
>
> **(Amended 2018)**

B6: CDL-3 V S.2.1. Vapor Elimination.

(This item was Adopted.)

Item under Consideration:
Amend NIST Handbook 44, Carbon Dioxide Liquid-Measuring Devices Code as follows:

S.2. Design of Measuring Elements.

S.2.1. Air/Vapor Elimination.

~~(a)~~ A ~~device~~ **measuring system** shall be equipped with an effective **air/vapor eliminator or other** automatic means to prevent the passage of **air/**vapor through the meter.

~~(b)~~ Vent lines from the **air/**vapor eliminator shall be made of appropriate non-collapsible material.

(Amended 2016 **and 2018**)

Background/Discussion:
In 2016, changes were made to the requirements for vapor elimination in the LPG & NH_3 code to make the requirement less design-specific; clarify that the means provided for vapor elimination must be "effective;" and recognize that the vent line need not be rigid, provided the material chosen is effective at preventing the vent line from being obstructed. In 2017, corresponding changes were made to the Liquid-Measuring Devices Code; the Vehicle-Tank Meters Code; the Milk Meters Code; and the Water Meters Code. Similar changes were made at the same time to the Mass Flow Meters Code, with some slight variations in the language to reflect that the introduction of air into the meter does not create accuracy problems for some mass flow metering systems.

In the process of reviewing the proposals submitted in 2017, the NCWM S&T Committee heard comments that similar changes should be made to align the language in the vapor/air elimination paragraphs in all the measuring codes. At the Committee's suggestion, the submitters of the 2017 item, Mrs. Tina Butcher (NIST OWM) and Mr. Dmitri Karimov (Liquid Controls), prepared corresponding proposed changes to align the vapor/air elimination paragraph(s) in Sections 3.32, 3.34, and 3.38, including vetting these proposals with members of the MMA. The Committee felt that these changes could be incorporated into the existing proposal; however, the BOD concluded that these additional changes needed to be introduced as a separate item in the next NCWM cycle. Rather than delay the items presented in 2017, the Committee decided to recommend those items for a vote and propose the remaining items for a vote in 2018. Consequently, this current proposal to modify Sections 3.32., 3.34., and 3.38. is being submitted as outlined during the 2017 Interim Meeting. Note that, although the paragraph in Section 3.32. was modified in 2016, the changes proposed to the other measuring codes in 2017 included some additional minor changes to align format and language.

The rationale for these changes is identical to that for changes already adopted in other codes. Unless someone comes forward with new information, there is no opposing argument that hasn't already been considered by the NCWM in its deliberations on previous items.

During the 2018 Interim Meeting opening hearings, the Committee heard comments from Mr. Karimov (representing the MMA) stating that the MMA was in favor of alignment of the requirement in the various liquid measuring codes.

During the Committee's work session, the members agreed to move the item forward as Voting.

At the 2018 NCWM Annual Meeting, the Committee received comments from Mrs. Tina Butcher (NIST OWM) who reported OWM had submitted the items in this block at the request of the NCWM S&T Committee as a follow-up to five items that were adopted at the 2017 NCWM Annual Meeting on the same topic. As with the items adopted in 2017, these items are intended to align the language across multiple measuring codes with respect to the requirements pertaining to vapor elimination. These proposals eliminate the term "rigid metal tubing" in favor of the less restrictive language, "appropriate non-collapsible material."

Mr. Karimov (Liquid Controls and speaking on behalf of the MMA) reported that the MMA supported the items in this block.

Mr. Michael Keilty (Endress + Hauser Flowtec AG USA) commented he also supported this block of items.

The Committee agreed to present this block of items for vote in consideration of the comments received.

Regional Association Comments:
The WWMA reported at its fall 2017 Annual Meeting that these items have merit and should be carried forward as Voting items.

At the SWMA's fall 2017 Annual Meeting, Mrs. Tina Butcher (NIST OWM) explained during open hearings that OWM submitted these items at the request of the NCWM S&T Committee as a follow-up from items that were adopted at the 2017 NCWM Annual Meeting on the same topic. She noted these items, as were the other items adopted in July 2017, are intended to align the language across multiple measuring codes and eliminate the reference to "rigid metal tubing" in favor of the more general language of "appropriate non-collapsible material." The Committee heard no other comments on these items and the SWMA recommended they be designated as Voting items.

At both its fall 2017 Interim and spring 2018 Annual Meetings, the CWMA recommended this group of items move forward for vote, noting the proposals include simply cleanup language to align these codes with changes that were adopted in 2017 to the LMD Code.

NEWMA recommended this group of items for vote at both its fall 2017 Interim and spring 2018 Annual Meetings. NEWMA reported these are housekeeping items which, include only editorial changes to align each of these codes with other measuring codes in NIST HB 44.

Additional letters, presentations, and data may have been submitted for consideration with this item. Please refer to **www.ncwm.com/interim-archive** to review these documents.

BLOCK 7 ITEMS (B7) ADDRESS DEVICES AND SYSTEMS ADJUSTED USING A REMOVABLE DIGITAL STORAGE DEVICE

REMOVABLE DIGITAL STORAGE DEVICE

B7: GEN-2	D	G-S.8.2. Devices and Systems Adjusted Using Removable Digital Device Storage
B7: SCL-5	D	S.1.11. Provision for Sealing.
B7: BCS-1	D	S.5. Provision for Sealing.
B7: ABW-2	D	S.1.6. Provision for Sealing Adjustable Components on Electronic Devices.
B7: AWS-2	D	S.1.3. Provision for Sealing.
B7: LMD-1	D	S.2.2. Provision for Sealing.
B7: VTM-2	D	S.2.2. Provision for Sealing.
B7: LPG-2	D	S.2.2. Provision for Sealing.
B7: HGV-1	D	S.2.2. Provision for Sealing.
B7: CLM-4	D	S.2.5. Provision for Sealing.
B7: MLK-1	D	S.2.3. Provision for Sealing.
B7: WTR-1	D	S.2.1. Provision for Sealing.
B7: MFM-1	D	S.3.5. Provision for Sealing.
B7: CDL-4	D	S.2.5. Provision for Sealing.
B7: HGM-3	D	S.3.3. Provision for Sealing.
B7: EVF-1	D	S.3.3. Provision for Sealing.
B7: TIM-1	D	S.4. Provision for Sealing.
B7: GMM-2	D	S.2.5. Provision for Sealing.
B7: MDM-1	D	S.1.11. Provision for Sealing.

Source:
NIST Office of Weights and Measures (2013)

Purpose:
Expand the scope of sealing requirements to cover devices which can be configured with removable digital storage devices and which is not adequately covered by the current definition of "remote configuration capability."

B7: GEN-2 D G-S.8.2. Devices and Systems Adjusted Using Removable Digital Device Storage

Item Under Consideration:
Modify the General Code as follows:

G-S.8.2. Devices and Systems Adjusted Using Removable Digital Storage Device. - For devices and systems in which the configuration or calibration parameters can be changed by use of a removable digital storage device*, such as a secure digital (SD) card, USB flash drive, etc., security shall be provided for those parameters using either (1) an event logger in the device; or (2) a physical seal that must be broken in order to remove the digital storage device from the device (or system). If security is provided using an event logger, the event logger shall include an event counter (000 to 999), the parameter ID, the date and time of the change, and the new value of the parameter. A printed copy of the information must be available on demand through the device or through another on-site device. In addition to providing a printed copy of the information, the information may be made available electronically. The event logger shall have a capacity to retain records equal to 10 times the number of sealable parameters in the device, but not more than 1000 records are required. (Note: Does not require 1000 changes to be stored for each parameter.)

*** Applies only to removable digital storage devices that must remain in the device or system for it to be operational.**

(Added 20XX)

B7: SCL-5 D S.1.11. Provision for Sealing.

Item Under Consideration:
Modify the Scales Code as follows:

S.1.11.1 Devices and Systems Adjusted Using a Removable Digital Storage Device. –- For devices and systems in which the calibration or configuration parameters, as defined in Appendix D, can be changed by use of a removable digital storage device, security shall be provided for those parameters as specified in G-S.8.2.

S.1.11.2 All Other Devices. – ***Except on Class I scales and devices specified in S.1.11.1. the following provisions for sealing applies:***

(a) *Provision shall be made for applying a security seal in a manner that requires the security seal to be broken before an adjustment can be made to any component affecting the performance of an electronic device.*

[Nonretroactive as of January 1, 1979]

(b) *A device shall be designed with provision(s) for applying a security seal that must be broken, or for using other approved means of providing security (e.g., data change audit trail available at the time of inspection), before any change that detrimentally affects the metrological integrity of the device can be made to any electronic mechanism.*

[Nonretroactive as of January 1, 1990]

(c) Audit trails shall use the format set forth in Table S.1.11.
[Nonretroactive as of January 1, 1995]

A device may be fitted with an automatic or a semi-automatic calibration mechanism. This mechanism shall be incorporated inside the device. After sealing, neither the mechanism nor the calibration process shall facilitate fraud.

(Amended 1989, 1991, 1993**,** and **20XX**)

B7: BCS-1 D S.5. Provision for Sealing.

Item Under Consideration:
Modify the Belt-Conveyor Scale Systems Scales Code as follows:

S.5. Provision for Sealing. – **For devices and systems in which the configuration or calibration parameters can be changed by use of a removable digital storage device, security shall be provided for those parameters as specified in G-S.8.2.** ***For all other devices,*** **the following provisions for sealing apply:**

A device shall be designed using the format set forth in Table S.5. with provision(s) for applying a security seal that must be broken, or for using other approved means of providing security (e.g. data change audit trail available at the time of inspection), before any change that affects the metrological integrity of the device can be made to any electronic mechanism.
[Nonretroactive as of January 1, 1999]

(Added 1998) **(Amended 20XX)**

B7: ABW-2 D S.1.6. Provision for Sealing Adjustable Components on Electronic Devices.

Item Under Consideration:
Modify the Automatic Bulk Weighing Systems Code as follows:

S.1.6. Provision for Sealing Adjustable Components on Electronic Devices. – **For devices and systems in which the configuration or calibration parameters can be changed by use of a removable digital storage device, security shall be provided for those parameters as specified in G-S.8.2. For parameters adjusted using other means, p**~~P~~rovision shall be made for applying a security seal in a manner that requires the security seal to be broken before an adjustment can be made to any component affecting the performance of the device.

(Amended 20XX)

B7: AWS-2 D S.1.3. Provision for Sealing.

Item Under Consideration:
Modify the Automatic Weighing Systems Code as follows:

S.1.3. Provision for Sealing.

(a) **Automatic Weighing Systems, Except Automatic Checkweighers.** – **For devices and systems in which the configuration or calibration parameters can be changed by use of a removable digital storage device, security shall be provided for those parameters as specified in G-S.8.2.**

For parameters adjusted using other means, a ~~A~~ device shall be designed with provision(s) as specified in Table S.1.3. Categories of Device and Methods of Sealing for applying a security seal that must be broken, or for using other approved means of providing security (e.g., data change audit trail available at the time of inspection), before any change that detrimentally affects the metrological integrity of the device can be made to any electronic mechanism.

b) **For Automatic Checkweighers.** – Security seals are not required in applications where it would prohibit an authorized user from having access to the calibration functions of a device.

(Amended 20XX)

B7: LMD-1 D S.2.2. Provision for Sealing.

Item Under Consideration:
Modify the Liquid-Measuring Devices Code as follows:

S.2.2. Provision for Sealing – For devices and systems in which the configuration or calibration parameters can be changed by use of a removable digital storage device, security shall be provided for those parameters as specified in G-S.8.2. For parameters adjusted using other means, the following applies:

Adequate provision shall be made for an approved means of security (e.g., data change audit trail) or for physically applying a security seal in such a manner that requires the security seal to be broken before an adjustment or interchange can be made of:

(a) any measuring or indicating element;

(b) any adjustable element for controlling delivery rate when such rate tends to affect the accuracy of deliveries; and

(c) any metrological parameter that will affect the metrological integrity of the device or system.

When applicable, the adjusting mechanism shall be readily accessible for purposes of affixing a security seal.
*[Audit trails shall use the format set forth in Table S.2.2.]**
*[*Nonretroactive and Enforceable as of January 1, 1995]*
(Amended 1991, 1993, 1995, 2006**,** and **20XX**)

B7: VTM-2 D S.2.2. Provision for Sealing.

Item Under Consideration:
Modify the Vehicle-Tank Meters Code as follows:

S.2.2. Provision for Sealing. – For devices and systems in which the configuration or calibration parameters can be changed by use of a removable digital storage device, security shall be provided for those parameters as specified in G-S.8.2. For parameters adjusted using other means, the following applies:

Adequate provision shall be made for an approved means of security (e.g., data change audit trail) or for physically applying a security seal in such a manner that requires the security seal to be broken before a change or an adjustment or interchange may be made of:

(a) any measuring or indicating element;

(b) any adjustable element for controlling delivery rate when such rate tends to affect the accuracy of deliveries; and

(c) any metrological parameter that will affect the metrological integrity of the device or system.

When applicable, the adjusting mechanism shall be readily accessible for purposes of affixing a security seal.
*[Audit trails shall use the format set forth in Table S.2.2. Categories of Device and Methods Sealing.]**
*[*Nonretroactive as of January 1, 1995]*
(Amended 2006 **and 20XX**)

B7: LPG-2 D S.2.2. Provision for Sealing.

Item Under Consideration:
Modify the LPG and Anhydrous Ammonia Liquid-Measuring Device s Code as follows:

S.2.2. Provision for Sealing. For devices and systems in which the configuration or calibration parameters can be changed by use of a removable digital storage device, security shall be provided for those parameters as specified in G-S.8.2. For parameters adjusted using other means, the following applies:

Adequate provision shall be made for an approved means of security (e.g., data change audit trail) or for physically applying a security seal in such a manner that requires the security seal to be broken before an adjustment or interchange may be made of:

(a) any measuring or indicating element;

(b) any adjustable element for controlling delivery rate, when such rate tends to affect the accuracy of deliveries; and

(c) any metrological parameter that will affect the metrological integrity of the device or system.

When applicable, the adjusting mechanism shall be readily accessible for purposes of affixing a security seal.

*[Audit trails shall use the format set forth in Table S.2.2. Categories of Device and Methods of Sealing.]**
*[*Nonretroactive as of January 1, 1995]*
(Amended 2006 **and 20XX**)

B7: HGV-1 D S.2.2. Provision for Sealing.

Item Under Consideration:
Modify the Hydrocarbon Gas Vapor-Measuring Devices Code as follows:

S.2.2. Provision for Sealing. For devices or systems in which the configuration or calibration parameters can be changed by use of a removable digital storage device, security shall be provided for those parameters as specified in G-S.8.2. For parameters adjusted using other means, the following applies:

Adequate provision shall be made for applying security seals in such a manner that no adjustment or interchange may be made of any measurement element.
(Amended 20XX)

B7: CLM-4 D S.2.5. Provision for Sealing.

Item Under Consideration:
Modify Cryogenic Liquid-Measuring Devices Code as follows:

S.2.5. Provision for Sealing. – **For devices or systems in which the configuration or calibration parameters can be changed by use of a removable digital storage device, security shall be provided for those parameters as specified in G-S.8.2. For parameters adjusted using other means, the following applies:**

Adequate provision shall be made for an approved means of security (e.g., data change audit trail) or for physically applying a security seal in such a manner that requires the security seal to be broken before an adjustment or interchange may be made of:

(a) any measuring or indicating element;

(b) any adjustable element for controlling delivery rate when such rate tends to affect the accuracy of deliveries;

(c) any automatic temperature or density compensating system; and

(d) any metrological parameter that will affect the metrological integrity of the device or system.

When applicable, any adjusting mechanism shall be readily accessible for purposes of affixing a security seal.
[Audit trails shall use the format set forth in Table S.2.5. Categories of Device and Methods of Sealing]*
[*Nonretroactive as of January 1, 1995]

(Amended 2006 **and 20XX**)

B7: MLK-1 D S.2.3. Provision for Sealing.

Item Under Consideration:
Modify the Milk Meters Code as follows:

S.2.3. Provision for Sealing. – **For devices and systems in which the configuration or calibration parameters can be changed by use of a removable digital storage device, security shall be provided for those parameters as specified in G-S.8.2. For parameters adjusted using other means, the following applies:**

Adequate provision shall be made for an approved means of security (e.g., data change audit trail) or for physically applying a security seal in such a manner that requires the security seal to be broken before an adjustment or interchange may be made of any:

(a) measuring element or indicating element;

(b) adjustable element for controlling delivery rate, when such rate tends to affect the accuracy of deliveries; and

(c) metrological parameter that will affect the metrological integrity of the device or system.

When applicable, the adjusting mechanism shall be readily accessible for purposes of affixing a security seal.

*[Audit trails shall use the format set forth in Table S.2.3. Categories of Device and Methods of Sealing]**
*[*Nonretroactive as of January 1, 1995]*

(Amended 2006 **and 20XX**)

B7: WTR-1 D S.2.1. Provision for Sealing.

Item Under Consideration:
Modify the Water Meters Code as follows:

S.2.1. Provision for Sealing. – **For devices or systems in which the configuration or calibration parameters can be changed by use of a removable digital storage device, security shall be provided for those parameters as specified in G-S.8.2. For parameters adjusted using other means, the following applies:**

Adequate provision shall be made for applying security seals in such a manner that no adjustment or interchange may be made of:

(a) any measurement elements; and

(b) any adjustable element for controlling delivery rate when such rate tends to affect the accuracy of deliveries.

The adjusting mechanism shall be readily accessible for purposes of affixing a security seal.
(Amended 20XX)

B7: MFM-1 D S.3.5. Provision for Sealing.

Item Under Consideration:
Modify the Mass Flow Meters Code as follows:

S.3.5. Provision for Sealing. – **For devices or systems in which the configuration or calibration parameters can be changed by use of a removable digital storage device, security shall be provided for those parameters as specified in G-S.8.2. For parameters adjusted using other means, the following applies:**

Adequate provision shall be made for an approved means of security (e.g., data change audit trail) or physically applying security seals in such a manner that no adjustment or interchange may be made of:

(a) any measuring or indicating element;

(b) any adjustable element for controlling delivery rate when such rate tends to affect the accuracy of deliveries;

(c) the zero adjustment mechanism; and

(d) any metrological parameter that will affect the metrological integrity of the device or system.

When applicable, the adjusting mechanism shall be readily accessible for purposes of affixing a security seal.
*[Audit trails shall use the format set forth in Table S.3.5. Categories of Device and Methods of Sealing]**
*[*Nonretroactive as of January 1, 1995]*
(Amended 1992, 1995, 2006**,** and **20XX**)

B7: CDL-4 D S.2.5. Provision for Sealing.

Item Under Consideration:
Modify the Carbon Dioxide Liquid-Measuring Devices Code as follows:

S.2.5. Provision for Sealing. – **For devices and systems in which the configuration or calibration parameters can be changed by use of a removable digital storage device, security shall be provided for those parameters as specified in G-S.8.2. For parameters adjusted using other means, the following applies:**

Adequate provision shall be made for an approved means of security (e.g., data change audit trail) or for physically applying a security seal in such a manner that requires the security seal to be broken before an adjustment or interchange may be made of:

(a) any measuring or indicating element;

(b) any adjustable element for controlling delivery rate when such rate tends to affect the accuracy of deliveries;

(c) any automatic temperature or density compensating system; and

(d) any metrological parameter that will affect the metrological integrity of the device or system.

When applicable any adjusting mechanism shall be readily accessible for purposes of affixing a security seal.
*[Audit trails shall use the format set forth in Table S.2.5. Provision for Sealing]**
*[*Nonretroactive as of January 1, 1995]*

(Amended 2006 **and 20XX**)

B7: HGM-3 D S.3.3. Provision for Sealing.

Item Under Consideration:
Modify the Hydrogen Gas-Measuring Devices Tentative Code as follows:

S.3.3. Provision for Sealing. – **For devices and systems in which the configuration or calibration parameters can be changed by use of a removable digital storage device, security shall be provided for those parameters as specified in G-S.8.2. For parameters adjusted using other means, the following applies:**

Adequate provision shall be made for an approved means of security (e.g., data change audit trail) or physically applying security seals in such a manner that no adjustment may be made of:

(a) each individual measurement element;

(b) any adjustable element for controlling delivery rate when such rate tends to affect the accuracy of deliveries;

(c) the zero adjustment mechanism; and

(d) any metrological parameter that detrimentally affects the metrological integrity of the device or system.

When applicable, the adjusting mechanism shall be readily accessible for purposes of affixing a security seal. Audit trails shall use the format set forth in Table S.3.3. Categories of Device and Methods of Sealing.

(Amended 20XX)

B7: EVF-1 D S.3.3. Provision for Sealing.

Item Under Consideration:
Modify the Electric Vehicle Refueling Systems Code as follows:

S.3.3. Provision for Sealing. – **For devices or systems in which the configuration or calibration parameters can be changed by use of a removable digital storage device, security shall be provided for those parameters as specified in G-S.8.2. For parameters adjusted using other means, the following applies:**

Adequate provision shall be made for an approved means of security (e.g., data change audit trail) or physically applying security seals in such a manner that no adjustment may be made of:

(a) each individual measurement element;

(b) any adjustable element for controlling voltage or current when such control tends to affect the accuracy of deliveries;

(c) any adjustment mechanism that corrects or compensates for energy loss between the system and vehicle connection; and

(d) any metrological parameter that detrimentally affects the metrological integrity of the EVSE or system.

When applicable, the adjusting mechanism shall be readily accessible for purposes of affixing a security seal. Audit trails shall use the format set forth in Table S.3.3. Categories of Device and Methods of Sealing.

(Amended 20XX)

B7: TIM-1 D S.4. Provision for Sealing.

Item Under Consideration:
Modify the Timing Devices Code as follows:

S.4. Provisions for Sealing. – **For devices or systems in which the configuration or calibration parameters can be changed by use of a removable digital storage device, security shall be provided for those parameters as specified in G-S.8.2. For parameters adjusted using other means,** ~~A~~**a**dequate provisions shall be made to provide security for the timing element.

(Added 2015) **(Amended 20XX)**

B7: GMM-2 D S.2.5. Provision for Sealing.

Item Under Consideration:
Modify Section 5.56.(a) Grain Moisture Meters Code as follows:

S.2.5. Provision for Sealing. – **For devices and systems in which the configuration or calibration parameters can be changed by use of a removable digital storage device, security shall be provided for those parameters as specified in G-S.8.2. For parameters adjusted using other means, the following applies:**

~~P~~rovision shall be made for applying a security seal in a manner that requires the security seal to be broken, or for using other approved means of providing security (e.g., audit trail available at the time of inspection as defined in Table S.2.5. Categories of Device and Methods of Sealing) before any change that affects the metrological integrity of the device can be made to any mechanism.

(Amended 20XX)

B7: MDM-1 D S.1.11. Provision for Sealing.

Item Under Consideration:
Modify the Multiple Dimension Measuring Devices Code as follows:

S.1.11. Provision for Sealing. - For devices and systems in which the configuration or calibration parameters can be changed by use of a removable digital storage device, security shall be provided for

<u>those parameters as specified in G-S.8.2. For parameters adjusted using other means, the following applies:</u>

(a) ~~A~~ **The** device **<u>or system</u>** shall be designed with provision(s) for applying a security seal that must be broken, or for using other approved means of providing security (e.g., data change audit trail available at the time of inspection), before any change that detrimentally affects the metrological integrity ~~of the device~~ can be made to any measuring element.

(b) Audit trails shall use the format set forth in Table S.1.11. Categories of Devices and Methods of Sealing for Multiple Dimension Measuring Systems.

<u>(Amended 20XX)</u>

Background/Discussion:

Note: Agenda Item GEN-2 of this block appeared on the Committee's 2017 agenda as Agenda Item 3600-5 and was titled Appendix D – Definitions: Remote Configuration Capability. All other agenda items in this block are new items that were added in 2018.

The Committee initially considered a proposal from the NTEP Grain Analyzer Sector to modify the definition for "remote configuration capability" as follows:

remote configuration capability. – The ability to adjust a weighing or measuring device or change its sealable parameters from or through some other device that ~~is not~~ **<u>may or may not</u>** itself **<u>be</u>** necessary to the operation of the weighing or measuring device or ~~is not~~ **<u>may or may not be</u>** a permanent part of that device. [2.20, 2.21, 2.24, 3.30, 3.37, 5.56(a)]

(Added 1993, **<u>Amended 20XX</u>**)

The proposal was intended to address the use of removable digital storage devices in grain moisture meters (GGMs). Removable digital storage devices can be used in GMMs as either data transfer devices that are not necessary to the operation of the GMM or as data storage devices which are necessary to the operation of the GMM. If removable data storage devices are necessary to the operation of the device, they are not covered by the current definition of "remote configuration capability" in NIST HB 44.

A USB flash drive is most likely to be used as a data transfer device. In a typical data transfer application considered by the Grain Sector, the USB flash drive is first connected to a computer with access to the GMM manufacturer's web site to download the latest grain calibrations that are then stored in the USB flash drive. The USB flash drive is removed from the computer and plugged into a USB port on the GMM. The GMM is put into remote configuration mode to copy the new grain calibration data into the GMM's internal memory. When the GMM has been returned to normal operating (measuring) mode the USB flash drive can be removed from the GMM.

Although a Secure Digital (SD) memory card could also be used as a data transfer device it is more likely to be used as a data storage device. In a typical "data storage device" application, the SD memory card stores the grain calibrations used on the GMM. The SD memory card must be plugged into an SD memory card connector on a GMM circuit card for the GMM to operate in measuring mode. To install new grain calibrations, the GMM must be turned "off" or put into a mode in which the SD memory card can be safely removed. The SD memory card can either be replaced with an SD memory card that has been programmed with the new grain calibrations or the original SD memory card can be re-programmed with the new grain calibrations in much the same way as that described in the preceding paragraph to copy new grain calibrations into a USB flash drive. In either case, the SD memory card containing the new calibrations must be installed in the GMM for the GMM to operate in measuring mode. In that regard, the SD memory card (although removable) can be considered a permanent part of the GMM in that the GMM cannot operate without it.

Note: In the above example SD memory card could be any removable flash memory card such as the Secure Digital Standard-Capacity, the Secure Digital High-Capacity, the Secure Digital Extended-Capacity, and the Secure Digital Input/Output, which combines input/output functions with data storage. These come in three form factors: the original size, the mini size, and the micro size. A Memory Stick is a removable flash memory card format, launched by Sony in 1998, and is also used in general to describe the whole family of Memory Sticks. In addition to the original Memory Stick, this family includes the Memory Stick PRO, the Memory Stick Duo, the Memory Stick PRO Duo, the Memory Stick Micro, and the Memory Stick PRO-HG.

The Committee heard opposition to the proposed changes to the definition originally proposed by the Grain Sector, though a number of comments indicated support for changes to adequately address security for weighing and measuring systems adjusted using removable media. Over the course of several years, multiple proposals were presented, and the Grain Analyzer Sector decided to address its concerns through implementation of other requirements specific to grain analyzers. Acknowledging the need to modify sealing requirements to better address systems adjusted using removable media, OWM requested the Committee assign responsibility for this item to OWM.

At the 2015 through 2016 Interim and Annual Meetings, OWM provided updates to the Committee on its progress developing this group of items. Mrs. Tina Butcher (NIST OWM) noted that, after analyzing the issue, OWM was concerned that proposing modifications to the existing sealing requirements might have unintended consequences for some equipment not adjusted using this type of media. Since modifications using removable media that would remain in the device during normal use had not been envisioned when the audit trail criteria were originally developed, OWM believes that it might be best to create sealing requirements that apply more specifically to this technology. At the 2015 Annual Meeting, Mrs. Tina Butcher (OWM) reported that members of its Legal Metrology Devices Program (LMDP) developed a draft General Code paragraph they believe will address the sealing of devices using this technology to make adjustments. The LMDP requested that this draft paragraph be included in this item to begin generating feedback to assist in further development of this item and shared the proposed approach with the Committee and NTEP Sectors.

Mrs. Butcher also noted that the LMDP plans to propose modifications to a number of the individual device codes in HB 44 to reference the new General Code sealing requirement and shared an example of such proposed changes in the Scales Code.

OWM also provided updates to the Committee on its progress to further develop this group of items at the 2017 NCWM Interim and Annual Meetings. At the 2017 Interim Meeting, OWM requested, and the Committee agreed, to replace the Grain Analyzer Sector's original proposal with one OWM had completed which included the new proposed General Code paragraph as well as proposed revisions to the sealing requirements in several of the individual device codes to reference the new General Code paragraph being proposed. At the Annual Meeting, OWM requested, and the Committee agreed, to replace the text for paragraph S.1.11.1. to address a concern raised by the SMA involving an industry-accepted definition of "configuration." The definition, according to the SMA, included items that should not be considered sealable.

See the Committee's 2013 – 2017 Final Reports for additional background information and to review the different proposals considered by the Committee to address security of equipment; the metrological parameters of which can be changed by use of some form of removable digital storage device.

During the 2018 NCWM Interim Meeting the Committee received comments on this block of items from Mr. Dmitri Karimov (Liquid Controls) who spoke on behalf of the Meter Manufacturers Association (MMA). Mr. Karimov reported that the MMA believes this is a move in the right direction but may require more work. A prior concern regarding the test that had been proposed has been addressed by OWM's new language.

Mr. Michael Keilty (Endress Hauser Flowtech AG USA) was in opposition stating that this will make current devices using a physical seal illegal. Mr. Keilty has concerns with requiring the memory card being required to be behind the seal.

Mr. Randy Moses (Wayne Manufacturing) commented that he too opposed this item because it did not address Category 2 devices. Mr. Russ Vires (Mettler-Toledo, LLC) speaking on behalf of the Scale Manufacturers Association SMA, opposed the item as written. He stated it was not clear how it affects memory devices. Mr. Louis Straub (Fairbanks Scale) suggested that the revised wording presented by OWM may address many concerns. He encouraged everyone to review the new wording. Mr. Richard Suiter (Richard Suiter Consulting) had concerns about limitations of removable devices, and how the internet would play into this proposal.

During the Committee work session, the members agreed to maintain the Developing status concerning this block of items.

The Committee did not take comments during open hearings on Developing items at the 2018 NCWM Annual Meeting except to grant the submitter of a Developing item (or block of Developing items) an opportunity to provide an update on the progress made to further develop the item(s) since the 2018 NCWM Interim Meeting. OWM, submitter of this block of items, provided the following update:

> The intent of proposed new paragraph G-S.8.2. is to address the sealing of devices and systems adjusted using a removable digital storage device that must remain in the device in order for the device to be operational. The intent of all the other items in this block is to provide an exemption to the existing sealing requirements in each of the device codes being applied when the calibration or configuration parameters are changed using a removable digital device and direct those performing the inspection to paragraph G-S.8.2.
>
> OWM reported in its 2018 Interim Meeting analysis of this block of items that it believed these items were fully developed and ready for vote. Shortly after the 2018 NCWM Interim Meeting, however, OWM received an inquiry from a meter manufacturer asking if connecting a laptop computer via cable to configure a device or system would be considered removable media. It was not OWM's intention that proposed paragraph G-S.8.2. apply in such situations providing the laptop gets disconnected from the device or system once the new configuration and/or calibration parameters have been loaded into memory. The intent is that this paragraph only apply to those devices or systems in which the removable digital storage devices must remain in the device (or system) in order for the device (or system) to be operational. To address this concern and better clarify the application of proposed new paragraph G-S.8.2., OWM revised the paragraph in the weeks leading up to the 2018 NCWM Annual Meeting and provided a copy of the revised version to the Committee. OWM requested that the Committee replace the existing paragraph in the Item under Consideration for Block 7 Item Gen-2 with the revised version.

In written comments to the Committee, the SMA reported it looks forward to further information on these items. The SMA appreciates the clarification of the metrological configuration parameters and the addition of a physical seal provision.

During the Committee's work session, members of the Committee agreed that the amended version of paragraph G-S.8.2. offered by OWM to address the concern raised by a meter manufacturer clarified the proposed requirement. Consequently, the Committee agreed to OWM's request to replace the existing proposed paragraph G-S.8.2. with the amended version made available by OWM and as shown in Item under Consideration for this item. No other changes were made to any other item in this block and members of the Committee agreed they believe the items in this block are fully developed and should be presented for vote in the 2019 NCWM Conference cycle. Refer to the Committee's 2018 Interim Report to view the version of paragraph G-S.8.2. that was replaced by the Committee at the 2018 NCWM Annual Meeting.

Regional Association Comments:
At its fall 2017 Annual Meeting, the WWMA agreed with the submitter that this item is fully developed and recommended it be moved forward to the National Committee as a Voting item as proposed.

At SWMA's fall 2017 Annual Meeting, the Committee heard comments from Mrs. Tina Butcher (NIST OWM), the submitter of the item. Mrs. Butcher noted that OWM took on the responsibility for this item after initial work done by the NTEP Grain Sector. OWM provided the recommendations in this item to the S&T Committee at the 2017 Annual Meeting with a recommendation that it replace the Item under Consideration and be forwarded to the regional meetings for consideration in the upcoming cycle. The proposal recommends establishing a new paragraph in the General Code to address devices that are adjustable through use of removable digital media such as SD cards and flash drives. The proposal also recommends the addition of paragraphs in specific device codes which refer to the General Code paragraph for devices that are adjusted in this manner. This approach would, hopefully, eliminate potential conflicts with device types that are covered under existing sealing requirements and enable the current definition for "remote configuration capability" to remain intact. Mr. Russ Vires, speaking on behalf of SMA, noted that SMA has not met since the most recent recommendations presented by the submitter. Thus, SMA has no comments at this point, but will review the proposed changes at its fall meetings and provide input at that time. The Committee received no other comments on this item. The Committee noted the title of the item needs to be changed to reflect the proposals submitted to the NCWM S&T Committee in July 2017. The SWMA recommended that this item be presented for a vote.

There being no comments on this item at the spring 2018 CWMA Annual Meeting, the CWMA reported it agrees with NIST that this item is ready for voting at the next NCWM cycle. To address a concern raised after the 2018 NCWM Interim Meeting by a meter manufacturer, OWM commented it plans to develop additional clarifying language for proposed new paragraph G-S.8.2. This language is intended to make clear that paragraph G-S.8.2. is not intended to apply to a portable external device attached to a weighing or measuring device or system to change the configuration or calibration parameters.

At NEWMA's spring 2018 Annual Meeting, the SMA commented it looks forward to further information on these items. Previously there were questions on whether or not a laptop computer would be classified as a removable digital storage device. Updates by the submitter specify that the removal digital storage device must remain in the device in order for the device to be operational. NEWMA believes this item is making progress and recommends it continue to be developed.

Additional letters, presentations, and data may have been submitted for consideration with this item. Please refer to **www.ncwm.com/interim-archive** to review these documents.

GEN – GENERAL CODE

GEN-3 A G-A.1. Commercial and Law-Enforcement Equipment. and G-S.2. Facilitation of Fraud.

(This item was Assigned)

Source:
Arizona, Florida, Maine, Michigan and Cambridge, Massachusetts (2018)

Purpose:
To prevent access and tampering by unauthorized persons to any area of the device where electronic financial transactions occur, credit card information is obtained, and or personal information is stored or transmitted.

Item under Consideration:
Amend NIST Handbook 44 General Code as follows**:**

G-A.1. Commercial and Law-Enforcement Equipment. – These specifications, tolerances, and other technical requirements apply as follows:

(a) To commercial weighing and measuring equipment; that is, to weights and measures and weighing and measuring devices commercially used or employed in establishing the size, quantity, extent, area, composition (limited to meat and poultry), constituent values (limited to grain), or measurement of quantities, things, produce, or articles for distribution or consumption, purchased, offered, or submitted for sale, hire, or award, or in computing any basic charge or payment for services rendered on the basis of weight or measure.

(Amended 2008)

(b) To any accessory attached to or used in connection with a commercial weighing or measuring device when such accessory is so designed that its operation affects the accuracy **<u>or can be used to defraud or collect unauthorized personal or financial information from the user</u>** of the device.

(c) To weighing and measuring equipment in official use for the enforcement of law or for the collection of statistical information by government agencies.

G-S.2. Facilitation of Fraud. – All equipment and all mechanisms, software, and devices attached to or used in conjunction therewith shall be so designed, constructed, assembled, and installed for use such that they do not facilitate the perpetration of fraud. **<u>Any device capable of customer initiated electronic financial transactions shall incorporate an event counter that records date and time of access and must be of such design and construction to substantially restrict access and tampering by unauthorized persons to any area of the device where financial transactions occur, credit card information is obtained, and or personal information is stored or transmitted. Restriction of access and tampering may be accomplished by;</u>**

<u>(a) Electronic alarming or disabling of the equipment if unauthorized access is gained or,</u>

<u>(b) Physical means that cannot be breached without causing visible damage to the exterior of the device. Such physical means shall not include the use of a universal key, master key or security device that can be manipulated with universal tools.</u>

(Amended 2007 **and 20XX**)

Background/Discussion:
Given the potential financial impact to consumers and credit issuing companies weights & measures jurisdictions recognizes the need to offer more protection to both buyer and seller in these transactions. The current design of these devices offers little to no barrier to fraud through theft of credit information. As such, it is our belief that the current design, in most cases, already violates G.S.2. by facilitating easy access to allow installation of these fraudulent card reading devices. Therefore, in our opinion, stronger means must be implemented to decrease the potential for fraudulent activity with these devices.

The Florida Department of Agriculture and Consumer Services estimates that, on average, each skimmer results in 100 counterfeit cards, each of which are used to make $1,000 in fraudulent purchases. In other words, a single skimmer typically leads to $100,000 in theft. This is a nationwide problem that causes millions of dollars in fraudulent charges to consumers, device owners, and banking institutions each year. A solution can be achieved through upgraded security measures on the weighing and measuring devices that fall within the guidelines of HB 44.

One possible argument is that these preventative measures should be in User Requirements instead of in Specifications, but this is intended to be a long-term solution. The State of Florida has enacted legislation to require device users to add security measures. They have found that most owner/operators have chosen to use security seals or non-standard locks on the dispensers and that 85% of the skimming equipment being found is in devices with user applied security measures. User-applied security measures are not as effective as electronic security and/or unique, tamper proof locks.

Manufacturers of these devices may argue that the cost to make the necessary upgrades will be prohibitive. This item is not intended to be retroactive and the cost of the additional security measures will be universal and not place any manufacturer at a competitive disadvantage. Several manufacturers of electronic security systems designed for retail motor fuel dispensers have products available and at least three new manufacturers of low-cost systems have recently come into the marketplace (at least one of them is working with OEM manufacturers and the security systems are being integrated into newly manufactured dispensers).

During the 2018 NCWM Interim Meeting, the Committee heard comments from Mr. Russ Vires (Mettler-Toledo, LLC), speaking on behalf of the SMA. Mr. Vires stated that the SMA supported the item but recommended a Developing status. Mr. Vires questioned the definition of the term “access” and questioned if the term means that it required keys or other tools to access the device.

Mr. Dmitri Karimov (Liquid Controls) stated he opposed the item.

Mr. Kurt Floren (Los Angeles County, California) commented he opposed the item. Placing the language in the General Code would weaken the existing language already in place. He does not believe it is a weights and measures issue.

Mr. Gordon Johnson (Gilbarco Inc.) commented he opposed the item. He is confused on how Gilbarco would satisfy the specification. Should this be user requirement? Mr. Constantine Cotsoradis (Flint Hills Resources) commented the language is too broad. If the requirement is not retroactive, the device owner should be responsible.

Ms. Kristin Macey (California) is concerned about the misapplication of the word "user." She feels the new language should be a separate paragraph and they have same language in California.

Mr. Hal Prince (Florida) stated this item was submitted from jurisdictions from all four of the regional weights and measures associations. He submitted a letter for support. He recommended the item be Informational at minimum, if not voting.

Mr. Richard Suiter (Richard Suiter Consulting) mentioned several devices subject to being skimmed. He agreed something needs to be done but is not sure the item is ready. He will support making this item a Developing or Informational item. He said he believes many stakeholders outside of weights and measures should have input.

Ms. Paige Anderson (National Association of Convenience Stores) mentioned there are over 160 million transactions per day.m She agreed there is a need for something but is not sure the item is ready. She believes other groups should get involved also.

Ms. Fran Elson-Houston (Ohio) stated some counties do not want to be involved while other counties inspect specifically for skimmers. The State of Ohio feels skimmers should be looked for during routine inspections.

Mr. Mike Sikula (New York) has conducted training on finding skimmers since 2015. Weights and Measures will look for skimmers and will call law enforcement officials if one is found. He believes other stakeholders should be involved with the process. He reviewed this item with law enforcement officials and those officials felt they should be involved.

Mr. Scott Mason (Phillips 66) agreed it is a good idea but not ready for voting. He mentioned others have not been consulted, including banks and credit card companies.

Ms. Linda Toth (Conexxus) stated the item is not ready and recommended designating the item as Informational.

Mr. Randy Moses (Wayne) stated it needs to be discussed with banks and credit card companies since they already deal with this issue. He doesn't feel weights and measures needs to go off in its own direction with this.

Mr. Jimmy Cassidy (City of Cambridge, Massachusetts), one of the submitters of the items, recommended the items be given a status of Informational or Assigned. He believes we need something to move forward and it should be included in the General Code to extend beyond gas pumps.

Ms. Michelle Wilson (Arizona) said the problem is increasing and not going away. She recommended a focus be placed on new devices and requirements be made non-retroactive. She recommended moving the item forward as Informational.

Mr. Gordon Johnson (Gilbarco) feels the pain when working with other agencies or stakeholders. Gilbarco is ready to work with the NCWM, banks, and credit card companies. He noted all the stakeholders need to be at the table.

During the Committee work session, Committee members discussed the comments heard both in favor of and opposition to the item. Comments included involving more stakeholders on the development of the item. Members also asked if the item should be considered a weights and measures issue. The Committee agreed to recommend giving this item an Assigned status and requesting the formation of a task group. A letter of request was sent to the NCWM Chair.

The Committee suggests the task group be comprised of stakeholders, including individuals from convenience store associations; meter manufacturers; retailers; petroleum marketers associations; weights and measures regulators (one from each region); and NIST.

At the 2018 NCWM Annual Meeting the Committee received an update on this item from the Chairman of the NCWM Skimmer Task Group, Mr. Hal Prince (Florida). Mr. Prince reported work is ongoing on this item and the TG has been meeting bi-weekly since May 2018. Much of the TG discussion has revolved around two key questions:

1. Is this a weights and measures issue that NCWM should take on?

2. If so, does weights and measures have the authority to require manufacturers and users of commercial weighing and measuring equipment to take whatever steps needed to ensure such equipment prevents unauthorized access to nonmetrological changes to the equipment?

Mr. Prince further reported members of the TG were recently surveyed and asked these questions, but results are not yet available. It is hoped more information will be available to report at the next 2019 NCWM Interim Meeting.

Mr. Prince also stated more members and stakeholders are needed for the TG. Members of the TG believe that weights and measures agencies need an educational component (e.g., an outreach program) set up for law enforcement and consumers and perhaps needs a "best practice guide" to be developed.

Regional Association Comments:
At its fall 2017 Annual Meeting, the WWMA recommended this item be continued as a Developing item. The WWMA believes the item has merit; however, would like to see a definition of "access;" that is, what constitutes access? In addition, what are the definitions of "master key," "universal key," and "universal tools?" The WWMA is also concerned that with this item being included in the General Code, it is very broad in the devices that will be affected by this code change, and the WWMA feels industry needs time to vet the item in addition to an OWM review. We also recommend the submitter consider the addition of a user requirement requiring the owner/operator to utilize the security features of the device. There was also a concern that this item was included under "Facilitation of Fraud" in G-S.2. because that code requirement is generally understood to be facilitation of fraud by an owner/operator rather than someone trying to gain customer information through a skimming device installed outside of the owner/operator's knowledge.

At the fall 2017 SWMA Annual Meeting, it was reported some felt that the issue may not address metrological functions and, therefore, questioned whether it falls under weights and measures jurisdiction. Others pointed out there are other items addressed by NIST Handbook 44 which do not speak to metrologically significant functions or features. The SWMA S&T Committee heard multiple comments indicating concerns about this issue and the need for these devices to be addressed. The SWMA S&T Committee believes that the item has merit. Consequently, based on the comments received, the Committee felt like this item needed additional input and development. However, after considering additional comments during the SWMA voting session, including comments from the submitter questioning what additional work would be needed, the SWMA S&T Committee decided to change the status of this item to Voting and the SWMA agreed to recommend it be designated a Voting item on NCWM's agenda.

The CWMA, at its fall 2017 Interim Meeting, recommended further development of this item. In its Interim report, the CWMA S&T Committee noted Cardinal Scale opposed the item as written but would be open to further clarification on the methods of security (Keys). Additionally, Rice Lake Weighing Systems questioned whether this falls under the scope of HB 44 because this is a security issue and not a metrological issue. At its spring 2018 Annual Meeting, the CWMA did not solicit comments because at the 2018 NCWM Interim Meeting, the NCWM S&T Committee agreed to recommend this item be assigned to a Task Group. The CWMA looks forward to more information on the pending formation of an assigned group.

At the fall 2017 NEWMA Interim Meeting, Mike Sikula (New York State) supported the item, but was concerned the restriction of access to prevent criminals from planting skimming devices and would also prevent inspectors from easily accessing devices. Mr. Frank Green (Connecticut) added his concern to make sure access is still possible for weights and measures officials. Mr. Eric Golden (Cardinal Scales Manufacturing) questioned what lock is good enough in this situation. Mr. Walt Remmert (Pennsylvania) suggested there needs to be more people in the discussion to standardize the situation by protecting and granting access to W&M. Mr. Steve Giguere (Maine, submitter) stated this was proposed for the General Code intentionally so as to encompass all devices. Mr. Ross Andersen (NY, retired) questioned whether weights and measures has authority for this. Mr. Sikula interpreted G-A.1. (b), as written, to mean weights and measures officials are responsible for the fraud investigation. The NEWMA S&T Committee reported it believes the submitters have developed the item and NEWMA recommended it move forward as an Informational item. At the spring 2018 NEWMA Annual Meeting, the SMA commented that it opposes the item and recommends withdrawal due to the topic not being within the scope of Weights and Measures. Another comment was heard supporting the SMA's position. NEWMA also heard that weights and measures should provide some enforcement, but that it should be done through different regulations. NEWMA recommended this remain as an Assigned item at this time to give the TG an opportunity to develop this further.

Additional letters, presentations, and data may have been submitted for consideration with this item. Please refer to **www.ncwm.com/interim-archive** to review these documents.

SCL – SCALES

SCL-6 V S.1.2.2.3. Deactivation of a "d" Resolution

(This item was Adopted.)

Source:
NIST OWM (2018)

Purpose:
To ensure that a Class I or II scale with the capability of deactivating a "d" resolution continues to round properly when the "d" resolution is deactivated.

Item under Consideration:
Amend NIST Handbook 44, Scales Code as follows:

> **S.1.2.2.3. Deactivation of a "d" Resolution. - It shall not be possible to deactivate the "d" resolution on a Class I or II scale equipped with a value of "d" that differs from "e" if such action affects the scale's ability to round digital values to the nearest minimum unit that can be indicated or recorded as required by paragraph G-S.5.2.2.**
>
> **(Added 2018)**

Background/Discussion:
In researching a proposal adopted by the NCWM in 2017 (the addition of Scales Code Paragraph S.1.2.2.2. Class I and II Scales Used in Direct Sales), NIST OWM discovered there have been cases in which a Class I or II scale has the provision for deactivating its displayed division "d" and, in doing so, it affected the ability for the scale to round properly. Because this rounding functionality may not be readily detected in the field, OWM is proposing a specific paragraph be added to address this concern. Having a specific requirement in the Scales Code may help manufacturers avoid costly mistakes when designing a new model of scale and may help encourage clear and understandable transactions for buyer and seller.

Rather than delaying the adoption of Paragraph S.1.2.2.2. in 2017, OWM proposed submitting this follow-on proposal in the 2017-2018 NCWM cycle to address concerns identified by the S&T Committee. The S&T Committee was supportive of OWM's plan to do so.

Additional background information is provided below for reference.

Historically, Class I and II scales have been used in indirect sale applications or in direct sale applications where the buyer and seller are familiar with the weighing process and associated displays. With the increased use of Class I and II scales in direct sale applications for the sale of cannabis, weights and measures jurisdictions have reported that buyers and sellers are often confused over which increment is to be used as the basis for the transaction. That is, whether the display of the verification scale interval "e" is to be used or if the finer displayed division "d" is to be used.

In response to these concerns, in July 2017 the NCWM adopted a new paragraph under S.1.2.2. Verification Scale Interval (S.1.2.2.2. Class I and II Scales Used in Direct Sales) to require that the displayed division "d" and the verification scale interval "e" be the same. There are multiple ways in which a manufacturer can address this new requirement. For example, a scale might be designed to display only a single size of increment. As another example, a scale might be designed with a sealable feature for accessing a menu where multiple options for selecting the displayed increment can be selected, including a single increment to comply with this requirement for direct sales or both a "d" and "e" increment for applications in which the scale is used in other than direct sale applications. A third possibility is to design the scale that displays both a "d" and "e" with the option of "deactivating" the "d."

In the process of researching this proposal, NIST OWM discovered that there have been instances in which the latter option has been found. In these cases, the deactivation of the displayed division "d" resulted in the scale simply truncating its values. While it is possible that this might be discovered in routine field testing, it is more likely to be overlooked because most field officials are not testing digital scales using error weights to determine the exact amount of error. Consequently, a "round off" problem would not likely be detected. Additionally, field standard test weights in denominations small enough to use as error weights for testing Class II scales may not be readily available in the marketplace. There are General Code requirements that could be used to address improper rounding (e.g., General Code Paragraph G-S.2. Facilitation of Fraud), but these are broad and may not provide a manufacturer with enough specificity or guidance during the design phase of scale production. While the deactivation of "d" as an option is not itself inappropriate, it is not appropriate if the deactivation affects the ability of the scale to round properly.

While one current manufacturer of Class I and II balances doesn't provide the option for deactivating the displayed division "d," without a specific requirement to prohibit deactivating the "d" (when it affects rounding functionality), manufacturers designing new scales may not be aware of the concern.

There are General Code requirements that might be used to require that a scale properly round under any condition of use. However, the requirements are broad, and the improper rounding functionality may be difficult to detect in routine field testing.

OWM contacted a representative of one current manufacturer of Class I and II scales who reported that his company's scales do not provide the feature for deactivating the displayed division "d;" the display of a single increment is addressed through the offering of a separate model of scale. It is not clear whether other manufacturers currently design their scales (or might design them in the future) to offer the "deactivation" feature and, if so, whether the feature would result in improper rounding

See also Item 3200-2 S.1.2.2. Verification Scale Interval in the NCWM S&T Committee's 2017 Interim and Final Reports.

At the 2018 NCWM Interim Meeting, the Committee heard comments from Mr. Russ Vires (Mettler-Toledo, LLC) speaking on behalf of the SMA. Mr. Vires reported that the SMA takes no position on the item at this time. The SMA believes the requirement is already covered in Handbook 44.

Hearing no additional comments and considering the submitter could not be attendance due to items outside of their control, the Committee felt it appropriate to assign the item a Voting status.

At the 2018 NCWM Annual Meeting, the Committee received several comments on this item.

Mr. Russ Vires (Mettler-Toledo) speaking on behalf of the SMA, commented that the SMA believes this is already covered in HB 44. SMA takes no position on this item.

Mr. Rick Harshman (NIST OWM) reported OWM had learned that some Class I and Class II scales equipped with different values of "d" and "e" will not round properly (i.e., to the closest value of "e") if the "d" value is disabled (turned off). Instead, some scales will truncate the fractional values between scale intervals being displayed when "d" is disabled. Mr. Harshman noted that while OWM acknowledged paragraph G-S.5.2.2. addresses rounding of digital values, OWM's rationale for proposing the new paragraph is to make officials and service personnel aware of this possible rounding issue on some scales.

Additional comments heard by the Committee on this item were somewhat mixed. One regulatory official noted that the testing required to confirm if such scales are rounding properly could not easily be performed in the field and should, therefore, only be part of an NTEP evaluation. Another official reported finding the "d" value being used to establish the basis for commercial transactions on scales being used within the state and said he believes the item would help with clarification. It was also suggested by a retired state official that NTEP certificates be re-evaluated should it be determined that disabling the "d" resolution causes a scale to round improperly.

During the Committee's work session, members of the Committee agreed HB 44 paragraph G-S.5.2.2. already addresses proper rounding of digital values. There was also a general consensus amongst Committee members that adding the new paragraph would be beneficial because the rounding problem isn't thought to be universal to all Class I and Class II scales equipped with different values of "d" and "e." For this reason, the Committee agreed to present the item for vote.

Regional Association Comments:
At its fall 2017 Annual Meeting, the WWMA reported it believes that this item has merit and is sufficiently developed to be a Voting item.

No comments were heard on this item during the SWMA's fall 2017 Annual Meeting and the SWMA recommended it be voting as presented.

There were no comments received on this item by the CWMA's S&T Committee during the fall 2017 CWMA Interim Meeting and the CWMA recommended the item go forward as a Developing item. At the CWMA's spring 2018 Annual Meeting, the SMA reported it believes the requirements for this item are already covered in NIST HB 44, and therefore takes no position. OWM commented there could be a problem if "d" is disabled by a distributor or manufacturer. The CWMA believes this item is ready for vote.

During NEWMA's fall 2017 Interim Meeting, comments were heard concerning how to verify a scale is meeting code requirement for rounding. Such testing would require the use of 10 mg or 1 mg weights. This does not seem like a realistic field test. The NEWMA S&T Committee reported it believes this has been developed by the submitter and further development should be done by the NCWM S&T Committee. This item has support and NEWMA recommended it move forward on the NCWM agenda as an Informational item. At NEWMA's spring 2018 Annual Meeting, the NIST Technical Advisor explained that OWM believes this is a necessary addition to make officials and others aware of possible round-off errors. The SMA took no position on this item and believes the requirements are already covered in NIST HB 44. NEWMA reported it believes this item is developed and recommended it be forwarded for a vote.

Additional letters, presentations, and data may have been submitted for consideration with this item. Please refer to **www.ncwm.com/interim-archive** to review these documents.

SCL-7 A S.1.8.5. Recorded Representations, Point of Sale Systems

(This item was Assigned)

Source:
Kansas and Minnesota (2017)

Purpose:

Provide consumers the same opportunity, to be able to easily verify whether or not tare is taken on items weighed at a checkout stand using a POS system, which is currently afforded them when witnessing items being weighed and priced in their presence using other scales in the store.

Item under Consideration:
Amend NIST Handbook 44, Scales Code as follows:

S.1.8.5. Recorded Representations, Point-of-Sale Systems. – The sales information recorded by cash registers when interfaced with a weighing element shall contain the following information for items weighed at the checkout stand:

(a) the net weight;[1]

(b) the unit price;[1]

(c) the total price; and

(d) the product class or, in a system equipped with price look-up capability, the product name or code number.

(e) the tare weight[1]
[Non-retroactive January 1, 2022]
(Amended 20XX)

[1] For devices interfaced with scales indicating in metric units, the unit price may be expressed in price per 100 grams. Weight values shall be identified by kilograms, kg, grams, g, ounces, oz, pounds, or lb. *The "#" symbol is not acceptable.*
[Nonretroactive as of January 1, 2006]
(Amended 1995 and 2005)

Background/Discussion:

Note: This agenda item appeared on the Committee's 2017 agenda as Agenda Item 3200-3.

This proposal would benefit consumers by enabling them to see at a glance that tare is being taken on the commodities they purchase. It would also educate the public about tare and make them better and more aware consumers.

Retailers would benefit because this proposal would aid their quality control efforts behind the counter and at the cash register. Retailers would be able to see that their employees are taking tare on packages, and that the tare employees take is the appropriate tare. For example, a meat manager would be able to spot packages of 1 lb hamburger which had been packaged on the night shift mistakenly used the tare for family packs of chicken, just by walking down the meat counter and noticing a 0.06 lb tare on a package size that would normally have a 0.02 lb or 0.03 lb tare. The manager could also spot a 0.03 lb tare on packages that should have a 0.06 lb tare. Either way, the manager would be able to remove the items from the shelf and make corrections before the store or its customers were harmed. The manager would also be able to re-educate the employees responsible for the error. This improved quality control and transparency would build consumer confidence in retailers' establishments. It might even reduce the time and disruption retailers experience from official package inspections.

Package checking inspections potentially could be reduced because weights and measures officials could make risk-based assessments on the need to do package checking inspections at any given location. If an official notes that gross weights or tares are visible on all random-weight packages and that the tares seem appropriate to the package sizes, the official may be able to skip that location and focus package checking efforts on locations where tares are absent or seem inappropriate for the package sizes. That would be more efficient for both retailers and weights and measures jurisdictions.

Finally, this proposal would aid weights and measures officials investigating complaints about net contents of item by creating written proof of how much tare was taken on a given package or transaction.

Scale manufacturers will need to modify software and label and receipt designs before the non-retroactive date. Retailers with point of sale systems and packaging scales may feel pressured to update software or purchase new devices in response to consumer demand for tare information on labels and receipts. The amount of paper needed to print customer receipts may increase depending on the formatting of the information and the size of the paper being used. Some retailers may not want consumers to have this information as it will allow consumers and weights and measures officials to hold them accountable and would be written proof tare was not taken when, and if, that happens.

When this item was first submitted, it proposed changes to Scales Code paragraphs S.1.8.5. Recorded Representations, Point of Sale Systems and the addition of a new Scales Code paragraph S.1.9.3. Recorded Representations, Random Weight Package Labels. At the 2017 NCWM Interim Meeting, the Committee agreed to split the item into two separate items (Item 3200-3A and 3200-3B) based on a recommendation by one of the co-submitters of the item. Once split, Item 3200-3A contained only the portion of the original item that proposed changes to existing Scales Code paragraph S.1.8.5. Recorded Representations, Point of Sale Systems. Item 3200-3B contained only the portion of the original item that proposed a new paragraph S.1.9.3. be added to the Scales Code. During open hearings, the Committee received numerous comments in support of amending Scales Code paragraph S.1.8.5., some of which proposed additional changes to those originally proposed by the submitters of the item and advancing the item forward as a voting item. The Committee also received numerous comments in opposition to adding new paragraph S.1.9.3. to the Scales Code as proposed by Item 3200-B. Based on the comments received at the 2017 NCWM Interim Meeting, the Committee agreed to amend the proposal in Item 3200-3A and designate it a Voting item and to eliminate item 3200-3B from its agenda.

At the 2017 NCWM Annual Meeting, Item 3200-3A was presented for vote, but the item failed to receive enough votes to pass and was subsequently returned to Committee. See the Committee's 2017 Final Report for additional details and to view the proposal that was presented for vote at the 2017 NCWM Annual Meeting.

Shortly following the 2017 NCWM Annual Meeting, the Committee received a request from Kansas and Minnesota (two of the three original submitters of the item) to amend the proposal in an attempt to better clarify that "the tare weight" portion of the information to be included on the receipt is proposed as being "nonretroactive." That is, the "tare weight" information on items weighed at a checkout stand would be required to be recorded on the receipts generated from POS systems that meet any of the four conditions specified in paragraph G-A.6. Nonretroactive Requirements as of the effective date of the requirement. To make more evident that the changes proposed to paragraph S.1.8.5. are to be nonretroactive, the two co-submitters proposed repositioning item (b) in the list of information required to be printed to (d), so that "the tare weight" portion of the information required would appear at the very bottom of the list and directly above the nonretroactive date proposed. The two co-submitters also requested that the enforcement date specified in the original proposal be extended an additional two years (i.e., until 2022) in consideration of some of the concerns raised by FMI and other industry representatives during the Committee's open hearings relating to the cost of implementation and the burden the changes would impose on grocery businesses having to comply with them. Extending the effective date of enforcement an additional two years would allow the cost of implementation to be spread over a longer period. A final suggested change was to amend the "Purpose" section of the item in the Committee's agenda to better reflect the true intent of the proposal; that is, to provide consumers the same opportunity afforded them by other scales used for direct sales (e.g., retail-computing scales used to fill customer orders for items weighed at a delicatessen) to be able to easily recognize that a tare deduction for packaging material, etc., is taken on items weighed in their presence. The State of Wisconsin (third co-submitter of the original item) upon being contacted by Kansas and Minnesota and asked to consider these changes, reported that it wished to bow out of further involvement with the item.

The Committee, in considering the changes proposed to the item and the rationale provided by the co-submitters for requesting them, concurred they were appropriate. Consequently, the Committee agreed to amend the proposal as shown in the Item under Consideration and replace the text in the "Purpose Section" of the item on the Committee's agenda.

During the 2018 NCWM Interim Meeting, the Committee heard from Mr. Loren Minnich (Kansas) who commented that the item will benefit consumers and asked the Committee to move the item forward as a Voting item.

Mr. Russ Vires (Mettler-Toledo, LLC) speaking on behalf of the SMA reported the SMA opposes the item. The SMA feels that since regulators verify tare values in POS systems are accurate, the changes proposed would provide little or no benefit to the consumer.

Ms. Fran Elson-Houston (Ohio) commented that she personally supports the item; however, even with the change to the non-retroactive date, she still hears opposition from stakeholders. She also commented that field officials should be verifying the accuracy of programmed tare values. For these reasons she cannot support the item.

Mr. Ken Ramsburg (Maryland) commented that several POS devices already provide tare information on the printed receipt. He supports the item.

Ms. Julie Quinn (Michigan) noted a tare value is dynamic and changes often. Consequently, inspection of programmed tare values is insufficient because a programmed tare value may not be the value used during the transaction. She recommended that the item be presented as a Voting item.

Mr. Mike Sikula (New York) stated he opposes the item and feels it will cause confusion to the consumer.

Mr. Minnich (Kansas) commented that more grocery store transactions are moving to internet sales where the consumer is not present. This proposed change would give officials another piece of information when performing packaging. Mr. Minnich asked the Committee to move the item forward as a Voting item.

The Committee received letters from the South Carolina Retail Association, the Florida Retail Federation, and the North Carolina Retail Merchants Association, all stating their opposition to the item and a recommending it be withdrawn.

The Committee also received a written recommendation asking the Committee to consider modifying the proposal to: (1) require the tare weight and/or the gross weight be printed on the receipt; (2) clarify printed weight values must be clearly and definitely identified as gross, tare, and/or net weights (as required by the General Code); and (3) move text currently in a footnote to the paragraph into the body of the paragraph for ease of reference.

During the Committee's work session, the Committee members reviewed all information received and agreed to move the item forward as a Voting item without change.

At the 2018 NCWM Annual Meeting, the Committee received numerous comments on this item suggesting additional work is needed to further develop the proposal and recommending the formation of a new task group made up of regulatory officials, food marketing representatives, POS software programmers, NIST, and others.

Two of the original submitters of the item, Ms. Quinn and Mr. Minnich, spoke in favor of assigning the item to a work group; one noting that the complexities of packaging are more involved today than first realized indicating the need for this proposal to be looked at more in depth. Ms. Elston-Houston commented that she too supported assigning the item to a TG. Mr. Ramsburg commented that Maryland has always performed tare inspections at the front checkout of grocery stores to verify proper tare has been programmed into these systems. He further noted two of the larger grocery store chains already have this feature (tare values recorded on the receipt). He was in favor of presenting the item for vote.

Mr. Harshman commented that OWM agrees additional information needs to be made available to customers for items weighed on a scale interfaced with a cash register in a POS system and that more work is still needed to develop the proposal. OWM supports the recommendations to assign it to a work group for further revision in hopes that a compromise proposal between industry and regulators could be agreed upon to advance this item. Mr. Harshman also provided an overview of some of the research OWM had completed on the proposal; the outcome of which, in OWM's opinion, suggested there may be other alternatives to providing additional customer information that's needed rather than requiring it be recorded on the sales receipt. He noted that within OWM's 2018 Annual Meeting analysis of this item, OWM provides some additional thoughts on how additional information might be made available to customers and operators of POS scale systems to possibly help form a starting foundation for discussion by members of an assigned work group. OWM's 2018 Annual Meeting Analysis of all items on the S&T agenda is posted on NCWM's website for the 2018 Annual Meeting.

Ms. Elizabeth Tansing (Food Marketing Institute) stated that stores also want equity in the marketplace. The grocery industry is very competitive, and the current proposal would be extremely costly to implement. Noting that each grocery store chain typically designs its own POS system, including the layout of information that gets displayed to customers and store cashiers, Ms. Tansing said that implementing the changes proposed by this item would necessitate a software change to practically every register in each store. She also stated that she supported the suggestion to assign this item to a work group and that she would be willing to participate as a member of that WG to develop language fair to all parties.

Mr. Jon McCormick (Retail Growers Assoc. - Kansas) commented he opposes the item and noted he receives very few complaints on this issue from member stores of the Association. He encouraged weights and measures jurisdictions to increase fines for insufficient tare rather than change current requirements for POS systems.

The Committee also received numerous written letters from the grocery store industry opposing the item to include: the North Carolina Retail Merchants Association, Florida Retail Federation, South Carolina Retail Association, FMI, and others, requesting that the Committee withdraw it.

In consideration of the number of comments received in support of this item being further developed by a work group, the Committee agreed to recommend the item be assigned to an NCWM Task Group. The Committee also agreed the goal of the TG should be to determine how to provide consumers (and operators) with the information necessary, whether on a receipt or displayed on the POS system itself, to verify charges for items weighed at checkout are based on net weight, similar to the opportunity provided them by retail-computing scales used in direct sale applications.

The TG should include representatives from the retailer sector, scale manufacturers, regulators, POS software developers, and if possible, packaging manufacturers, and OWM.

Regional Association Comments:
At its fall 2017 Annual Meeting the WWMA recommended this item, as shown below, be forwarded to as an Information item:

> **S.1.8.5. Recorded Representations, Point-of-Sale Systems** – The sales information recorded by cash registers when interfaced with a weighing element shall contain the following information for items weighed at the checkout stand:
>
> (a) the net weight;[1]
>
> (b) the unit price;[1]
>
> (c) the total price; and
>
> (d) the product class or, in a system equipped with price look-up capability, the product name or code number.
>
> **<u>(e)</u>** ***<u>the tare weight[1]</u>***
> ***<u>[Non-retroactive January 1, 2022]</u>***
>
> **<u>(Amended 20XX)</u>**

At the SWMA's fall 2017 Annual Meeting, Mrs. Tina Butcher (NIST OWM) noted that the title of the item in the Appendix to the Committee's report still includes a reference to a part of the original proposal which would have required the tare weight to be printed on random-packed products. That portion of the proposal was removed from the proposal prior to the 2017 NCWM Annual Meeting. In addition, she noted that the submitters of the item made modifications to the proposal following the 2017 Annual Meeting. The modifications recommend extending the nonretroactive date to 2022 (rather than 2020) and moving the reference to "tare weight" to the last item in the list.

There were also some comments indicating the existence of some confusion concerning the purpose of the proposal and what specifically is being recommended. The SWMA S&T Committee heard multiple comments, both in support of and in opposition to, the proposal. Consequently, the SWMA recommended the item for a vote to allow the membership to decide.

At the CWMA's fall 2017 Interim Meeting, the SMA opposed this item due to the implementation costs to the manufacturers, retailers, and consumers. Iowa stated it supported the item as previously proposed, excluding the non-retroactive date. The CWMA reported it believes this item has been fully developed and should be moved to a vote. At the spring 2018 CWMA Annual Meeting, the two submitters of this item (KS and MN) requested the status be changed from Voting to Assigned and that further development of the item be completed by an NCWM TG. The submitters also reported they prefer the TG be comprised of all interested parties. Based on comments heard by the submitters, the CWMA agreed to recommend the NCWM S&T Committee assign this item to a TG.

NEWMA recommended this item move forward as an Information item at its fall 2017 Interim Meeting upon NEWMA's S&T Committee receiving comments, both in support of, and opposition to, the item. At its spring 2018 Annual Meeting, NEWMA recommended the item be withdrawn, noting a lack of support and after receiving several comments in opposition, including those from the SMA. NIST believes the compliance this item aims to achieve could be accomplished in a separate manner.

Additional letters, presentations, and data may have been part of the Committee's consideration. Please refer to **www.ncwm.com/interim-archive** to review these documents.

SCL-8 A Sections Throughout the Code to Include Provisions for Commercial Weigh-in-Motion Vehicle Scale Systems

(This item was Assigned)

The original purpose of this item was to recognize a higher accuracy class and appropriate requirements in Section 2.25. Weigh-In-Motion Systems Used for Vehicle Enforcement Screening Tentative Code by adding commercial and law enforcement applications. In particular, WIM vehicle scale systems capable of performing to within the tolerances specified for a higher accuracy class would be permitted for use in commercial applications and for highway law enforcement. The WIM Task Group (TG), however, agreed in 2016 that it would be more appropriate to address these higher accuracy WIM systems by proposing changes to Section 2.20. Scales Code, which remains the current effort of the TG.

Source:
Rinstrum, Inc. and Right Weigh Innovations (2016)

Purpose:
Recognize commercial Weigh-in-Motion vehicle scale systems.

Item under Consideration:
Amend NIST Handbook 44 Scales Code as follows:

S.1. Design of Indicating and Recording Elements and of Recorded Representations.

…

S.1.1.1. Digital Indicating Elements.

(a) A digital zero indication shall represent a balance condition that is within ± ½ the value of the scale division.

(b) A digital indicating device shall either automatically maintain a "center-of-zero" condition to ± ¼ scale division or less, or have an auxiliary or supplemental "center-of-zero" indicator that defines a zero-balance condition to ± ¼ of a scale division or less. A "center-of-zero" indication may operate when zero is indicated for gross and/or net mode(s).
[Nonretroactive as of January 1, 1993]

(a) Weigh-in-Motion Vehicle Scales Zero or Ready Indication.

(1) Provision shall be made to indicate or record either a zero or ready condition.

A zero or ready condition may be indicated by other than a continuous digital zero indication, provided that an effective automatic means is provided to inhibit a measuring operation when the device is in an out-of-zero or non-ready condition.

(Amended 1992 ~~and~~ 2008**, and 20XX**)

…

S.1.8. Computing Scales.

…

S.1.8.6. Values to be Recorded, Weigh-In-Motion Vehicle Scales. – At a minimum, the following values shall be printed and/or stored electronically for each vehicle weighment:

(a) lane identification (required if more than one lane at the site has the ability to weigh a vehicle in motion);

(b) weight and sequence of each axle;

(c) total vehicle weight;

(d) time and date.

(Added 20XX)

…

S.1.14. Weigh-In-Motion Vehicle Scale: Operational Limitation. - A weigh-in-motion vehicle scale shall not provide a weight indication or recorded representation if any operational limitation is exceeded.

(Added 20XX)

...

S.2. Design of Balance, Tare, Level, Damping, and Arresting Mechanisms.

S.2.1. Zero-Load Adjustment.

S.2.1.1. General. – A scale shall be equipped with means by which the zero-load balance may be adjusted. Any loose material used for this purpose shall be enclosed so that it cannot shift in position and alter the balance condition of the scale.

Except for an initial zero-setting mechanism, an automatic zero adjustment outside the limits specified in S.2.1.3. Scales Equipped with an Automatic Zero-Tracking Mechanism is prohibited.

(Amended 2010)

S.2.1.2. Scales used in Direct Sales. – A manual zero-setting mechanism (except on a digital scale with an analog zero-adjustment mechanism with a range of not greater than one scale division) shall be operable or accessible only by a tool outside of and entirely separate from this mechanism, or it shall be enclosed in a cabinet. Except on Class I or II scales, a balance ball shall either meet this requirement or not itself be rotatable.

A semiautomatic zero-setting mechanism shall be operable or accessible only by a tool outside of and separate from this mechanism or it shall be enclosed in a cabinet, or it shall be operable only when the indication is stable within plus or minus:

(a) 3.0 scale divisions for scales of more than 2000 kg (5000 lb) capacity in service prior to January 1, 1981, and for all axle load, railway track, **weigh-in-motion vehicle systems**, and vehicle scales; or

(Amended 20XX)

(b) 1.0 scale division for all other scales.

S.2.1.3. Scales Equipped with an Automatic Zero-Tracking Mechanism

S.2.1.3.1. Automatic Zero-Tracking Mechanism for Scales Manufactured Between January 1, 1981, and January 1, 2007. –The maximum load that can be "rezeroed," when either placed on or removed from the platform all at once under normal operating conditions, shall be for:

(a) bench, counter, and livestock scales: 0.6 scale division;

(b) vehicle, **weigh-in-motion vehicle systems**, axle load, and railway track scales 3.0 scale divisions; and

(Amended 20XX)

(c) all other scales: 1.0 scale division.

(Amended 2005)

S.2.1.3.2. Automatic Zero-Tracking Mechanism for Scales Manufactured on or after January 1, 2007 – The maximum load that can be "rezeroed," when either placed on or removed from the platform all at once under normal operating conditions, shall be:

(a) for vehicle, **weigh-in-motion vehicle systems**, axle load, and railway track scales: 3.0 scale divisions; and

(b) for all other scales: 0.5 scale division.

(Added 2005)

….

S.2.5. Damping Means – An automatic-indicating scale and a balance indicator shall be equipped with effective means to damp oscillations and to bring the indicating elements quickly to rest.

S.2.5.1. Digital Indicating Elements. – **Except for weigh-in-motion vehicle systems being operated in a dynamic mode,** ~~Digital~~ digital indicating elements equipped with recording elements shall be equipped with effective means to permit the recording of weight values only when the indication is stable within plus or minus:

(Amended 20XX)

(a) 3.0 scale divisions for scales of more than 2000 kg (5000 lb) capacity in service prior to January 1, 1981, hopper (other than grain hopper) scales with a capacity exceeding 22 000 kg (50 000 lb), and for all vehicle, axle load, livestock, and railway track scales; and

(b) 1.0 scale division for all other scales.

The values recorded shall be within applicable tolerances.
(Amended 1995)

…

N.7. Weigh-in-Motion Vehicle Scale.

N.7.1. Static Testing. – A Weigh-in-Motion Vehicle Scale shall be tested statically, whenever possible, using field standard weights / test loads in accordance with Table 4, uniformly distributed on the scale platform. Additionally, for scale platforms with a length of less than 4 feet a test load not greater than one half of section capacity shall be positioned between the centerline and left and right side respectively. Scale platforms with a length of 4 feet or greater shall be tested in accordance with N.1.3.3.1. Class IIIL acceptance and maintenance tolerance as shown in Table 6. shall apply.

N.7.2. Dynamic Testing. – The Dynamic test for a Weigh-in-Motion-Vehicle Scale shall simulate the normal intended use as closely as possible i.e. test as used. The minimum test shall consist of a vehicle(s), loaded with known field standards, dynamically weighed three consecutive times. The known field standards should then be unloaded and three additional dynamic weighments of the empty vehicle(s) should be recorded. Additionally, for scale platform widths greater than 11 feet, at least one of the loaded vehicle runs and empty vehicle runs shall be made near the left edge and right edge of the scale platform respectively. Class IIIL acceptance and maintenance tolerance as shown in Table 6. shall apply to the known field test standards load minus the calculated value (loaded weight – unloaded weight = calculated value) the Table 6 tolerance values shall be based on the value of the known test load.

(Added 20XX)

…

T.N.3. Tolerance Values.

….

T.N.3.X. Tolerances for Weigh-in-Motion Vehicle Scales. –

T.N.3.X.1. Static Weighing. -Acceptance tolerance shall be one-half maintenance tolerance shown in Table 6. Maintenance Tolerances.

T.N.3.X.2 Dynamic Weighing. - Acceptance tolerance shall be one-half maintenance tolerance shown in Table 6. Maintenance Tolerances.

(Added 20XX)

…

UR.1. Selection Requirements. – Equipment shall be suitable for the service in which it is used with respect to elements of its design, including but not limited to, its capacity, number of scale divisions, value of the scale division or verification scale division, minimum capacity, and computing capability.[1]

...

UR.1.6. Recording Element, Class III L Weigh-In-Motion Vehicle Scales – Class III L Weigh-In-Motion Vehicle Scales must be equipped with a recording element.

(Added 20XX).

...

UR.2.6. Approaches

UR.2.6.1. Vehicle Scales *– On the entrance and exit end(s) of a vehicle scale, there shall be a straight approach as follows:*

(a) the width at least the width of the platform,

(b) the length at least one-half the length of the platform but not required to be more than 12 m (40 ft), and

(c) not less than 3 m (10 ft) of any approach adjacent to the platform shall be in the same plane as the platform. Any slope in the remaining portion of the approach shall ensure (1) ease of vehicle access, (2) ease for testing purposes, and (3) drainage away from the scale.

In addition to (a), (b), and (c), scales *installed in any one location for a period of six months or more shall have not less than 3 m (10 ft) of any approach adjacent to the platform constructed of concrete or similar durable material to ensure that this portion remains smooth and level and in the same plane as the platform; however, grating of sufficient strength to withstand all loads equal to the concentrated load capacity of the scale may be installed in this portion.*

[Nonretroactive as of January 1, 1976]

(Amended 1977, 1983, 1993, 2006, and 2010)

UR.2.6.2. Axle-Load Scales – At each end of an axle-load scale there shall be a straight paved approach in the same plane as the platform. The approaches shall be the same width as the platform and of sufficient length to insure the level positioning of vehicles during weight determinations.

UR.2.6.3. Weigh-in-Motion Vehicle Scales. - At each end of a Weigh-in-Motion Vehicle Scale there shall be a straight approach in the same plane as the platform. The approaches shall be the same width as the platform and of sufficient length to insure the level positioning of vehicles during weight determinations. Both approaches shall be made of concrete or similar durable material (e.g., steel).

(Added 20XX)

...

[1] Purchasers and users of scales such as railway track, hopper, and vehicle scales should be aware of possible additional requirements for the design and installation of such devices.

(Footnote Added 1995)

UR.3.2. Maximum Load. – A scale shall not be used to weigh a load of more than the nominal capacity of the scale.

UR.3.2.1. Maximum Loading for Vehicle Scales. – A vehicle scale shall not be used to weigh loads exceeding the maximum load capacity of its span as specified in Table UR.3.2.1. Span Maximum Load.
(Added 1996)

Note: UR.3.2.1. is not applicable to Weigh-In-Motion Vehicle Scales.
(Added 20XX)

…

UR.3.3. Single-Draft Vehicle Weighing. A vehicle or a coupled-vehicle combination shall be commercially weighed on a vehicle scale only as a single draft. That is, the total weight of such a vehicle or combination shall not be determined by adding together the results obtained by separately and not simultaneously weighing each end of such vehicle or individual elements of such coupled combination. However, the weight of:

(a) a coupled combination may be determined by uncoupling the various elements (tractor, semitrailer, trailer), weighing each unit separately as a single draft, and adding together the results; or

(b) a vehicle or coupled-vehicle combination may be determined by adding together the weights obtained while all individual elements are resting simultaneously on more than one scale platform.

Note: This paragraph does not apply to **weigh-in-motion vehicle scales,** highway-law-enforcement scales and scales used for the collection of statistical data.
(Added 1992) **(Amended 20XX)**

…

UR.3.7. Minimum Load on a Vehicle Scale or Weigh-in-Motion Vehicle Scale. – A vehicle scale **or weigh-in-motion vehicle scale** shall not be used to weigh net loads smaller than:

(a) 10 d when weighing scrap material for recycling or weighing refuse materials at landfills and transfer stations; and

(b) 50 d for all other weighing.

As used in this paragraph, scrap materials for recycling shall be limited to ferrous metals, paper (including cardboard), textiles, plastic, and glass.
(Amended 1988, 1992, ~~**and**~~ 2006**, and 20XX**)

…

UR.3.9. Use of Manual Weight Entries. – Manual gross or net weight entries are permitted for use in the following applications only when:

(a) a point-of-sale system interfaced with a scale is giving credit for a weighed item;

(b) an item is pre-weighed on a legal for trade scale and marked with the correct net weight;

(c) a device or system is generating labels for standard weight packages;

(d) postal scales or weight classifiers are generating manifests for packages to be picked up at a later time; or

(e) livestock and vehicle scale **<u>or weigh-in-motion vehicle scale</u>** systems **<u>that</u>** generate weight tickets to correct erroneous tickets.

(Added 1992) (Amended 2000 ~~and~~ 2004**<u>, and 20XX</u>**)

Background and Discussion:

Note: This agenda item previously appeared on the Committee's agenda as Agenda Item 325-1 in 2016 and 3205-1 in 2017.

Rinstrum, Inc. and Right Weigh Innovation submitted a proposal in 2016 to modify the tentative WIM Code for screening and sorting. The idea was to keep all WIM applications within the same code section of NIST Handbook 44. Rinstrum proposed to add slow-speed devices to the existing screening and sorting code with two separate applications; one for commercial legal-for-trade and one for direct law enforcement. In consideration of the changes proposed, there would be three different applications covered by the same code, which was causing some confusion. Because of the legal-for-trade application, it was suggested that that proposed modifications probably belonged in the Scales Code.

Rinstrum manufactures the axleWEIGHr in-motion scale, which is a slow-speed WIM axle scale system capable of performing to within Class IIIL maintenance tolerance, according to Rinstrum. Rinstrum has indicated that the axleWEIGHr is a niche product, which creates a new segment for axle weighing devices. The axleWEIGHr calculates the GVW and weighs individual axles while a truck crosses the scale at 1-3 MPH. Rinstrum has also indicated the most common applications for its device will be agricultural farmers, small trucking companies, or manufacturers that are interested to determine GVW and axle weights before the vehicle enters the public roadway.

The proposed requirements are based in part on requirements in OIML R 134, "Automatic instruments for weighing road vehicles in motion and measuring axle loads." Test data and experience at multiple test sites demonstrate this system can meet the performance requirements that are proposed.

The 2016 NCWM Interim Meeting saw Rinstrum request the NCWM Chairman form a WIM TG to bring together regulators and private sector stakeholders to discuss WIM technology. Rinstrum sought a Developing status so that it could maintain ownership of the proposal and continue to work on its development.

During the 2016 NCWM Interim Meeting, Mr. John Lawn (Rinstrum, Inc.) presented a short slide presentation on a slow-speed WIM system that Rinstrum, Inc., manufactures. A copy of the slides from his presentation was inserted into Appendix B of the Committee's 2016 Final Report, which is available at **www.nist.gov/pml/weights-and-measures/ncwm-2016-annual-report-sp-1212.**

In February 2016, the NCWM agreed to form a TG, at the recommendation of the Committee to consider a proposal that would expand the new NIST Handbook 44 Weigh-In-Motion Systems Used for Vehicle Enforcement Screening – Tentative Code to also apply to commercial use. Mr. Alan Walker (Florida) agreed to serve as chairman of the new TG.

The Committee received an update on this item during the 2016 NCWM Annual Meeting from Mr. John Lawn (Rinstrum, Inc.). Mr. Lawn reported that the TG had agreed that the proposal needed to be changed to separate the requirements for WIM systems used in commercial application from those used for direct enforcement. He requested the Committee replace the proposal included in the Item Under Consideration with a synopsis, which he offered to prepare and provide to the Committee given the current proposal was no longer being considered.

The Committee agreed to replace the proposal in the Item Under Consideration with the synopsis to be developed by Mr. Lawn as requested. Rinstrum's original proposal was replaced following the 2016 NCWM Annual Meeting and is available for review, as is the synopsis developed by Mr. Lawn, in the Committee's 2016 Final Report from **www.nist.gov/pml/weights-and-measures/ncwm-2016-annual-report-sp-1212.**

At that time, the Committee also changed the status of the item to "Information" because an NCWM TG, under the direction of the Committee, was now assisting in the development of the proposal. This change in status wss an indication that the Committee had taken on responsibility for the additional development of this item.

At the 2017 NCWM Interim Meeting, an update was given on this item by Mr. Alan Walker (Florida), Chairman of NCWM's Weigh-In-Motion TG and Mr. Lawn. Mr. Walker noted that the TG is reviewing the different paragraphs in the Scales Code of HB 44 to determine needed amendments to address WIM vehicle scale systems. That review started with the "Application" section of the code and has now progressed to the "Notes" section of the code. Mr. Lawn reported on the recent testing of a Rinstrum WIM vehicle scale system by the State of Illinois, which had been witnessed by some members of the TG. He indicated the results of this testing proved inclusive due to poor weather conditions on the day of the test.

At the 2017 NCWM Annual Meeting, an update was given to the Committee on this Information item and the status of the work performed by the NCWM's Weigh-In-Motion TG by Mr. Walker, Chairman of the TG. Mr. Walker reported that the TG had made considerable progress this past year and had reached a point where it believes it would of value to submit the revised document and ask for feedback. Mr. Walker also mentioned the TG will develop a 'white paper' identifying specific changes for which the TG is hoping to receive feedback.

Mr. Lawn further reported the TG needed feedback to determine the best way to test WIM vehicle scale systems intended for commercial applications. He said he felt if the device was tested statically, the tolerance values should be based on acceptance and maintenance tolerances currently defined for a Class III L device. He then indicated testing for dynamic operation is different from static operation and dynamic testing should consist of three consecutive test runs with the vehicle loaded with test weights followed by three consecutive test runs with the vehicle unloaded. Mr. Lawn stated that WIMs tested dynamically should be required to comply with tolerances where acceptance and maintenance tolerances are the same and that the rationale for this is the fact that dynamic tests on systems such as CIM RR scales and dynamic monorail systems use the same values for acceptance and maintenance tolerance. He further stated that tolerance values should only be applied to the value of the test weights used in the vehicle during the first three test runs. Mr. Lawn explained that the procedure consisting of three consecutive runs of a loaded vehicle followed by three consecutive runs of the vehicle unloaded would produce satisfactory results and would better avoid the introduction of unknown errors that may be incorporated if the testing involved a reference scale that was not installed at the same location as the WIM under test.

See the Committee's 2016 and 2017 Final Reports for additional details and background information relating to this item.

During the 2018 NCWM Interim Meeting, Mr. Tim Chesser (Arkansas) Co-Chairman of the NCWM's Weigh-In-Motion Task Group (TG) presented the Committee with a letter detailing a change to Section T.N.3.X.2 that the TG had made regarding the applied tolerance value when performing dynamic testing. Mr. Chesser reported the TG had resolved the tolerance issue and was now recommending acceptance tolerance be equal to one-half of maintenance tolerance when performing dynamic testing. Mr. Chesser also identified each TG member by name and thanked them for their efforts and asked the Committee on behalf of the TG to move the item forward as Voting.

Mr. Henry Oppermann (Weights and Measures Consulting LLC) commented he was concerned that axle weights are being summed together to represent a gross weight and feels the proposed test method is not sufficient since the scale is not tested across it weighing range and not tested at its capacity. He is concerned as to how the error rounding of the individual axle weights and the gross weight would be handled. Mr. Oppermann also questioned if this was an automatic or non-automatic instrument since error handling are different for each. Mr. Oppermann stated that there are 15 different truck configurations on the highway; 3 axle trucks make up 25%, while a 4-axle truck is the most common at 40%. Testing only one truck configuration is not a satisfactory test. Mr. Oppermann does not support the proposal.

Mr. Lawn summarized the progress of the TG and explained how the group reached an agreement on the change to the tolerance values used during dynamic testing. He went on to say that recommended test method is similar to the strain load test which is in use today.

Mr. Russ Vires (Mettler-Toledo, LLC), speaking on behalf of the SMA, stated the SMA position was developed before the TG agreed to the tolerance change and commented that the SMA will evaluate the change at its next meeting. Mr. Vires went on to speak on behalf of Mettler-Toledo LLC stating with agreement to the tolerance change he recommends moving the proposal forward as Voting.

Mr. Lou Straub (Fairbanks Scales) commented that, while Fairbanks supports the change in tolerance values used during dynamic test, he feels additional work is needed in the testing and believes that additional devices and tests need to be performed.

Mr. Eric Golden (Cardinal Scale) commented he can support the code with the change in tolerance values used for dynamic testing and feels the need for additional testing should not hold up the code from moving forward.

Mr. Louis Sakin (Towns of Holliston, Hopkinton, and Northbridge, Massachusetts), Mr. Jason Glass (Kentucky), Mr. Gene Robertson (Mississsippi), and Mr. Rich Lewis (Georgia) all voiced their support for the item to move forward as a Voting item.

Mr. Ken Ramsburg (Maryland) stated support for the item but feels the wording of UR2.6.3 Approaches needs to be changed to mention this instrument type; specifically, regarding the length and level requirements.

Mr. Richard Suiter (Richard Suited Consulting) commented the dynamic testing defined in N.7.2. represents testing of the instrument "as used" by testing loaded and unloaded vehicles and commented that this method is similar to the strain load test which has been in use for many years. Mr. Suiter commented that the approaches should be as recommended by the manufacturer. Mr. Suiter recommended the item move forward as Voting.

Mr. Steve Beitzel (Systems Associates Inc.) commented that the testing of in-motion railway track scale is more detailed than what is being proposed for in-motion vehicle scale testing. Mr. Beitzel opposed the item based on insufficient testing requirements.

During the Committee's work session, Committee members considered all comments and agreed to change the tolerance values used during the dynamic testing as recommended by the TG. The Committee members also considered the comment from the TG stating that the item is complete and that its members feel it is ready for adoption. Consequently, the Committee agreed to move the item forward as a Voting item.

At the 2018 NCWM Annual Meeting, the Committee received many comments suggesting that the current proposal was not developed enough to be considered for vote and recommending it be returned to the submitter or WIM TG for further development. The following is a list of the persons/groups suggesting this item be returned and the significant reasons provided for making such a suggestion:

- SMA: The SMA opposes the item as written and recommends the item be downgraded to Informational for further work. The SMA appreciates the work that the WIM Task Group has done thus far, but believes further work needs to be done regarding the testing methods to be used. Additional suggestions have been developed which should be considered.

- Mr. Russ Vires (Mettler-Toledo LLC and an active participant on the WIM TG) commented Mettler-Toledo is concerned that the changes proposed to NIST HB 44 don't adequately address test procedures. NIST HB 44 should identify a robust standard (not the minimum); that, if followed, would assure a good weighing result. He recommended the item be downgraded to Information or Developing for further development. Mettler-Toledo LLC does not manufacture an axle-load scale that can perform to within Class IIIL tolerances.

- Mr. Richard Harshman (NIST OWM) emphasized the need for Rinstrum (or any other WIM vehicle scale manufacturer) to provide comparison test data that shows its system can comply with the Class IIIL Acceptance tolerance specified in the proposal. The following comments were offered by Mr. Harshman on behalf of NIST OWM during open hearings:

  - Downgrading this item to Assigned or Developing is the proper thing to do.

- OWM believes this item still requires substantial development before it can be fully considered, noting:
  - Some concerns have not been adequately addressed.
  - Many of the changes currently proposed lack the amount detail necessary to ensure these systems, once installed, will provide consistently accurate weighing results over time.
- Key elements that have been missing throughout this exercise and need to be addressed to develop a proposal for consideration include:
  - Proof of the existence of a WIM vehicle scale system that can actually perform to within the 0.2% tolerance originally claimed by Rinstrum under all conditions of anticipated use.
  - To date, we have no evidence of a WIM vehicle scale system being manufactured that can meet the HB 44 Accuracy Class IIIL Maintenance and Acceptance tolerances currently specified in the proposal under all conditions of anticipated use.
  - OWM emphasizes use of the words "under all conditions of anticipated use" because there are no use limitations specified in the current proposal, so OWM's expectation is the system be accurate when weighing any and all types of vehicles.
- It is inappropriate for members of a TG to be developing proposed changes to HB 44, which are intended to address commercial WIM vehicle scale systems of an Accuracy Class IIIL without first knowing for certain there's a system being produced that can meet those tolerances under all conditions of anticipated use.
- If the weights and measures community is to accept these systems for commercial application, it must first be proven that the weights obtained from using them comply with the commercial tolerances under all conditions of anticipated use. This has not yet occurred.
- OWM appreciates Rinstrum's willingness to try and close this gap by offering to collect and share the data that the Committee would need to possibly support continuing efforts to develop the proposal.
  - As others have also pointed out, OWM thinks it's important that this data be collected in such a way that it's of use to the Committee in validating the accuracy of Rinstrum's system.
  - OWM would welcome the opportunity to assist in developing the testing model to be used in collecting the comparison data to better ensure this data would be useful.
  - To ensure that the Committee's needs are met OWM encourages Rinstrum to involve the Committee so that members can see for themselves the results of the comparison testing and exactly how the data was collected.
- If the data collected shows the WIM system is capable of meeting the tolerances specified under all conditions of anticipated use, OWM would encourage further development of the proposal, but if the data does not support the manufacturer's claims, OWM suggests the Committee consider withdrawing the item.

- OWM also noted in its written analysis of this item to the Committee:
  - Adequate test standards for testing these systems have not been identified and approved; and

- It is inappropriate to expect NTEP to develop test procedures for type evaluation when members of the WIM Task Group have not been able to agree on minimum field test procedures necessary to verify the accuracy of a WIM vehicle scale system to the tolerances specified.

- Mr. Tim Chesser (Arkansas and co-chairman of the WIM TG) commented the TG earlier had the majority of its members recommend the item be presented for vote. In consideration of those who most recently have suggested the proposal needs additional development, Mr. Chesser reported that he had surveyed members of the TG and the group is now in favor of continuing to work on the item. Mr. Chesser recommended the Committee designate the status of the item "Assigned" and return it to the TG.

- Two other members of the TG, Mr. Eric Golden (Cardinal Scale Manufacturing) and Mr. Lou Straub (Fairbanks Scales) recommended the item be assigned to the TG, noting a desire to keep the TG in place. A Developing status would return the item to the submitter and the TG would disband.

The Committee also received written comments from Mr. Oppermann who opposed the item because he believes the proposed test procedure is inadequate and a more comprehensive test is needed. In his comments to the Committee, Mr. Oppermann provides a list of many unanswered questions, which he believes still need to be addressed.

Mr. Brad Fryburger (Rinstrum) recommended the Committee change the status of the item from Voting to Assigned, which would provide Rinstrum the opportunity to collect the necessary data being requested. He requested feedback on the information the Committee would need to advance the item forward, noting that Rinstrum does not want to go through the expense and effort of collecting data only to learn later that it wasn't collected in a manner satisfactory to the Committer or wasn't the data being sought.

Mr. Dick Suiter (Richard Suiter Consulting and consultant to Rinstrum) suggested the TG could present the item for vote considering that the TG has been together for over two years developing the current proposal (which he referred to as being "well developed") and such action had been recommended by the TG at the 2018 NCWM Interim Meeting. The test procedures proposed in this item are technically sound. The WIM vehicle scale system is first tested statically, and then, when tested dynamically, the tolerance is applied only to the known test standards. Mr. Suiter reported that he was aware of four additional manufacturers of WIM vehicle scale systems that, either already had a device or system ready for sale or would soon have one ready.

In consideration of the numerous comments heard in support of assigning this item to the TG and the need for the submitter to provide comparison test data that shows its equipment can comply with the tolerances specified in the proposal, the Committee agreed to recommend the item be assigned to the TG. Members of the Committee also agreed it is important for the TG to develop the testing protocol for use in collecting the comparison test data. Mr. Fryburger, who was present during the Committee's work session, reported he believed Rinstrum would be able to provide the data required by the Committee by the 2019 NCWM Interim Meeting. He also requested Committee involvement in the collection of the comparison data.

Regional Association Comments:
At its fall 2017 Annual Meeting, the WWMA agreed to recommend this item move forward as an Information item. The WIM Vehicle Scale Task Group has circulated a white paper during the open hearings requesting input from the membership of the region. The WWMA's S&T Committee encourages those wanting to provide input to contact Mr. Alan Walker (Florida) Chairman of the Task Group, or Mr. Tim Chesser (Arkansas) Co-Chairman of the Task Group. Several of those giving testimony at the open hearings stated that they would like the acceptance tolerance to equal one-half the maintenance tolerance for both static and dynamic testing. Another comment was heard suggesting the acceptance tolerance be equal to one-half the maintenance tolerance for static testing and equal to the maintenance tolerance for dynamic testing.

At its fall 2017 Annual Meeting, the SWMA's S&T Committee heard comments from members of the WIM Task Group, who noted that a lot of progress has been made, but additional input is still needed. Multiple weighing device manufacturers, who are also members of the Task Group, expressed concerns about modifications to the tolerances and urged caution in considering the impact such changes might have. There were also questions raised regarding how the tolerance structure was established for other dynamic systems, including in-motion monorail scales and railway track scales, and some noted that review of the history for how these tolerances were established is warranted. Some also commented that additional work is needed on the test procedures; until clear test procedures can be established and agreed upon, there is no evidence that the systems can meet the proposed tolerances under conditions of normal use. The SWMA S&T Committee also heard comments indicating that more data is needed to make an informed decision regarding changes to the tolerances. The Chairman of the Task Group, Mr. Walker, commented that prior to elevating this item to a Voting item, the Task Group needs additional input, particularly from weights and measures jurisdictions to assess what additional work is needed, and he noted this may include collecting test data demonstrating that systems can meet the tolerances. The SWMA recommends this item remain Informational until such time that additional information has been gathered and a recommendation made by the Task Group to the NCWM S&T Committee to change the status of the item.

At the CWMA's fall 2017 Interim Meeting, the Committee heard support from Cardinal Scale Manufacturing and Fairbanks Scales for leaving acceptance tolerance one-half of maintenance tolerance. Mr. Suiter (Richard Suiter Consulting), speaking on behalf of Rinstrum as consultant, and a second unidentified person from Rinstrum, supported acceptance tolerances being equal to maintenance tolerances for dynamic testing of WIM vehicle scale systems so that the tolerances applicable to dynamic tests would be uniform throughout NIST HB 44. The CWMA's S&T Committee reported it believes this item has merit, however as (previously mentioned) devices need NTEP certification before being placed into commercial service. The CWMA recommended that this be a Developing item at the CWMA's 2017 Interim Meeting. The CWMA recommended, at its spring 2018 Annual Meeting, this item be downgraded to an Assigned item on the NCWM agenda. The CWMA's S&T Committee received written comments from the SMA and Mr. Oppermann (Weights and Measures Consulting, LLC) opposing the item and recommending it be downgraded to Informational for further work. The CWMA received comments from Rinstrum, Mr. Harshman (NIST OWM), Ms. Lori Jacobsen (SD), Mr. Straub and Mr. Suiter (Richard Suiter Consulting, on behalf of Rinstrum). The CWMA reported it would like to see this type of technology develop but believes the submitter needs to provide adequate data and the test procedures used to collect this data to support the claim this equipment is capable of meeting the required tolerances in NIST HB 44 under all conditions of anticipated use.

At NEWMA's fall 2017 Interim Meeting, a comment was submitted electronically by Mr.Straub as a member of the WIM Task Group that there is disagreement within the task group on what kinds of tolerances should be met. Item submitter Mr. Lawn asked that maintenance and acceptance tolerance be the same. Mr. Golden (Cardinal Scale Manufacturing) believes that the acceptance tolerance should be half the maintenance tolerance. The WIM task group is looking for additional comments to further develop the item. NEWMA recommended that this item move forward as Informational and to be developed by the WIM task group. At NEWMA's spring 2018 Annual Meeting, it was reported that during the 2018 NCWM Interim Meeting, the National S&T Committee had agreed to change the tolerance values used for dynamic testing as recommended by the task group. The NEWMA S&T Committee heard from the submitter in support of this item being presented for voted. Other comments were received were that this item has moved too fast and that there isn't enough supporting test data to justify a Voting item. NIST believes there are still a number of issues and that there is further developing to be done. The SMA opposed this item and recommended it to be Informational. NEWMA agreed to recommend this item be downgraded to Developing and that the submitter provide supporting data from testing.

Additional letters, presentations, and data may have been submitted for consideration with this item. Please refer to **www.ncwm.com/interim-archive** to review these documents.

ABW – AUTOMATIC BULK WEIGHING SYSTEMS

ABW-3 D A. Application, S Specifications, N. Notes, UR. User Requirements

Source:
Kansas (2016)

Purpose:
Modernize the Automatic Bulk Weighing Systems (ABWS) Code to more fully the reflect the types of systems in use and technology available while still maintaining the safeguards of the current code.

Item under Consideration:
Amend NIST Handbook 44 Automatic Bulk Weighing Systems Code as follows:

A. Application

A.1. General. – This code applies to ~~**automatic bulk**~~ weighing systems, ~~**that is, weighing systems**~~ **capable of** ~~**adapted to the automatic**~~ **automatically** weighing ~~**of a commodity in**~~ successive drafts of **a commodity without operator intervention.** ~~**predetermined amounts automatically recording the no-load and loaded weight values and accumulating the net weight of each draft.**~~
(Amended 1987 **and 20XX**)

S. Specifications

S.1. Design of Indicating and Recording Elements and Recorded Representations.

S.1.1. Zero Indication. – ~~**Provisions**~~ **An automatic bulk weighing system** shall ~~**be made to**~~ indicate and record a no-load reference value and, if the no-load reference value is a zero value indication, to indicate and record an out-of-balance condition on both sides of zero.
(Amended 20XX)

….

S.1.5. Recording Sequence. – ~~**Provision**~~ **An automatic bulk weighing system** shall ~~**be made so that**~~ **indicate** all weight values ~~**are indicated**~~ until ~~**the completion of the**~~ recording of the indicated value **is completed**.
(Amended 20XX)

S.1.6. Provision for Sealing Adjustable Components on Electronic Devices. – Provision shall be made for applying a security seal in a manner that requires the security seal to be broken before an adjustment can be made to any component affecting the performance of the device.

S.1.7. No Load Reference Values – An automatic bulk weighing system shall indicate and record weight values with no load in the load-receiving element. No load reference values must be recorded at a point in time when there is no product flow into or out of the load receiving element. Systems may be designed to stop operating if a no load reference value falls outside of user designated parameters. If this feature is designed into the system then the no load reference value indicated when the system is stopped must be recorded, an alarm must activate, weighing must be inhibited, and some type of operator intervention must be required to restart the system after it is stopped.
(Added 20XX)

S.1.8. Loaded Weight Values – An automatic bulk weighing system shall indicate and record

loaded weight values for each weighment.

(Added 20XX)

S.1.9. Net Weight Values – An automatic bulk weighing system shall calculate and record net weight for each weighment.

(Added 20XX)

S.1.10. Net Weight Accumulation – An automatic bulk weighing system shall accumulate and record the sum of all net weight values for all weighments performed during a weighing process.

(Added 20XX)

S.3. Interlocks and ~~Gate Control~~Product Flow Control.

S.3.1. ~~Gate Position~~Product Flow Control. ~~Provision~~ An automatic bulk weighing system shall ~~**be made to**~~ clearly indicate to the operator **product flow status** ~~**the position of the gates leading directly**~~ to and from the ~~**weigh hopper**~~ **load receiving element. Many types of equipment can be used to control the flow of product into and out of a load receiving element automatically including but not limited to gates, conveyors, augers, robots, pipes, tubes, elevators, buckets, etc.**

(Amended 20XX)

S.3.2. Interlocks. – Each automatic bulk weighing system shall have operating interlocks to provide for the following:

(a) Product cannot be cycled and weighed if the weight recording element is disconnected or subjected to a power loss.

(b) **can only** ~~**cannot print**~~ **record** a weight if ~~**either of the gates**~~ **equipment controlling product flow to or from the load-receiving element is in a condition which prevents product entering or leaving the load receiving element**~~**. leading directly to or from the weigh hopper is open.**~~

(c) A "low paper" sensor, when provided, is activated.

(d) The system will operate only in the proper sequence in all modes of operation.

(e) When an overfill alarm is activated, the system shall indicate and record an overfill condition.

(Amended 1993 **and 20XX**)

S.3.3. Overfill ~~Sensor~~And Interference Detection.

(a) **An automatic bulk weighing system must have a means to detect when** ~~**The**~~ **the** ~~**weigh hopper**~~ **load-receiving element** ~~**shall be equipped with an**~~ **is** overfill**ed. When an overfill condition exists** ~~**sensor which will cause the feed**~~ **product flow to the load receiving element must be stopped,** ~~**gate to close**~~ **an alarm must activate**, ~~**activate an alarm, and inhibit**~~ weighing **must be inhibited** until the overfill condition has been corrected**, and some type of operator intervention must be required to restart the system**. **An alarm could be many things including a flashing light, siren, horn, flashing computer screen, etc. The intent of an alarm is to make the operator aware there is a problem which needs corrected.**

(Added 1993) **(Amended 20XX)**

(b) ~~**If the system is equipped with a**~~ **Downstream storage devices and other equipment, permanent or temporary,** ~~**lower garner or surge bin, that garner shall also**~~ **which have the potential to interfere with weighment when overfilled or not functioning properly must have a means to prevent interference. When interference exist the system must stop, an alarm must activate, product flow must stop, weighing must be inhibited until the interference has been corrected,**

and some type of operator intervention is required to restart the system. ~~**be equipped with an overfill sensor which will cause the gate of the weigh hopper to remain open, activate an alarm, and inhibit weighing until the overfill condition has been corrected.**~~
[Nonretroactive as of January 1, 1998]
(Amended 1997 **and 20XX**)

N. Notes

N.1. Testing Procedures.

N.1.1. Test Weights. – The increasing load test shall be conducted using test weights equal to at least 10 % of the capacity of the system:

(a) on automatic ~~**grain**~~ bulk**-** weighing systems installed after January 1, 1984 **used to weigh grain**; and

(b) on other automatic bulk-weighing systems installed after January 1, 1986.
(Amended 1987**, and 20XX)**

UR. User Requirements

UR.4. System Modification. – **Components of** ~~**The**~~ **the automatic bulk** weighing system, shall not be modified except when the modification has been approved by a competent engineering authority, preferably that of the engineering department of the manufacturer of the scale, and the official with statutory authority having jurisdiction over the scale.
(Amended 1991 **and 20XX**)

Background/Discussion:

Note: This agenda item appeared on the Committee's 2016 and 2017 agendas as Agenda Item 322-1 and 3202-1, respectively. Additionally, the submitter of this item provided updated proposals to the Committee following the 2016 NCWM Annual Meeting and again in October 2017. The updated version provided in October 2017 is that which is shown in Item under Consideration for this item. To view previous versions of the proposal, refer to the Committee's 2016 and 2017 Final Reports.

The following rationale was offered by the submitter of this item for proposing changes to the HB 44 ABWS Code:

- There are many systems in use that don't meet the definition for a "scale" or an "ABWS" or anything else in the Handbook. These changes will make it easier for regulators/inspectors to determine if a system should be evaluated as an "ABWS".
- The wording "automatic bulk weighing systems" should not be used in the definition of the same.
- The "no-load" and "loaded weight" recordings are important, but they are specifications and should not be included in the application code.
- The current code does not clearly define at what level of automation a system would be considered an ABWS versus a scale with some accessory equipment (hopper, tank, etc.). This is an attempt to more clearly distinguish which systems should be considered ABWSs.
- Human intervention could be many things. Some examples include, but are not limited to, pushing a reset button, turning power off then back on, typing a password, or entering a statement into a system log. The intent with including the term "human intervention" is to not include all systems which have a high degree of automation, only the ones that cycle repeatedly and can potentially operate without anyone present to observe weighing malfunctions.

- There are many types of load receiving elements that will work with an ABWS to include, but not limited to, tanks and hoppers so the previous language referring to hoppers was removed and replaced with the generic but accurate term "load receiving element".

- The old language implied separate sensors (e.g., bindicators) were required. Newer systems have already bypassed the use of separate sensors and utilize the weight indications to identify an overfilled condition, similar to how the indications are used to regulate product flow into the load receiving element for some devices. Concerns for this approach have been raised for situations when an indicator is not functioning properly. That is a legitimate concern, but my reply then is: What is the backup for an indicator not indicating properly on any other type of device? This is something we know happens with other devices and commonly may not be detected until a device inspection and test is completed. Thus, one reason routine inspections and testing are required.

- Many types of equipment can be used to control the flow of product into and out of a load receiving element automatically, including but not limited to gates, conveyors, augers, robots, pipes, tubes, elevators, and buckets. Examples would be a conveyer delivering product; in such a case, the recording element should not record if the conveyer is still moving, or in the case of a pneumatic transfer tub the recording element should not record if the blower forcing air through the tube is still operating. Therefore, the old language referring to gates was removed and replaced with more generic terminology which can be applied to any equipment used to control product flow, not just gates.

- Many types of equipment can be used for downstream commodity storage including but not limited to hoppers, tanks, bins, flat storage, trucks, totes, rail cars, and pits. The language referring to "lower garner", "surge bin," etc., has been removed and replaced with more descriptive terms such as "downstream storage devices" to allow for all potential types of product handling equipment.

- A downstream storage device itself may not interfere with the weighing process directly, but it also cannot create a situation in which an overfill condition or some other malfunction of the equipment interferes with the weighing process. An example would be a grain storage hopper located under a weigh hopper in a position which, when grain is mounded up above the storage hopper, the grain touches the bottom of the weigh hopper and interferes with the weighing process. For this example, if the storage hopper can be lowered far enough below the weigh hopper so that the mounded grain cannot touch the weigh hopper when it reaches its' maximum potential height then it would not need the capability to detect an overfill condition. The same scenario would apply to a truck parked under the load receiving element or a conveyer under the load-receiving element. Wording was added to ensure interference does not occur and if it does that the system activates controls to prevent weighing errors.

The original code was written for very specific equipment for a very specialized use. This is a fairly drastic change from the original and introduces some new terminology that may present some confusion or uncertainty to those who were fairly familiar with the existing code. Some individuals feel the proposed changes may add some uncertainty as to what systems should or shouldn't be considered an ABWS.

The Committee received updates on this item by its submitter, Mr. Doug Musick (Kansas) at the NCWM Interim and Annual Meetings of 2016 and 2017. The Committee agreed at each these meetings to maintain the Developing status of the item to provide Mr. Musick the opportunity to fully develop the proposal. The following are some of the more significant comments that the Committee received during these meetings by Mr. Musick and others.

Mr. Musick:

- The current proposal is an initial attempt to update the current ABWS Code to address some newer automated weighing systems known to exist in the marketplace.

- Some of these newer systems are not able to comply with the existing ABWS Code, which provides indication of the need to update the current code.

OWM:

- OWM recognizes the need for HB 44 to include requirements that address some ***automated*** weighing systems currently in the marketplace that, for one reason or another, fail to meet the definition of an ABWS or the application of the ABWS Code. As is the case with an ABWS, these systems are also used to weigh bulk commodities in an automatic operation. A number of these weighing systems do ***not*** consistently return to zero following discharge of a draft load due to factors such as:
  - the density of the commodity being weighed and its susceptibility to cling to the sides of the bin;
  - structural deformations in the load-receiving element (which trap and prevent product from being completely discharged);
  - venting issues;
  - system vibration;
  - other factors
- An example was provided of *some* seed treatment systems, known to exist in the commercial marketplace, that will automatically fill to a load value targeted by the system operator by weighing multiple drafts *automatically* and *without* operator intervention. When these systems are operational, not all the weighed product necessarily gets discharged with the draft load. The remaining product is typically referred to as a "heel." Some of these systems only record the gross weight of the different drafts weighed; yet the "heel" remaining for each draft load cycled through the system needs to be taken into account for an accurate determination of the net quantity to be made.
- The single-most important factor in determining whether or not an automated weighing system needs to take into account the no-load reference and gross-load reference to determine an accurate net weight for individual drafts weighed is the system's ability to consistently return to zero following discharge of the load. This determination must be made on a case-by-case basis and will vary depending on the design of the system and the products being weighed.
- Do the proposed changes belong in the ABWS Code or possibly in an entirely separate code intended to address some automatic weighing systems known to exist in the marketplace for which neither the Scales Code or the ABWS Code seem to fit their design and operational characteristics?
- The existing ABWS Code is intended to apply to systems that weigh only one commodity at a time in successive drafts.

Mr. Richard Suiter (Richard Suiter Consulting):

- Mr. Suiter expressed concerns about striking the language for overfill sensor. He described how the sensors are not just for over capacity of the container; they are also for sensing when the height of the product reaches a point higher than the edge of the container, even though the container may not be at capacity. He advised that this redefining be done with careful consideration.

See the Committee's 2016 and 2017 Final Reports for additional details and background information on this item.

At the 2018 NCWM Interim Meeting the Committee received comments from Mr. Musick submitter of the item. Mr. Musick asked the Committee to keep the item in a Developing status as there are changes being made to the item based on comments and feedback received from recent regional meetings.

Mr. Russ Vires (Mettler-Toledo, LLC), speaking on behalf of the SMA, reported that the SMA takes no position on this item at this time.

During the Committee's work session, it was agreed to keep the item Developing as requested by the submitter.

The Committee did not take comments during open hearings on Developing items at the 2018 NCWM Annual Meeting except to grant the submitter of a Developing item (or block of Developing items) an opportunity to provide an update on the progress made to further develop the item(s) since the 2018 NCWM Interim Meeting. At the 2018 NCWM Annual Meeting open hearings, submitter Mr. Loren Minnich (Kansas) gave an update on the Developing item to the Committee. Mr. Minnich stated that he or Mr. Musick plan on giving presentations at 2018 regional meetings to provide more detail on the item. He also reported there are no significant changes proposed to the ABWS Code by this item and Kansas hopes to have this item fully developed so it can be presented for vote next year.

In written comments to the Committee, the SMA reported it takes no position on this item at this time and looks forward to additional analysis performed by the appropriate stakeholders.

OWM provided the following written recommendations and comments to this item as feedback to the submitter and as part of its analysis of the S&T Committee's 2018 agenda items:

- The changes proposed in ABW-3, ABW-4, and OTH-6 are all related attempts to help clarify and make it easier for field officials to determine the proper HB 44 code to apply to some newer automatic weighing systems that have been introduced into the commercial arena. OWM is unable to envision, based upon its review of these three proposals, how the proposals, whether considered individually, or combined and considered as a group, will accomplish this intended outcome. Addressing these issues in a piecemeal fashion may actually result in more confusion.

- With respect to this particular item, OWM reiterates its comments included in the analysis it provided to the Committee at the January 2018 Interim Meeting. The proposed changes to the Automatic Bulk Weighing Systems (ABWS) Code would expand its application to include some newer automatic weighing systems that currently fail to meet the application of the ABWS Code (or the current HB 44 definition of an ABWS). OWM is not convinced this is a technically sound appropriate approach.

- The current ABWS Code applies to systems that automatically weigh a <u>single</u> commodity in successive drafts; yet we believe it was the submitter's intent in drafting some of the proposed changes that the code also apply to systems that automatically weigh <u>more than one</u> commodity at a time in successive drafts. For example, some seed treatment systems can be programmed to weigh multiple drafts of the same recipe, which, oftentimes, is made up of different ingredients (commodities) that get mixed together to form the treatment for a particular seed type. The various recipes to be weighed by a system can include not only different ingredients, but also different amounts of those ingredients, both of which can affect the price charged to customers. Expanding the application of the ABWS Code to address such systems may cause unnecessary confusion. For this reason, OWM prefers maintaining the current ABWS Code as is. Perhaps a better approach to addressing these systems and the resulting gaps in NIST HB 44 requirements would be to form a small group to further study such systems and recommend NIST HB 44 changes, possibly including consideration of a separate code to address these and other types of dynamic weighing systems.

The Committee agreed to carryover this item on its 2019 agenda in a Developing status and looks forward to being able to consider a final completed version.

Regional Association Comments:

At its fall 2017 WWMA Annual Meeting, the WWMA agreed to recommend this item continue as a Developing item and understands the submitter is still working on the item. The WWMA welcomes input from other individuals on this item since there was only one comment received by the WWMA's S&T Committee during open hearings.

During the fall 2017 SWMA Annual Meeting, the SWMA's S&T Committee took comments jointly on the following items in a "batch:" 3200-1 S.1.2. Value of Scale Division Units & Appendix D (Scales); 3202-1 A. Application, S. Specifications, N. Notes, UR. User Requirements (ABWS); and New 28 A. Application and Appendix D. Definitions – batching. The SMA reported it took no position on this item. The SWMA's S&T Committee received no other comments and considered recommending this item be maintained as a Developing item; however, after further discussion, it was noted the item has been on the agenda for multiple years with little change. Consequently, the

SWMA recommended the item be withdrawn and, should the submitter want to resubmit the item, he could do so in the future.

At the CWMA's fall 2017 Interim Meeting, the Committee received testimony from Kansas stating the item is fully developed and ready for vote. The CWMA agreed and recommended this be a Voting item. At the CWMA's spring 2018 Annual Meeting, the SMA reported it takes no position on the item and the submitter, Kansas reported it believes the item is ready for vote. The CWMA recommended maintaining this item as Developing as was assigned by the NCWM S&T Committee in January 2018 until it could be voted on at the next (2019) NCWM cycle.

NEWMA's S&T Committee received no comments on this item during NEWMA's fall 2017 Interim Meeting. During NEWMA's spring 2018 Annual Meeting it was reported the submitter is still making changes to the item. NIST recommended a small working group form to study the difference in weighing single commodities in successive drafts versus automatically weighing more than one commodity in successive drafts. NEWMA recommended maintaining the Developing status at both meetings.

Additional letters, presentations, and data may have been submitted for consideration with this item. Please refer to **www.ncwm.com/interim-archive** to review these documents.

ABW-4 V A. Application and Appendix D: Definitions – batching system

(This item was Adopted.)

Source:
Richard Suiter Consulting (2018)

Purpose:
Withdraw the proposal in S&T Item 3200-1 of the Committee's 2017 agenda and replace it with a proposal to: (1) add an exception for batching systems in NIST Handbook 44 Section 2.22. Automatic Bulk Weighing Systems, and (2) add a definition for batching system to Appendix D – Definitions.

Item under Consideration:
Amend NIST Handbook 44 Automatic Bulk Weighing Systems Code as follows:

> **A.2. Exceptions. – This code does not apply to batching systems.**
>
> **A.~~2~~3. Additional Code Requirements.** – In addition to the requirements of this code, Automatic Bulk Weighing Systems shall meet the requirements of Section 1.10. General Code.

And Appendix D: Definitions

> **batching system. – One in which raw materials are proportioned in pre-determined quantities by weight and/or liquid measure for inclusion in a finished product. 2.22. 3.36.**

Background/Discussion:
Item 3200-1 on the 2017 Agenda of the NCWM S&T Committee was returned to Committee at the 2016 Annual Conference. The item failed to receive sufficient votes to either pass or be defeated. The Item was opposed by the SMA. The SMA feels the definition is for the application of a scale and not a performance application. OWM, while opposed to the addition of a definition for batching scales, acknowledged the existence of some automated weighing systems that, by virtue of their design and/or operational characteristics, fail to meet the HB 44 definition of an ABWS and, therefore, might present a challenge to those needing to determine which HB 44 requirements to apply.

The proposed definition for "batching system" is based on the definition found in SMA book of "Terms and Definitions" published in their 1981 Fourth Edition. There are many batching scales and batching systems already in the marketplace, some of which have an NTEP Certificate of Conformance. The proposed exception to the Automatic Bulk Weighing Systems Code and accompanying definition will assist weights and measures official in identifying some devices as belonging in Scales Code for evaluation and testing purposes. A search of the keyword "batching" in the NTEP certificate database provides eight pages of certificates (approximately 10 per page) that include the term "batching" on the certificate.

Some individuals believe that all automated systems utilizing a hopper scale belong in the Automatic Bulk Weighing Systems Code (ABWS). The submitter believes NTEP and the marketplace have already demonstrated there are devices and systems that do not need to meet some of the stringent requirements of the ABWS Code. These devices and systems are capable of providing accurate net weight without the necessity of some of the additional requirements of the ABWS Code. Those requirements add unnecessary additional manufacturing costs and testing burdens for weights and measures field officials.

During the 2018 NCWM Interim Meeting open hearings, the Committee received comments on this item from Mr. Henry Oppermann (Weights and Measures Consulting, LLC). In addition to providing the Committee with written comments in opposition to the item, Mr. Oppermann, commented that the proposed definition in this item is vague and incorrect, noting he supports the definition proposed in item OTH-6.

Mr. Russ Vires (Mettler-Toledo, LLC), speaking on behalf of the SMA, reported the SMA opposes the item and commented batching scales are not a commercial device and should not be defined in Handbook 44.

Mr. Richard Suiter (Richard Suiter Consulting) commented there are batching systems installed and used in commercial applications. An example of this is a concrete batching system as well as other systems where multiple materials are weighed in a single hopper. Mr. Suiter also mentioned liquid measuring applications where multiple materials are batched together to make a single product. He said he feels the term "batching system" goes beyond just scales. Mr. Suiter recommended the item move forward as Voting.

Mr. Oppermann commented that all examples can be addressed by applying the existing requirements in NIST HB 44.

Mr. Suiter then commented that the definition was only offered to help weights and measures officials define a system.

During the Committee's work session, Committee members discussed the comments received on this item and for a similar item (OTH-6). Considering that the submitter of item OTH-6 commented that that item could remain Developing or possibly be withdrawn. Committee members agreed to move this item forward as a Voting item.

At the 2018 NCWM Annual Meeting open hearings, Mr. Russ Vires (Mettler-Toledo, LLC), representing the SMA, reported that the SMA opposes this item. Batching systems are not commercial devices and should not be included in Handbook 44.

Mr. Suiter responded to Mr. Vires stating these are commercial devices. There are a number of states that register and collect fees on these devices. NIST Handbook 44 already includes many references. Mr. Suiter also provided some examples of batching scales used commercially in redi-mix concrete and feed and fertilizer operations. He noted some systems are liquid and use a bank of meters instead of scales in the "batching system."

Mr. Rick Harshman (NIST OWM) and Mr. Loren Minnich (Kansas) spoke in support of forming a small task group to examine these systems and other dynamic weighing systems. Both believe a separate HB 44 code may be needed to address some systems. Mr. Harshman stated it would be inappropriate to provide an exception in the "Application" section of the ABWS Code restricting use of ABWSs to non-batching operations as proposed. There is no rationale OWM can think of necessitating the exception proposed by paragraph A.2. Exceptions. That is, OWM sees no reason why an ABWS couldn't be used as a weighing device in a batching system. Mr. Harshman further commented it was OWM's view that the definition being offered within this item applies to a process rather than a device and OWM questions its use to describe a commercial device.

Mr. Constantine Cotsoradis (Flint Hills Resources) stated it would be helpful for the Committee to address if batching systems are considered commercial or non-commercial.

Mr. Suiter said he would support development of a new HB 44 code for batching systems, but that could take several years to develop. He noted NIST Special Publication 704 (70th NCWM Conference Report) provided indication that the S&T Committee had already concluded the ABWS Code does not apply to batching systems.

The Committee received written comments in opposition to ABW-4 from Mr. Oppermann. Mr. Opperman's comments to the Committee, stated he opposed the proposed exemption of batching systems in the "Application" section of the ABWS Code indicating the exemption was inappropriate. He also indicated the Appendix D definition of "Batching System" was incorrect and vague, which will cause more problems for weights and measures enforcement.

The Committee heard comments in support of and in opposition to this item. The Committee made no changes to the item, believes the item is fully developed, and agreed to present it for vote.

Regional Association Comments:
The WWMA recommended at its fall 2017 Annual Meeting, this item be continued as an Information item because it has merit, but was not included on the WWMA Committee's agenda, even though it was submitted on time. There was a lack of testimony on this item during open hearings due to it not being a part of the printed agenda. This item replaces Voting item 3200-1.

During the SWMA's fall 2017 Annual Meeting, the SWMA's S&T Committee took comments jointly on the following items in a "block:" 3200-1 S.1.2. Value of Scale Division Units & Appendix D (Scales); 3202-1 A. Application, S. Specifications, N. Notes, UR. User Requirements (ABWS); and New 28 A. Application and Appendix D. Definitions – batching systems. The submitter of the item, Mr. Suiter provided an overview of the item, including how the issue originated. He also displayed a picture of a sample system illustrating how one of the more modern "batching systems" are laid out. The Committee also heard comments from Mrs. Tina Butcher (NIST OWM) questioning whether a separate code addressing dynamic weighing systems might be warranted, noting that the ABWS Code didn't originally envision these new systems, but the current Scales Code may not include the necessary safeguards to automatically ensure a zero start. Mr. Suiter noted he had recommended the addition of a specification in an earlier proposal, but that was not accepted by the NCWM. He noted that there is an urgency to include something to address these systems as opposed to waiting for the development of a separate code. The SWMA recommended the item be designated as a Voting item.

At its fall 2017 Interim Meeting, the CWMA noted the definition in the proposal replaces the definition proposed in item 3200-1, which was withdrawn by the submitter. The CWMA noted it believes this definition is more appropriate and that the item is fully developed and ready for voting. The CWMA's S&T Committee noted at its spring 2016 Annual Meeting it had received written comments from the SMA and Mr. Oppermann opposing this item. Mr. Harshman commented that the proposed exception A.2. is not appropriate, and the definition now provided applies to a process rather than a commercial device. Mr. Richard Suiter commented that not all automated systems fall into the ABWS Code and need to be evaluated using the Scales Code. The CWMA agreed with Mr. Suiter and recommended the item move forward for vote.

At NEWMA's fall 2017 Interim Meeting, there were no comments received by the Committee on this item and, believing the item fully developed, NEWMA recommended it be a Voting item. At its spring 2018 Annual Meeting, a comment was heard from NIST opposing this item because the definition proposed is a generic description of a process rather than a description of a device or system. The SMA also opposed this item as batching systems are not commercial devices and should not be included in HB 44. No other comments were heard and NEWMA recommended the item be withdrawn.

Additional letters, presentations, and data may have been submitted for consideration with this item. Please refer to **www.ncwm.com/interim-archive** to review these documents.

LMD – LIQUID MEASURING DEVICES

LMD-2 V S.1.6.7. Recorded Representation, S.1.6.8. Recorded Representations for Transactions Where a Post-Delivery Discount(s) is Provided. and UR.3.4. Printed Ticket

(This item was adopted)

Source:
Morrow County, Carroll County and Stark County, Ohio (2017)

Purpose:
Require that printed receipts declare an alpha or numeric pump designation that coincides with the dispensing device used for a specific transaction.

Item under Consideration:
Amend NIST Handbook 44 Liquid Measuring Devices Code as follows:

Note: The Item under Consideration was modified by the developer for 2018.

S.1.6.7. Recorded Representations. – *Except for fleet sales and other price contract sales and for transactions where a post-delivery discount is provided, a printed receipt providing the following information shall be available through a built-in or separate recording element for all transactions conducted with point-of-sale systems or devices activated by debit cards, credit cards, and/or cash:*

(a) *the total volume of the delivery;******

(b) *the unit price;******

(c) *the total computed price; ***~~and~~***

(d) *the product identity by name, symbol, abbreviation, or code number.*** and***

(e) the dispenser designation by either an alpha or numerical description. **

*******[Nonretroactive as of January 1, 1986]* *****[Nonretroactive as of January 1, 2021***
(Added 1985) (Amended 1997, 2012, ~~and~~ 2014, **and 2018**)

S.1.6.8. Recorded Representations for Transactions Where a Post-Delivery Discount(s) is Provided. – Except for fleet sales and other price contract sales, a printed receipt providing the following information shall be available through a built-in or separate recording element that is part of the system for transactions involving a post-delivery discount:

(a) the product identity by name, symbol, abbreviation, or code number;

(b) transaction information as shown on the dispenser at the end of the delivery and prior to any post-delivery discount(s), including the:

(1) total volume of the delivery;

(2) unit price; and

(3) total computed price of the fuel sale.

(c) an itemization of the post-delivery discounts to the unit price; ~~**and**~~

(e) the final total price of the fuel sale after all post-delivery discounts are applied~~.~~**, and**

(f) ***The dispenser designation by either an alpha or numeric description.***

(Added 2012) (Amended 2014**and 2018**) [***Nonretroactive as of January 1, 2021]***

And

UR.3.4. Printed Ticket. - The total price, the total volume of the delivery, ~~**and**~~ the price per liter or gallon, ***and a corresponding alpha or numeric dispenser designation**** shall be shown, either printed by the device or in clear hand script, on any printed ticket issued by a device and containing any one of these values.

(Amended 2001 **and 2018**) ***(Nonretroactive January 1, 2021)***

Background/Discussion:

Note: This agenda item appeared on the Committee's 2017 agenda as Agenda Item 3300-2.

This item was first proposed in 2017 and given an Information status by the S&T Committee. The submitters, assigned to develop the item, have made modifications to the original proposal, adding changes to paragraphs S.1.6.7. Recorded Representations and S.1.6.8. Recorded Representations for Transactions Where a Post-Delivery Discount(s) is Provided. The previous Item under Consideration was as follows:

UR.3.4. Printed Ticket. – **This requirement applies only to devices that are capable of issuing a printed ticket.** The total price, the total volume of the delivery, **a corresponding alpha or numeric dispenser designation** and the price per liter or gallon shall be shown, either printed by the device or in clear hand script, on any printed ticket issued by a device and containing any one of these values.

(Amended 2001 **and 20XX)**

The consumer and weights and measures official would be able to verify that all transaction information corresponds accurately at locations with multiple dispensers on site. If no pump designation is on the receipt, it hinders the consumer's ability to know that they were given the correct receipt for the transaction. Similarly, a pump designation on the receipt will asset weights and measures in verifying correct communication between devices as well as follow-up as needed in case of a consumer complaint.

Adding this language will bring this section in line with paragraphs S.1.6.7. and S.1.6.8.

The submitter recognizes that software updates would be required for those establishments that do not already meet this proposed amendment. In discussion with Mr. Gordon Johnson (Gilbarco Inc.), he indicated that industry would be able to accomplish the software updates in 2 -3 years if the amendment was passed.

During the 2017 NCWM Interim Meeting S&T Committee's open hearings, Mrs. Tina Butcher (NIST OWM) noted that paragraph UR.3.4. Printed Ticket was originally added to NBS Handbook 44 in 1967 at the request of industry to address technology limitations which would have made it impractical from a cost perspective to print all three values (i.e., total price, total volume of delivery, and the price per liter or gallon). She said one question that might be considered given today's technology is whether the provision to allow values to be written in hand script is still appropriate or if a system that is capable of providing a printed ticket should be required to print all of the values. She also this item didn't propose corresponding amendments to paragraphs S.1.6.7. or S.1.6.8. To this point, she indicated that the Committee may want to consider recommending changes to those two requirements to align the requirements for printed receipts. As a final comment, she said, should the Committee decide to recommend paragraph UR.3.4. be changed, it may want to reorganize the paragraph so it is clearer and intended only to apply to devices that issue a printed ticket. She provided the Committee a revised version of the paragraph, which had been developed by members of OWM's Legal Metrology Devices Program for the Committee to consider.

Mr. Dmitri Karimov (Liquid Controls), speaking on behalf of the MMA reported that the MMA supported the NIST observations.

During the Committee's work session, members of the Committee agreed to replace the submitter's version of the proposal with the revised version offered by NIST and present the item for vote at the upcoming NCWM Annual Meeting. Refer to the Committee's 2017 Final Report to view both the submitter's version of the proposal and the revised version developed by OWM's LMDP that replaced it.

At the Committee's 2017 NCWM Annual Meeting open hearings, Mrs. Tina Butcher (NIST OWM) reiterated comments provided by OWM during the 2017 Interim meeting. She said OWM understands the benefit of identifying the alpha or numeric designation of the dispenser on printed receipts, but questions given today's technology why a provision for providing the customer the required information in hand script is needed. She suggested that specification paragraphs S.1.6.7. and S.1.6.8 (which include requirements for printed receipts) should also include provisions for the dispenser designation, providing this information is deemed beneficial to inspectors and consumers. The proposed paragraph UR.3.4. would require users to hand print this information on receipts even on devices which comply with the current S.1.6.7. and S.1.6.8. The printer should be capable of printing all the values.
Mr. Dmitri Karimov (Liquid Controls), speaking on behalf of the MMA, recommended that the item status be changed to Information so that the specification and existing user requirement paragraphs can be revised. Additional consideration needs to be given in the drafting of the changes proposed to paragraph UR.3.4. to wholesale versus retail applications.

Based on comments received during the open hearings, the Committee felt the submitter should consider modifying specification paragraphs S.1.6.7. and S.1.6.8. of the LMD Code and the existing user requirement. Based on these needed amendments, the Committee decided to change the status of the item from Voting (V) to Developing (D).

At the 2018 NCWM Interim Meeting open hearings the Committee heard comments from Mr. Nick Owens (Stark County, OH) and Mr. Gordon Johnson (Gilbarco, Inc.). Mr. Owens, one of the three original submitters, stated that the item is fully developed and is ready to move forward as a Voting item. He questioned the membership on if there were concerns with the 2021 non-retroactive dates proposed as part (e) of paragraph S.1.6.7. Recorded Representations and part (f) of paragraph S.1.6.8. Recorded Representations for Transactions Where a Post-Delivery Discount(s) is Provided. Mr. Johnson responded by saying he had no concern with the non-retroactive date. The item will require some updates by retailers/owners of devices.

The Committee assigned this item Voting status.

During the 2018 NCWM Annual Meeting open hearings, the Committee heard comments on this item from Mrs. Butcher and Mr. Tom Konst (Carroll County, Ohio and one of three co-submitters of the item). Mrs. Butcher reported OWM concurs providing the dispenser designation on the printed ticket may be beneficial to the consumer and official and that the addition of the proposed changes to paragraphs S.1.6.7. and S.1.6.8. make the proposal more complete and help ensure systems can print the information. She reviewed the history of the evolution of paragraph UR.3.4. as noted earlier in this report and noted OWM continues to question whether, given today's technology, the provision to allow the remaining values to be written in hand script is still appropriate.

Mrs. Butcher also identified a concern OWM had with the proposal, which she said needed to be addressed. The concern is there's a conflict created from the nonretroactive dates currently specified in the proposal. The proposed changes to paragraphs S.1.6.7. and S.1.6.8. are nonretroactive as of January 1, 2021. In 2021, it is proposed that paragraph UR.3.4. is to become retroactive, but the requirements in paragraphs S.1.6.7 and S.1.6.8. will remain nonretroactive. Users of systems not subject to the nonretroactive requirements in S.1.6.7. and S.1.6.8. would be forced to hand-write the information if their equipment is not able to print it. Mrs. Butcher further reported that the submitter of the item had suggested at the spring 2018 CWMA Annual Meeting making the proposed addition to UR.3.4. nonretroactive as of 2021 to eliminate this conflict. She suggested the Committee might alternatively consider deleting the proposed changes to UR.3.4. from the Item Under Consideration since the equipment will be capable of printing the information at that point.

Mr. Konst commented that he supported changing paragraph UR.3.4. of the proposal to reflect the changes proposed to the paragraph are to be nonretroactive as of January 1, 2021 and to coincide with the nonretroactive dates proposed in the two specification paragraphs S.1.6.7. and S.1.6.8. He then requested the Committee make the editorial change to the paragraph by replacing the word "retroactive" with "nonretroactive."

During its work session, members of the Committee agreed to amend paragraph UR.3.4. of the proposal by specifying a "nonretroactive" date rather than a "retroactive" date as suggested by Mr. Konst. The following reflects the version of paragraph UR.3.4. that appears in the Committee's 2018 Interim Report - NCWM Publication 16, which was changed by the Committee to that shown in Item Under Consideration:

> **UR.3.4. Printed Ticket.** - The total price, the total volume of the delivery, ~~**and**~~ the price per liter or gallon, ***and a corresponding alpha or numeric dispenser designation**** shall be shown, either printed by the device or in clear hand script, on any printed ticket issued by a device and containing any one of these values.
>
> (Amended 2001 **and 2019**) ***(*Retroactive January 1, 2021)***

No additional changes were made to the proposal and the Committee agreed to present the item for vote with these modifications.

Regional Association Comments:
During the fall 2017 WWMA Annual Meeting, this item was originally presented by the Committee in the voting session as a Voting item on the voting consent calendar. Mr. Ron Hasemeyer (Alameda County, CA) asked for it to be removed from the consent calendar during discussion in the voting session. It was removed and voted upon individually, and the vote failed. The Committee briefly met during a recess in the voting session and agreed that this item should move forward as a Developing item. This was presented when the voting session resumed, and the recommendation passed.

At the fall 2017 SWMA Annual Meeting, the SWMA's S&T Committee received no comments on this item. The Committee acknowledged the submitter had modified the proposal from the original (which only proposed changes to the user requirement paragraph UR.3.4.) to include proposed changes to two specifications paragraphs, S.1.6.7. and S.1.6.8. During its work session, the Committee acknowledged there was general support during the Measuring Sector's recent meeting for including identifying information for the pump on printed tickets/receipts, but there should be accompanying requirements in the "Specifications" section of the code. Given the item has been updated (to include proposed specifications) based on comments received during the NCWM meetings and there were no comments during the SWMA meeting, the SWMA recommended this item as a Voting item.

At the fall 2017 CWMA Interim Meeting, the submitter of the item reported he believes the item is ready for vote and the CWMA agreed to recommend the item move forward for vote. At the CWMA's spring Annual Meeting, the submitter noted that the changes proposed to paragraph UR.3.4. were intended to be nonretroactive and proposed replacing the word "*Retroactive*" with the words *"Nonretroactive as of."* The CWMA agreed to recommend the item be presented for vote at the 2018 NCWM Annual Meeting with this editorial change to specify a nonretroactive date.

> **UR.3.4. Printed Ticket.** - The total price, the total volume of the delivery, ~~**and**~~ the price per liter or gallon, ***and a corresponding alpha or numeric dispenser designation**** shall be shown, either printed by the device or in clear hand script, on any printed ticket issued by a device and containing any one of these values.
>
> ***(Nonretroactive as of ~~Retroactive~~ January 1, 2021)***
>
> **(**Amended 2001 and 2019**)**

During the fall 2017 NEWMA Interim Meeting, NEWMA's S&T Committee received no comments on this item and NEWMA reported it believes the item has been fully developed, has merit, and is ready for a vote. At NEWMA's spring 2018 Annual Meeting, comments were heard recommending the item be nonretroactive in order to prevent hand-written tickets on all the pumps unable to include numbers on printed tickets or on pumps that do not print tickets. NIST comments were that the changes proposed to paragraph UR.3.4. Printed Ticket should be "Nonretroactive as of January 1, 2021" instead of "Retroactive," as proposed. NEWMA agreed and recommended the item move forward for a vote with the change suggested by OWM to paragraph UR.3.4.

Additional letters, presentations, and data may have been submitted for consideration with this item. Please refer to **www.ncwm.com/interim-archive** to review these documents.

LPG – LPG AND ANHYDROUS AMMONIA LIQUID-MEASURING DEVICES

LPG-3 D S.2.5. Zero-Set-Back Interlock, Stationary and Vehicle Mounted Meters, Electronic

Source:
Maryland (2018)

Purpose:
To align the LPG Code with the VTM Code for electronic registers/indicators used in stationary and mobile applications.

Item under Consideration:
Amend NIST Handbook 44 LPG and Anhydrous Ammonia Liquid-Measuring Devices Code as follows:

> ***S.2.5. Zero-Set-Back Interlock, Stationary and Vehicle Mounted Meters, Electronic. – A device shall be so constructed that after an individual or multiple deliveries at one location have been completed, an automatic interlock system shall engage to prevent a subsequent delivery until the indicating and, if equipped, recording elements have been returned to their zero position. For individual deliveries, if there is no product flow for three minutes the transaction must be completed before additional product flow is allowed. The 3-minute timeout shall be a sealable feature on an indicator.***
>
> ***(Added 20XX) (Nonretroactive as of 20XX)***
>
> ***S.2.6~~5~~. Zero-Set-Back Interlock for Stationary Retail Motor-Fuel Devices.*** *– A device shall be constructed so that:*

…

Renumber remaining paragraphs

Background and Discussion:
This specification has been in place for VTMs for many years. Its purpose is to prevent a second party from being charged for product delivered to the first party. However, there is no requirement for interlocks in the LPG Code, other than the requirement added in 2016 for stationary retail motor fuel devices. Currently, the only protection is provided by two User Requirements paragraphs, UR.2.5. Ticket in Printing Device, which prohibits the "riding of tickets" (having a ticket in the printer while the vehicle is moving from one location to another) and UR.2.1. Return of Indication and Recording Element to Zero, which requires the indications to be set to zero before a delivery. Both of these requirements are extremely difficult, if not impossible to enforce where printers are frequently mounted in the cab of the vehicle and are not visible to an observer outside the vehicle.

In addition, electronic registers used in stationary applications shall not be exempt from this requirement due to the possibility of a second party being charged for product delivered to the first party in this scenario as well.

This requirement for electronic indicators already exists in the VTM Code and being as the majority of electronic registers are used in both applications, the submitter cannot see any objections as to why this requirement should be added to the LPG and Anhydrous Ammonia Liquid-Measuring Device Code.

During the 2018 NCWM Interim Meeting, the Committee received the following comments on this item during the open hearings:

Mr. Ken Ramsburg (Maryland) stated that he believes this is "harmonizing the LPG and NH_3 Code with the VTM Code."

Mr. Dmitri Karimov (Liquid Controls), speaking on behalf of the Meter Manufacturers Association (MMA), stated that the MMA supports and agrees with the proposed NIST language shown in the written analysis provided by OWM to the Committee and NCWM.

Mr. Mike Sikula (New York), stated that he supports the proposal even though he hasn't seen the NIST language.

The proposed new paragraph is intended to be nonretroactive, although the submitter of the item did not propose an effective date.

During the Committee's work session, members of the Committee felt that the nonretroactive date needed to be included before the item could be advanced to a Voting status. The Committee elected to maintain the item on its agenda as Developing pending agreement of an effective date.

The Committee did not take comments during open hearings on Developing items at the 2018 NCWM Annual Meeting except to grant the submitter of a Developing item (or block of Developing items) an opportunity to provide an update on the progress made to further develop the item(s) since the 2018 NCWM Interim Meeting. There were no comments or updates provided on this item by the submitter at the Annual meeting.

OWM provided the following written recommendations and comments to this item as feedback to the submitter and as part of its analysis of the S&T Committee's 2018 agenda items:

> OWM reiterates its comments included in the analysis it provided to the Committee at the January 2018 Interim Meeting. OWM agrees with the submitter that additional requirements should be added to the LPG Code for a zero-set-back interlock for electronic stationary (other than stationary retail motor fuel dispensers) and vehicle-mounted meters. OWM recommends adding a parenthetical to the title to limit the application of the new paragraph to stationary meters that are not used in retail motor-fuel applications; this will eliminate redundancy and help avoid confusion over how the **existing** paragraph S.2.5. Zero-Set-Back Interlock for Stationary Retail Motor-Fuel Devices (which includes similar requirements to the proposed new paragraph) would apply.
>
> The last sentence of proposed **new** paragraph S.2.5. (S.2.5. Zero-Set-Back Interlock, Stationary (other than Stationary Retail Motor-Fuel Dispensers) and Vehicle-Mounted Meters, Electronic) includes a time-out limit. OWM agrees a time-out specification is appropriate; however, OWM suggests this be addressed in a separate paragraph. During our analysis, we noted that a new paragraph (S.1.6.10. Automatic Timeout, Pay-at-Pump Retail Motor-Fuel Devices) was added to the LMD Code in 2017, specifying an automatic timeout for retail motor-fuel applications where payment is rendered via a card at the dispenser; however, a corresponding paragraph to address LPG systems used in RMFD applications was not added at the same time. In keeping with the S&T Committee's past efforts to align requirements for RMFDs in the LMD Code and the LPG & Anhydrous Ammonia Liquid-Measuring Devices Code, OWM suggests the Committee consider adding another paragraph to the proposal to mirror this requirement in the LMD Code. By moving the timeout limit in the proposed **new** paragraph S.2.5. into a separate paragraph (S.2.6. Automatic Timeout, Stationary (Other than Stationary Retail-Motor Fuel Dispensers), the format of requirements for (1) zero-set-back interlock requirements and (2) timeout provisions will be consistent for stationary retail motor-fuel dispensers and other types of stationary devices.
>
> Thus, OWM offers the following alternate proposal for the submitter's consideration as the item is further developed. OWM concurs with comments from the 2018 Interim Meeting regarding the need to propose a specific nonretroactive date to allow for interested parties the opportunity to consider the effective date.
>
> > **S.2.5. *Zero-Set-Back Interlock, Stationary (Other than Stationary Retail Motor-Fuel Dispensers) and Vehicle-Mounted Meters, Electronic. - A device shall be so constructed that after an individual or multiple deliveries at one location have been completed, an automatic interlock system shall engage to prevent a subsequent delivery until the indicating and, if equipped, recording elements have been returned to their zero position.***
> >
> > ***(Added 20XX) (Nonretroactive as of 20XX)***

S.2.6. Automatic Timeout, Stationary (Other than Stationary Retail Motor-Fuel Dispensers) and Vehicle-Mounted Meters, Electronic. For individual deliveries, if there is no product flow for three minutes the transaction must be completed before additional product flow is allowed. The 3-minute timeout shall be a sealable feature ~~on~~ of an indicator.

(Added 20XX) (Nonretroactive as of 20XX)

S.2.7~~.~~ Zero-Set-Back Interlock for Stationary Retail Motor-Fuel Devices. *– A device shall be constructed so that:*

…

S.2.8. ***Automatic Timeout Pay-at-Pump Retail Motor-Fuel Devices. – Once a device has been authorized, it must de-authorize within two minutes if not activated. Re-authorization of the device must be performed before any product can be dispensed. If the time limit to de-authorize the device is programmable, it shall not accept an entry greater than two minutes.***

(Added 20XX) (Nonretroactive as of 20XX)

…

Renumber remaining paragraphs.

After a brief discussion, the Committee felt the item was important to harmonize the LPG requirements between measuring codes and agreed to carryover this item on its agenda as a Developing item.

Regional Association Comments:
At its fall 2017 Annual Meeting, the WWMA agreed to recommend this item be carried forward as a Developmental item, with the desire to hear input from the other regions in addition to hearing from industry including the MMA.

At the fall 2017 SWMA Annual Meeting, the Committee heard comments from the submitter of this item, Mr. Ramsburg who noted that the purpose of the proposal is to align the LPG & NH3 Code with requirements already included in the Vehicle-Tank Meters Code. No comments were received in opposition to the proposal and the SWMA recommended the item be forwarded as a Voting item on the NCWM's agenda.

There were no comments received opposing this item at the CWMA's fall 2017 Interim Meeting and the CWMA recommended the item move forward as Voting, noting the language in the proposal already exists in HB 44. The CWMA's S&T Committee noted it appreciates the work of OWM in clarifying these items. No comments were heard on this item at the CWMA's spring 2018 Annual Meeting and the CWMA recommended the item as a Developing item on the NCWM agenda.

At its fall 2017 Interim Meeting, NEWMA recommended the item move forward as a Voting item noting there was some clarification provided on the purpose of the item and that it believes the item has been fully developed. During the spring 2018 NEWMA Annual Meeting, a comment included support for the item but recommended an editorial change to use expression in the same manner as the code includes both "three minutes" and "3-minute." NIST recommends that additional requirements should be added and further developing needs to be done. NEWMA recommended the item remain developing.

Additional letters, presentations, and data may have been submitted for consideration with this item. Please refer to **www.ncwm.com/interim-archive** to review these documents.

LPG-4 D N.3. Test Drafts.

Source:
Endress + Hauser Flowtec AG USA (2015)

Purpose:
Allow transfer standard meters to be used to test and place into service dispensers and delivery system flow meters.

Item under Consideration:
Amend NIST Handbook 44 LPG and Anhydrous Ammonia Liquid-Measuring Devices as follows:

N.3. Test Drafts.

N.3.1 Minimum Test - Test drafts should be equal to at least the amount delivered by the device in 1 minute at its normal discharge rate.
(Amended 1982)

N.3.2. Field Reference Standard Meter Test. – The minimum quantity for any test draft shall be equal to or greater than the amount delivered in one minute at the flow rate being tested.
(Added 20XX)

Background/Discussion:

Note: This agenda item was modified by the developer on September 8, 2017. It previously appeared on the Committee's agenda as Agenda Item 332-2 in 2015, 332-5 in 2016, and 3302-1 in 2017.

The use of "transfer standards" is recognized in Code sections 3.34 Cryogenic Liquid-Measuring Devices Code; 3.38 Carbon Dioxide Liquid-Measuring Devices Code; and 3.39 Hydrogen Gas-Measuring Devices – Tentative Code. The term "transfer standard" is only defined for testing cryogenic liquid measuring devices. It has been pointed out that the term is incorrect and field reference standard meters may be more appropriate. See the new Item under Consideration, as updated on September 8, 2017.

Field evaluation of LPG meters and CNG dispensers and LNG dispensers is very difficult using volumetric and gravimetric field standards and methods. The tolerances for these applications are such that using field reference standard meters are more efficient and safer. With CNG and LNG and LPG applications, the field reference standard meters are placed in-line with the delivery system as it is used to fill tanks and vehicles. The use of field reference standard meters eliminates return to storage issues. The use of field reference standard meters is easier and faster compared to the use of traditional field standards. The cost of using field reference standard meters and transporting them is much less than the cost of traditional field provers and standards.

Recognition in NIST HB 44 will enable States to allow field reference standard meters to place systems into service and for field enforcement.

Volumetric field provers and gravimetric field proving are susceptible to environmental influences. The State of Colorado uses a field reference standard meter to test propane delivery truck meters. The State of Nebraska has used a field reference standard meter to test agricultural chemical meters. Other States have asked that there be recognition in NIST HB 44 in order for their State to allow the use of field reference standard meters.

In some applications, field reference standard meters are not more accurate than the meters used in the application. For that reason, longer test drafts and possibly more tests may need to be run.

The State of California is purported to have conducted a short study of field reference standard meters in the past. The conclusion did not lead to wide adoption of the practice.

Section 3.37 Mass Flow Meters user requirement U.R.3.8. Return of Product to Storage, Retail Compressed Natural Gas Dispensers requires that the natural gas which is delivered into the test container must be returned to storage. This is difficult and most often not complied with when the test vessel contents are released to atmosphere. States often have difficulties in remote locations finding suitable field reference equipment.

The Committee initially considered a proposal to modify current paragraph N.3. Test Drafts and to add a new paragraph N.3.2. Transfer Standard Test as shown below.

N.3. Test Drafts. –

<u>N.3.1 Minimum Test -</u> Test drafts should be equal to at least the amount delivered by the device in one minute at its normal discharge rate.

(Amended 1982)

<u>N.3.2. Transfer Standard Test. – When comparing a meter with a calibrated transfer standard, the test draft shall be equal to at least the amount delivered by the device in 2 minutes at its maximum discharge rate.</u>

In October of 2016, Mr. Keilty (submitter) submitted a new NCWM Form 15 to the NCWM proposing changes to the text that had originally been submitted for proposed new paragraph N.3.2. Transfer Standard Test. This updated version of his proposal is as shown in Item under Consideration of this report and first appeared on the Committee's agenda for the 2017 NCWM Interim Meeting (i.e., 2017 NCWM Publication 15).

The submitter recommended that NIST update EPO 28 for CNG dispensers and EPO 26 for LPG Liquid Measuring Systems to include transfer standard meter tests. NIST Handbook 105-4 should also be revised to specifically address the transfer standard meter and the requirements for use.

The S&T Committee might also consider amending Sections 3.30 Liquid-Measuring Devices Code and 3.31 Vehicle-Tank Meters Code to allow transfer standard meters.

At the 2015 NCWM Interim and Annual Meetings, the Committee received comments both in support of and in opposition to the proposal outlined in this item and a corresponding item in the Mass Flow Meters Code. Mr. Mike Keilty (Endress + Hauser Flowtec AG USA), submitter of these two items, outlined the benefits of using a master meter as a standard in testing application such as CNG, LNG, and LPG. The Committee heard comments in opposition to the proposal from Mr. Henry Oppermann (Weights and Measures Consulting, LLC), speaking on behalf of himself, as well as Seraphin Test Measure, Co. Mr. Oppermann noted there are significant differences between a transfer standard and a field standard. Mrs. Tina Butcher (NIST OWM) acknowledged the advantages to identifying and developing alternate test methods such as this but noted that simply adding the proposed language doesn't address the multiple other elements that need to be in place to ensure traceability; OWM provided a list of those elements along with other suggestions. OWM noted that the USNWG on Alternative Test Methods might be a better venue to develop the elements to support the use of these devices. This was echoed by Mr. Dmitri Karimov (Liquid Control, LLC) who also commented that the regulatory authority must assess the suitability of a given standard. The Committee also heard from Ms. Kristin Macey (California) who commented that if the proposal were adopted, it would allow use of a transfer standard and California would not be able to fully support it, citing results of comparison testing conducted by CA in which the master meter performed worst of the three methods examined. Mr. Keilty, in response to Mrs. Butcher's and Mr. Oppermann's comments, stated that he agreed completely and noted that adding the paragraph to these two codes is a step towards allowing the use of transfer standards and it's understood there are many things that would need to be in place in order that they be considered suitable for use in testing. The Committee also heard other comments from regulators and industry supporting the continued development of this issue. The Committee agreed that the item has merit but needs further development and suggested the submitter work with OWM by providing data for the USNWG to consider.

See the Committee's 2015 Final Report for details.

At the 2016 NCWM Interim and Annual Meetings, the Committee again heard comments both in support of and in opposition to this item and the corresponding item in the Mass Flow Meters Code. Mr. Michael Keilty (Endress + Hauser Flowtec), the submitter, stated that he supported this item as a Voting item as did Alan Walker (Florida). Others expressed support of the item but noted the need for additional development. The Committee heard again from Mrs. Tina Butcher and Mr. Henry Oppermann, who reiterated their 2015 detailed comments regarding the tasks that need to be completed before considering changes to Handbook 44. Both echoed the need to collect data in order to properly evaluate whether or not a master meter could be considered a suitable standard.

During its Interim Meeting work session, the Committee acknowledged comments suggesting the need for additional test data. It was also acknowledged that there was a lot of support for the proposal. Those supporting the proposal had indicated that using a transfer standard is much easier and faster than testing gravimetrically and eliminates the need to discharge product from a prover into the atmosphere, which is viewed by many as a safety concern. Given that the addition of the proposed language would not dictate the method of testing and the decision on whether or not to use a particular method of testing would remain with each jurisdiction, the Committee agreed to present both items for vote at the Annual Meeting.

At the 2016 NCWM Annual Meeting, the Committee received numerous comments from industry and regulators alike, predominantly in support of the proposals. These comments cited benefits such as safety; faster and more efficient testing; and lack of problems with using master meters. Mr. Marc Buttler (Emerson Process Management – Micro Motion) also expressed supports of the items but suggested replacing the words "maximum discharge rate" with "maximum test rate" in proposed paragraph N.3.2.; the submitter agreed with the suggestion.

The Committee also heard comments in opposition to the item and comments emphasizing the need for further development and data. A new comment offered by Mrs. Tina Butcher (NIST OWM) noted that the proposed new paragraph N.3.1. would create a conflict with the minimum test procedures outlined in the NIST EPO for CNG dispensers since tests conducted at the MMQ and at some other quantities are frequently completed in less than one minute. There was also some debate regarding the application of the Fundamental Considerations with regard to the allocation of error and uncertainty associated with a given test method and Mr. Henry Oppermann clarified the proper application of these criteria. Mr. Oppermann noted that transfer standards, in some cases, are no more accurate than the meter being tested and that the proposals lack a specification associated with the performance of the standard. He recommended the items be downgraded to Informational or Developing.

During the Committee's work session, members of the Committee agreed that the comments received during the open hearings were mostly in support of the two proposals. The Committee discussed the proposed changes to the text, including the errors in the transcription of the text in the Item Under Consideration. The Committee discussed the potential impact on testing CNG dispensers, acknowledging that the proposed requirement cannot be met by someone wanting to apply the procedures in the NIST EPO (which were developed through a work group comprised of industry and regulatory officials). Some Committee members familiar with CNG testing concurred that a test run typically takes less than one minute to complete. The Committee was concerned with the potential conflict and questioned whether the submitter had fully considered the impact of the proposed language. These discussions led the Committee to decide to change the status of the item from Voting to Developmental and return them to the submitter for further development.

See the Committee's 2016 Final Report for details.

Just prior to the 2017 NCWM Interim Meeting, the Committee agreed to amend the proposal in Agenda Item 3302-1 to that shown in Item under Consideration of the Committee's 2017 Final Report at the request of Mr. Michael Keilty (Endress & Hauser Flowtec AG USA), submitter of the item. The Committee chairman, Dr. Matthew Curran (Florida) announced during open hearings of the Committee at the 2017 NCWM Interim Meeting that the proposal had been changed and that the revised version had been posted on NCWM's website.

During the 2017 NCWM Interim Meeting, the Committee grouped Agenda Item 3302-1 and 3307-2 together and took comments on these items simultaneously because it considered these items related.

Mr. Michael Keilty (Endress & Hauser Flowtec AG USA), submitter of the item, commented this was a Voting item at the 2016 NCWM Annual Meeting at which time it was downgraded to a Developing status. He further offered the opinion that there was not a good mechanism for relaying back to the submitter what an item needs in the way of development. Having now submitted the item with amended language, he said that he would like to see this item put to a vote.

As was the case during open hearings of the Committee in 2015 and 2016, similar comments were received both in support of and in opposition to this item and the corresponding item in the Mass Flow Meters Code in 2017.

Mrs. Tina Butcher (NIST OWM) spoke of the need for standards used in testing to comply with the tolerances for standards specified in NIST HB 44 Appendix A - Fundamental Considerations which, she noted, requires the combined error and uncertainty of any standard used without correction to be less than one-third the applicable device tolerance. She also made evident the potential for more than one type of standard to be used in testing, noting that the tolerances specified the Carbon Dioxide Liquid-Measuring Devices Code of NIST HB 44 increase for different test methods. She stated that the proposal seemed to address only one particular type of transfer standard, i.e., a master meter, and, as a result, the proposal could have a very limiting effect on the types of transfer standards that can be used. She also questioned the use of the term “transfer standard” and suggested that the term, “field standard” may be a more appropriate term. As a final comment, she reiterated a previous OWM comment that more data is needed of comparisons to known standards.

Mr. Bruce Swiecicki (National Propane Gas Association), Mr. Constantine Cotsoradis (Flint Hills Resources), and Mr. Hal Prince (FL), commented in support of the item and requested the item move forward.

Mr. Ross Andersen (New York, retired) gave an example of alternative test methods being used for like applications, such as what the ASTM does. He stated that different test methods will have different results and that variables of those methods need to be evaluated. He commented that we are currently evaluating only one variable.

In consideration of the comments received on these two items, the Committee agreed to present them for vote at the 2017 NCWM Annual Meeting.

At the 2017 NCWM Annual Meeting, the Committee again grouped this item with Agenda Item 3307-2 and took comments on the two items at the same time. Several industry and regulatory officials voiced support to presenting the two items for vote. Some of those speaking in support of the items acknowledged that a lot of additional work still needed to be completed to confirm the adequacy of alternative test measures, such as a master meter, for use as a standard in testing commercial devices. The Committee was urged by some, however, to present the items for vote, noting that some states are already using alternative standards for testing and that the additional work needed to confirm their adequacy can be completed post adoption of the proposals.

There were also several who spoke in favor of maintaining the Developing status of the items. Mr. Steve Harrington (OR), for example, reported that the State of Oregon is pursuing the use of a mass flow meter standard for use in testing LPG meters. He noted that additional work is needed to develop procedures that will confirm the adequacy of the mass flow meter (standard) for use in testing LPG meters used in commercial applications. He recommended maintaining the Developing status of the items.

Mrs. Tina Butcher (NIST OWM) reported that OWM believes the proposed changes are premature. More work is needed and OWM recommends maintaining the items as Developing. Mrs. Butcher provided an update on some ongoing work relating to alternative test methods and the current proposals under consideration as follows:

- The NTEP Measuring Sector is developing guidelines for type-evaluation laboratories when conducting type evaluation using alternative types of standards.

- NIST OWM has established a USNWG to examine alternative test methods.

- The USNWG subgroup has been working to establish uncertainties for select test methods and examining data from some field tests.
- The Subgroup has developed guidelines for collecting measurement data.
- The guidelines can be used by equipment manufacturers and/or W&M jurisdictions to collect data to examine different test methods and types of test standards.
- Guidelines include tasks such as:
  - Developing a test protocol for collecting data and for identifying testing factors that may contribute the largest uncertainties in testing;
  - Following guidelines for data collection;
  - Collecting sufficient data under a similar variety of user conditions;
  - Identifying the major factors that could affect test results and contribute the largest uncertainties in testing;
  - Ensuring that Handbook 44 and EPOs are updated and available for its use;
  - Making all results and assessments accessible to States and other enforcement agencies; and
  - Publish an updated NIST 105 Series and calibration procedures, if not available.

- OWM is in the process of developing a proposal to address the use of the term "transfer standard" throughout HB 44. According to NIST HB 130, the International Vocabulary of Metrology, and references in HB 44 Fundamental considerations, the reference in the current proposals should be "field standard." OWM plans to submit the proposal for consideration during the 2018 NCWM cycle.

Mrs. Butcher also noted that OWM has a significant concern with the proposal in Agenda Item 3307-2 because proposed new paragraph N.3.1. conflicts with the minimum test of a CNG RMFD being performed today in accordance with the NIST EPO. A test conducted at the MMQ typically takes far less than a minute to complete. Additionally, the test drafts performed at one-third, two-thirds, and three-thirds test tank capacity often are completed in less than a minute's time.

Mrs. Butcher also reiterated many of the points OWM had provided in previous NCWM Meetings relating to these two proposals. The following is a short summary of these points:

- The development of alternative methods of testing commercial metering systems is an important issue. Many applications, in which using currently recognized test methods, may be not be feasible because of product characteristics, safety, cost, access to equipment, and other factors.
- Modifying HB 44 as proposed doesn't ensure approval of any proposed test method. The decision on whether or not to accept a particular test method rests with the regulatory authority.
- Many things must be considered when selecting and determining the suitability of field standards to provide traceable measurements. These are sometimes referred to as the "essential elements of traceability." The following are some examples:
  - accuracy of a particular test standard relative to the applicable tolerance;
  - demonstrated reliability of the device over time;
  - device repeatability;

  - how well it duplicates actual use;
  - existence of documentary standards for the test equipment;
  - availability of equipment/facilities within a state lab to test the equipment; and
  - whether training has been provided for the lab staff, field officials, and users of the equipment.

- NIST HB 44 Fundamental Considerations, Section 3.2. Tolerances for Standards, specify that when a standard is used without correction, its combined error and uncertainty must be less than one-third of the applicable tolerance.
- The current proposal seems to simply borrow from other codes without technical rationale. There is a potential for more than one type of alternative test method. The current proposal may unintentionally limit other types.
- Even within the category of "master meters," different requirements may be needed for different master meter technologies in order to comply with this requirement.
- Should consideration be given to providing a larger tolerance when conducting tests using a particular test method as is done in the carbon dioxide and hydrogen codes? Testing would need to be conducted to demonstrate the magnitude of the additional tolerance.
- W&M needs a system that results in:
  - manufacturers knowing the requirements for the design of the standard;
  - systematic and appropriate collection of measurement data on proposed standards;
  - states (regulatory authority) having access to the measurement data; and
  - side-by-side testing to compare results with existing test methods.
- Additional data and analysis is needed prior to recommending specific language for adoption in HB 44.

Mr. Henry Oppermann, (Weights and Measures Consulting, LLC) speaking on his own behalf, as well as consultant for Seraphin Test Measure, Co. stated there is no clear understanding of the terms "field standard" and "transfer standard." Any standard proposed for use in testing must meet the tolerances for standards specified in the Fundamental Considerations (Appendix A) of NIST HB 44 and there must be proof that the standard is able to comply with the tolerance over a range of field conditions. He raised the question, "without data to support the accuracy of a standard, how do you know it is accurate enough to use in testing a commercial device?" Mr. Oppermann expressed the need for the development of a test method (or procedures) that can be used to identify meters that perform well enough that they can be used as a standard in testing. Mr. Robert Murnane (Seraphin Test Measure, Co.) stated that he echoed Mr. Oppermann's comments. He acknowledged the existence of the national work group that NIST had created for the purpose of identifying the variables and parameters over which a proposed alternate standard must be tested and evaluated to ensure that the methodologies and standards facilitate measurements that have metrological traceability. He also noted jurisdictions could already use alternative standards if controls are in place to validate their traceability. Mr. Oppermann and Mr. Murnane both forwarded written comments to the Committee in advance of the meeting opposing the adoption of these two items and recommending their status be changed from Voting to Developing.

Mr. Michael Keilty (Endress + Hauser Flowtec AG USA) stated that he would entertain a change to the terminology (transfer standard) in his proposals. He reported that some jurisdictions will not allow the use of a transfer standard unless it is mentioned in HB 44. He said that he agreed with Mr. Murnane and Mrs. Butcher that procedures would still need to be in place to ensure the adequacy of that standard for use in testing a commercial device. He recommended the Committee present the two items for vote.

Based on the concerns raised by numerous members during the open hearings and recommendations from all four regional associations, the Committee felt the two items in the group had merit, but more work is necessary to move them forward and the Committee agreed to downgrade them to a Developing status.

During the 2018 NCWM Interim Meeting, the Committee heard from Mr. Michael Keilty (Endress & Hauser Flowtec AG USA), submitter of the item, that he originally proposed this item in 2014. The item went to a vote and was pulled back due to objections. He stated there has been widespread support for the use of these meters in the meter manufactures meetings. The proposed language was modified to "field reference standard meter test" in consideration of Mr. Oppermann's letter in regard to "transfer standards." An additional change was to amend the time, with respect to the minimum amount delivered, from 2 minutes to 1 minute. He mentioned that the OWM's analysis said that Mr. Val Miller (OWM) was assigned to look into this item but he had not heard from him. Mr. Keilty feels that the language in the proposal is appropriate and asked that this item be moved forward as a Voting item.

Mr. Henry Oppermann (Weights and Measures Consulting, LLC) speaking on his own behalf, as well as representing Seraphin Test Measure Co., commented during the Committee's review of Block 5 in its open hearings, to address this Item. He spoke to the letter he submitted and recommended the item remain Developing.

During its work session, the Committee considered the comments heard on this item. The Committee agreed to recommend that this item remain Developing. The Committee also agreed that items LPG-4, MFM-2, and all Block 5 items are related to the Block 4 items due to terminology. The Committee recommends that the submitter of the Block 4 items (OWM) provide detail of their developing language to the submitter of the related items (Endress & Hauser Flowtec AG USA) to prevent conflicting terms as they are considered during future meetings.

The Committee did not take comments during open hearings on Developing items at the 2018 NCWM Annual Meeting except to grant the submitter of a Developing item (or block of Developing items) an opportunity to provide an update on the progress made to further develop the item(s) since the 2018 NCWM Interim Meeting. At the 2018 NCWM Annual Meeting, the Committee received comments from the submitter of this item, Mr. Michael Keilty (Endress + Hauser Flowtec). Mr. Keilty reported he had proposed this item in 2014 to allow flow meters to be used as field reference standards. Mr. Keilty indicated he believes the item is ready to be presented for vote. He stated there was a question in terms of the time of delivery specified in the proposal (i.e., "in one minute"), but this is a minimum amount of time. More time could be used. The only thing that might be questionable is the terminology. NIST's terminology difference could be an editorial change.

OWM provided the following written recommendations and comments to this item and item MFM-2, which OWM considers similar, as feedback to the submitter and as part of its analysis of the S&T Committee's 2018 agenda items:

Since 2015, the S&T Committee has had items LPG-4 N.3. Test Drafts and MFM-2 Test Drafts (previously numbered 3302-1 and 3307-1 and 332-5 and 337-3) on its agenda related to the use of what are being referenced as "transfer standards" (also referred to as "master meters" by many). OWM recognizes many in the weights and measures community, regulators and service companies alike, would like to use "master meters" for testing products such as LPG and compressed natural gas (CNG). OWM believes using such test equipment, if appropriately verified, may offer advantages in terms of: (1) practicality for some types of measurements; (2) cost effectiveness; (3) saving time; and (4) increasing safety. However, simply adding a paragraph to the notes sections of these two codes does not ensure that the use of such devices as a standard for testing is appropriate. OWM offers three vital points for the community's consideration as it deliberates on modifying handbook codes to recognize the use of alternate test apparatus. Work to establish uniform specifications and terminology for test standards is still needed in, as a minimum, the following areas:

1. Requirements and guidelines for using "legal-for-trade" devices as field test standards, particularly when using commercially available, "legal-for-trade" devices.

2. Adding delivery time requirements when based on adequate data that supports the requirement.

3. Use of the term "field standard" to replace terms such as "transfer standard," "master meter," and other terms used to describe a standard used to test legal-for-trade devices. These standards would be used to evaluate

the performance of devices for type approval and use in field applications. This related issue remains a Developing item on the Committee's agenda.

OWM offers the following technical comments on each of these points.

1. **Requirements for "legal-for-trade" devices used as standards.**

   When standards are used to test legal-for-trade devices, it is crucial that there be data available to support the NIST HB 44 Appendix A, Fundamental Consideration for testing apparatus; this section states that when the standard is used without correction, its combined error and uncertainty must be less than one-third of the applicable device tolerance.

   In previous reviews of these items and comments to the S&T Committee as part of its regular "analysis of issues," OWM provided a list of the different "essential elements of traceability" that need to be in place before such testing equipment can be recognized as a "standard." These elements are listed below.

   A thorough evaluation of the standard must be conducted that includes:

   - collection of data from the use of the standard over wide environmental conditions (since this standard will be used in various locations throughout the U.S.);
   - demonstration of its reliability and repeatability over time; and
   - determination that its design is suitable so that tests can be conducted under conditions of actual use of the device.

In addition, prior to acceptance of field standards, there are necessary components that should be in place at multiple levels in the weights and measures infrastructure such as:

- Laboratory testing to verify the standard.
  - Adequate equipment and facilities for testing the standards in the laboratory.
  - Documented criteria for the standards.
    - For example, a NIST 105 or other document outlining requirements and other criteria.
  - Documented and accepted procedures for testing the standards.
  - Training for laboratory staff.
- Field Testing
  - Training for field staff (service person and regulatory officials).
  - Documented test procedures for use of the standards.
    - For example, an EPO or other documented procedure.
  - Documentary standards to support the use of the standards
    - For example, changes needed (if any) to address the use of the standards to test a particular type of measuring system.
- Other Issues
  - Assessment of the appropriateness of the standard for use in testing commercial measuring (or weighing) systems.
  - Plans for implementation of standards and test procedures and associated training to ensure common understanding and application.

A system is needed for acceptance of field standards that results in the following:

- Manufacturers knowing and applying the requirements for the design of the standard;
- Systematic and appropriate collection of measurement data on proposed new standards;
- States (regulatory authority) having access to the measurement data to determine whether or not a standard meets the requirements; and
- Proper training and procedures for field use of the standards.

OWM developed general guidelines for use in collecting data that weights and measures officials interested in verification of standards used in field evaluation, may use to collect data. OWM is also working with the Alternative Test Methods Work Group in efforts to analyze and review data collected that can be shared with States.

In addition, OWM recognizes the need to assess the appropriateness of the use of "master meters" as field standards and the need to control the variables associated with using a meter as a field standard. To help the community begin addressing this current gap, OWM is doing work to analyze the issues involved in establishing traceability of such systems to assist jurisdictions in investigating the possibility of using such systems. As part of this work, OWM is purchasing six Coriolis meters as follows to test refined fuels, LPG, and CNG:

- two $^{1}/_{2}$-inch meters;
- one 1-inch meter;
- two 1 $^{1}/_{2}$-inch meters;
- one 3-inch meter, and
- one $^{1}/_{2}$-inch meter, specific for testing CNG

OWM will work with states and industry to collect field data to determine if these standards will meet the Fundamental Considerations Section 3.2 in NIST HB 44.

2. **Adding "delivery time" requirements when the specified "delivery time" is based on adequate data that supports the requirement.**

   In its previous analyses, OWM pointed out data needs to be provided to ensure an appropriate time is specified in the requirements for N.3.2. Field Reference Standard Meter Test for delivery of a sufficient test draft. Including a specified time helps ensure a fair test of the device's performance and must take into account the design/technology of test equipment used to test a commercial device. OWM has questioned the basis for the minimum delivery times proposed in the current and earlier versions of the Items LPG-4 and MFM-2 and continues to note no justification has been provided for either the specific time limit suggested or the need for this additional paragraph.

   In the most recent version of the proposed N.3.2., the time limit is proposed as one minute "*at the flow rate being tested*" as opposed to one minute at the "*normal discharge rate*" of the device being tested. OWM questions the rationale behind establishing the time frame based on different criteria.

   The recommended minimum test procedures specified in NIST EPOs for metering systems requires the following two tests:

   (1) a "normal" test (sometimes referred to as a "fast" test) conducted at the normal discharge rate of the meter in the installation. and

   (2) a "special" test (sometimes referred to as a "slow" test) conducted at a flow rate slightly above the marked minimum discharge rate.

These two tests allow the inspector to assess: (1) the condition of the meter; (2) the maintenance of the metering system; and (3) the use of adjustments. In making this analysis, it is essential that the only variable that change is the flow rate.

For example, the minimum tests for an LPG metering system equipped with an automatic temperature compensating (ATC) system includes:

(1) Normal (fast flow) with ATC activated

(2) Normal (fast flow) with ATC de-activated

(3) Special (slow flow) with ATC de-activated

The test draft size and other conditions such as temperature and pressure must be as similar as possible for the three tests.

For tests (1) and (2), the flow rate, draft size, and other conditions such as temperature and presser are the same; the only variable that is the activation/de-activation of the ATC system. Examining the results of the first two tests together allows for an assessment of how the ATC is functioning and whether adjustments to the ATC may have been used to (inappropriately) make adjustments to compensate for meter wear.

For tests (2) and (3), the activation/de-activation of the ATC system, draft size, and other conditions such as temperature and pressure are the same; the only variable is the flow rate. Examining the results of the second and third tests together allows for an assessment of the meter's condition and whether or not adjustments may have been used inappropriately to mask extreme wear in the meter as opposed to bringing the meter as close to zero error as possible.

Thus, if a test conducted at a slower flow rate is of a *different draft size*, as outlined in the proposal, the results of that test cannot be used to make the latter assessment. OWM is concerned that the proposed change to N.3.2. might be misinterpreted by inspectors and service personnel and result in unnecessary additional testing.

3. Using the term "field standards" to replace terms such as "transfer standards," "master meter," and other terms used to describe a standard used to test legal-for-trade devices.

OWM notes items N.3.2. LPG-4 and MFM–2 use the terminology "Field Reference Standard Meter Test." There are other proposals on the Committee's agenda currently addressing the need to review and revise terminology used for standards and test equipment used in the testing of commercial weighing and measuring systems.

In Block 4 of the Committee's report, OWM submitted proposed changes to the following sections of NIST Handbook under the general heading of "Terminology for Testing Standards."

- Scales Code
- Automatic Bulk Weighing Systems Code
- Automatic Weighing Systems Code
- Cryogenic Liquid-Measuring Devices Code
- Carbon Dioxide Liquid-Measuring Devices Code
- Hydrogen Gas-Measuring Devices Code
- Grain Moisture Meters Code,
- Electronic Livestock, Meat, and Poultry Evaluation Systems and/or Devices Code
- Appendix A
- Appendix D

The changes proposed in the Block 4 items are intended to standardize Handbook 44 terminology for standards used in testing commercial weighing and measuring systems. In those items OWM proposes the use of the term "field standard" to describe these standards.

Endress+Hauser Flowtec submitted similar proposals under Block 5 Define "Field Reference Standards" to add a definition for field reference standard and delete the use of transfer standards in the following Handbook 44 codes.

- Cryogenic Liquid-Measuring Devices Code
- Carbon Dioxide Liquid-Measuring Devices Code
- Hydrogen Gas-Measuring Devices Code

To allow for the opportunity to incorporate comments received on its Block 4 Items, OWM continues to recommend those items be designated as Developing items. OWM expects to make progress on addressing those comments between now and the fall 2018 regional weights and measures association meetings. OWM believes the proposals in Block 5 should also remain Developing to help ensure alignment across Handbook 44 and a common understanding of what constitutes a "field standard."

As work progresses on Block 4 and 5 items, we acknowledge there may be a need to define other commonly used terms such as "master meter" in the context of "field standards" to help ensure a consistent understanding of: (1) the terms; and (2) the elements that need to be addressed to establish the traceability of any standard within the requirements laid out in the Fundamental Considerations.

Items LPG-4 and MFM-2 is directly impacted by the discussion on terminology in Blocks 4 and 5, but most importantly they will be impacted by the definitions of what is needed to establish an artifact or system as a "field standard."

In consideration of the comments from the submitter, and the analysis from OWM, the Committee agreed that the terminology in this item should align with the terminology that will be used in the NIST OWM's Block 4 items (B4) that are still being developed. The Committee agreed that the item should remain a Developing item and recommends that the OWM provide detail on their Developing items in Block 4 to the submitter so that they can better align.

Regional Association Comments:
During the WWMA's fall 2017 Annual Meeting, the WWMA agreed to recommend that this item be a Developing item and further recommended it be harmonized with items New 6-15 (which are the Block 4 items in this report) and New 24-27 (which are the Block 5 items in this report) as the different terms used in these new items will affect their application. The WWMA's S&T Committee reported it believes terms, such as "Transfer Standard," "Testing Standards," "Verification (Testing) Standards," "Field Standards," "Field Reference Standard Meter," "Master Meter," etc., in New 6-15 (Block 4 Items), and New 24-27 (Block 5 Items) need to be defined and possibly standardized prior to further development of this item. The Committee is also concerned that Handbook 44 is not the appropriate place to specify the type of test equipment necessary for conducting tests.

At the SWMA's fall 2017 Annual Meeting, Mrs. Tina Butcher (NIST OWM) provided comments on this item and item 3307-2 noting that Mr. Val Miller (NIST OWM) will be looking at master meters and considering the development of a NIST Handbook 105-X, which might address master meters. She noted that the issue of "master meters" is very broad and that it is necessary to consider the specific type (technology) of master meter used and the application where it will be used. During its work session, the SWMA S&T Committee noted the Measuring Sector also considered these items and is beginning work to address the use of one specific type of master meter as a starting point for developing further criteria for use in type evaluation. The SWMA S&T Committee also acknowledged that Mr. Bob Murnane (Seraphin Test Measure) provided written comments on this issue (see also the SWMA S&T Committee's comments under Item New-6). The SWMA supports the concept of using "master meters" (and acknowledged that other terms have been and are being proposed) for various metering applications. The SWMA believes there is still confusion over the terminology and that it is difficult to review multiple items related to the same basic issue. The SWMA recommended this item remain Developing.

The CWMA recommended this item move forward as a Developing item at both its fall 2017 Interim and spring 2018 Annual Meetings. The CWMA reported it agrees more development is necessary to keep up with changing technology in the marketplace.

NEWMA recommended this item move forward as a Developing item at both its fall 2017 Interim and spring 2018 Annual Meetings. At its 2017 Interim Meeting NEWMA reported that the item had been recently modified by the submitter and is currently being developed. The item has merit. At its 2018 Annual Meeting, NEWMA reported receiving a comment that the item was redundant and that the code already covered this. There were several comments received recommending more data and further development of this item.

Additional letters, presentations, and data may have been submitted for consideration with this item. Please refer to **www.ncwm.com/interim-archive** to review these documents.

LPG-5 D N.4.1.2. Repeatability Tests and N.4.2.4. Repeatability Tests for Type Evaluation

Source:
Ross Andersen, NY retired (2017)

Purpose:
Address differences between Handbook44 and Publication 14 practices for LPG liquid meter testing.

Item under Consideration:
Amend NIST Handbook 44 LPG and Anhydrous Ammonia Liquid-Measuring Devices Code as follows:

> **N.4.1.2. Repeatability Tests. –** Tests for repeatability should include a minimum of three consecutive test drafts of approximately the same size and be conducted under controlled conditions where variations in factors such as temperature, pressure, and flow rate are reduced to the extent that they will not affect the results obtained. **Repeatability tests shall be based on the uncompensated volume, e.g. with the temperature compensator deactivated. Both field tests and type evaluation tests shall be run at flow rates consistent with normal tests as specified in N.4.1.**
>
> **(Amended 20XX)**

Add a new Paragraph N.4.2.4. as follows:

> **N.4.2.4. Repeatability Tests for Type Evaluation. – Tests for repeatability should include a minimum of three consecutive test drafts of approximately the same size and be conducted under controlled conditions where variations in factors such as temperature, pressure, and flow rate are reduced to the extent that they will not affect the results obtained. Repeatability tests shall be based on the uncompensated volume, e.g. with the temperature compensator deactivated. Type evaluation tests shall be run at flow rates consistent with special tests as specified in N.4.2., N.4.2.1., N.4.2.2., or N.4.2.3. as appropriate.**
>
> **(Added 20XX)**

Background/Discussion:

Note: This agenda item appeared on the Committee's 2017 agenda as Agenda Item 3302-2.

The proposal is aimed to correct a number of areas of confusion. The inclusion of repeatability in the N.4.1. series indicates that repeatability is to be run at normal flow rates. The submitter believes that there is some confusion as to whether this was the actual intent and notes that running the tests only at Normal flow rates is consistently how the test was performed in the field. The proposed amendment to paragraph N.4.1.2. Repeatability Tests clarifies this explicitly for field tests and type evaluation tests.

The new paragraph regarding type evaluation is proposed because NTEP has, for a long time, required repeatability on tests over the entire range of flow rates conducted under controlled conditions during type evaluation testing. This means that these tests are conducted anywhere between rated maximum and minimum flow rates. The proposed addition would formalize and legitimize what has been done for a long time.

Another question that has arisen is whether gross or net results could be used in repeatability tests. Obviously, one cannot compare net to gross but can compare three consecutive gross or three consecutive net results. As the practice in NIST HB 44 is to test one variable at a time to the extent possible, the proposed revision would clarify that repeatability is assessed on gross meter performance only. This can be accomplished by deactivating the ATC and conducting the repeatability tests or just using gross values where both gross and net are available from the same test draft.

At the Committee's 2017 NCWM Interim Meeting open hearings, the Committee heard support for the item from Mr. Dmitri Karimov (Liquid Controls) on behalf of the MMA.

Mrs. Tina Butcher (NIST OWM) clarified that, although it is common for repeatability to be conducted at the normal flow rate, there is nothing precluding an inspector from running these tests at any valid flow rate. The meter should be expected to be repeatable at any flow rate throughout the approved range. OWM concurs with the submitter that the specific tolerances for "repeatability" found in the specific codes are located under the heading of "normal tests." There was also some discussion as to whether or not repeatability should only be applicable to gross or uncompensated meter readings. Some felt that the same requirements should also be applicable when testing a meter in net or compensated mode. OWM suggested that this may have unintended consequences. These may include errors or stability issues in the temperature compensation being interpreted as apparent repeatability issues.

Mr. Constantine Cotsoradis (Flint Hills Resources) also questioned whether or not repeatability requirements may be applied to the compensated, net registrations.

Mr. Michael Keilty (Endress & Hauser Flowtec AG) commented that the proposal should be further evaluated by the NTEP laboratories.

Mr. Karimov reminded the group that any changes to the requirements must consider all meter technologies and not just positive displacement (PD) meters.

Ultimately, the Committee agreed that more work was needed to develop the item and assigned it a Developing status. During its open hearings at the 2017 NCWM Annual Meeting, the Committee received comments from the submitter of this item, Mr. Ross Andersen (New York, retired), supporting further development of this item. Mr. Andersen noted he had submitted this item because he wanted to make clear in NIST HB 44 that for field evaluation, repeatability tests are only to be conducted at normal flow rates (i.e., at flow rates consistent with paragraph N.4.1. Normal Tests). NIST HB 44 also needs to clarify whether repeatability tests are to be conducted using temperature compensation or without temperature compensation. He further noted that NTEP evaluates these meters across all flow rates and that he would work with the MMA and the Measuring Sector to further develop this item.

In written comments submitted to the Committee, NIST OWM concurred with the need to make modifications to the measuring codes to clarify the application of repeatability criteria. OWM believes it is not clear whether the original intent was to limit the application of the repeatability tolerances in the specific codes to only certain types of tests. During discussion at the MMA meeting, it was noted that the 2001 Measuring Sector discussion included no reference to limiting repeatability tests to only normal tests, which raises the question of whether or not the location in the code is appropriate. Prior to the addition of repeatability tolerances in the measuring codes, only G-S.5.4. Repeatability of Indications applied which allows variation across the full range of the tolerance. When considering the addition of the repeatability requirements to the specific measuring codes, the W&M community felt strongly that a measuring device should be able to repeat its indications within a much smaller limit. Field officials should be able to verify a device is capable of repeating its indications at other flow rates and use conditions. Repeatability testing at other than normal flow rates should not be limited to type evaluation.

During the Committee's work session, the NIST Technical Advisor further noted that initially, OWM had questioned whether the 40 percent of the absolute value of maintenance tolerance was too tight to apply to the results of "Special Tests." However, during the MMA meeting at the 2017 Annual Meeting, it was noted that "Special Tests" are granted a larger tolerance. Thus, applying the "40 percent" value to the maintenance tolerances applied to special tests would result in applying a larger repeatability tolerance to those tests. Additionally, there was no mention of restricting the tolerances to only normal tests in either the S&T Committee or Measuring Sector reports when the tolerances were initially added. Consequently, testing at multiple flow rates seems appropriate and the code needs to be changed to clarify the intent.

Based on the comments heard and its work session discussions, the Committee agreed to recommend this item be further developed.

During the 2018 NCWM Interim Meeting, the Committee received comments on this item from Mr. Ross Andersen (NY, retired) who reiterated the proposal he put forth addresses the difference between NIST HB 44 and NCWM Publication14. Both an uncompensated test and a compensated test are to be performed as "field tests" for type evaluation. It was not clear if repeatability tolerances should be applied to slow-flow tests.

During the Committee's work session, Committee members agreed this item should remain in a Developing status.

The Committee did not take comments during open hearings on Developing items at the 2018 NCWM Annual Meeting except to grant the submitter of a Developing item (or block of Developing items) an opportunity to provide an update on the progress made to further develop the item(s) since the 2018 NCWM Interim Meeting. Mr. Ross Andersen (New York, retired) submitter of this item, gave a brief update. He stated repeatability testing shall be based upon the uncompensated volume register only. The intent is to remove as many variables as possible during repeatability testing in order to ensure that only the meter performance is being evaluated. If testing is conducted on the compensated volume, then any changes in the compensated parameters (temperature or pressure) will have an effect on the repeatability results, which does not give a true indication of the meter's performance.

Mr. Andersen also advised that NTEP repeatability testing is conducted across the entire range of a meter's flow rates. There are 5 tests conducted at 20% increments throughout the flow range of the meter. This testing is not supported by NIST HB 44. Mr. Andersen further pointed out that, given a meter's performance curve at low flow rates, even the smallest change in flow rate can cause a significant shift in error.

Mr. Dmitri Karimov (Liquid Controls) representing the MMA, also noted that controlling flow rate on some meters, notably RMFDs, can be very difficult as the nozzle valve has limited adjustability and the flow rate is not usually indicated on the register.

Mr. Andersen also reported he plans to continue working with OWM to further develop this item and possibly have it ready for voting during the 2019 NCWM cycle.

OWM provided the following written recommendations and comments to this item as feedback to the submitter and as part of its analysis of the S&T Committee's 2018 agenda items:

OWM concurs with the need to make modifications to the measuring codes to clarify the application of repeatability criteria. OWM reiterates its comments provided to the Committee at the 2018 Interim Meeting and previously and has updated some of its technical rationale.

OWM suggests the Committee consider the following alternative proposal:

Move N.4.1.2. Repeatability Tests to follow paragraph N.4.2. Special Tests by renumbering N.4.1.2. to N.4.3. and renumbering current N.4.3. and subsequent paragraphs. Delete the new proposed N.4.2.4. Repeatability Tests for Type Evaluation.

~~N.4.1.2.~~ **N.4.3.** **Repeatability Tests. –** Tests for repeatability should include a minimum of three consecutive test drafts of approximately the same size and be conducted under controlled conditions where variations in factors such as temperature, pressure, and flow rate are reduced to the extent that they will not affect the results obtained. **Repeatability tests shall be based on the uncompensated volume~~, e.g.~~; that is, with the temperature compensator deactivated.** ~~**Both field tests and type evaluation tests shall be run at flow rates consistent with normal tests as specified in N.4.1.**~~

~~**(amended 20XX)**~~

~~Add a new Paragraph N.4.2.4. as follows:~~

~~**N.4.2.4. Repeatability Tests for Type Evaluation. – Tests for repeatability should include a minimum of three consecutive test drafts of approximately the same size and be conducted under controlled conditions where variations in factors such as temperature, pressure, and flow rate are reduced to the extent that they will not affect the results obtained. Repeatability tests shall be based on the uncompensated volume, e.g. with the temperature compensator deactivated. Type evaluation tests shall be run at flow rates consistent with special tests as specified in N.4.2., N.4.2.1., N.4.2.2., or N.4.2.3. as appropriate.**~~

~~**(Added 20XX)**~~

OWM's rationale for these proposed changes is outlined below.

Prior to the addition of repeatability tolerances in the measuring codes, only G-S.5.4. Repeatability of Indications applied. When considering the addition of the repeatability requirements to the specific measuring codes, the W&M community felt strongly that a measuring device should be able to repeat its indications within a much smaller limit. Repeatability testing at other than normal flow rates should not be limited to type evaluation. Field officials should have the option of verifying a device is capable of repeating its indications at other flow rates and use conditions.

In reviewing the history of this paragraph, it is not clear whether the decision to include the "Note" under the paragraph addressing "Normal Tests" was intended to limit the application of the repeatability tolerances in the specific codes to only certain types of tests. We found no mention of restricting the tolerances to only normal tests in either the S&T Committee or 2001 Measuring Sector reports when the tolerances were initially added. This raises the question of causes whether the location in the code is appropriate. Conducting repeatability testing at any flow rate at which the device is rated for use seems appropriate and suggests the code needs to be changed to clarify the intent.

During the Committee's work session at the 2017 NCWM Annual Meeting, the NIST Technical Advisor further noted that, initially, OWM had questioned whether the 40 percent of the absolute value of maintenance tolerance was too stringent to apply to the results of "Special Tests." However, during an MMA meeting held in conjunction with that same NCWM meeting, it was noted that "Special Tests" are granted a larger tolerance. Thus, applying the "40 percent" value to the maintenance tolerances applied to special tests would result in applying a larger repeatability tolerance to those tests than would be applied for a "Normal Test." Based on the comments heard and its work session discussions, the Committee agreed to recommend this item be further developed.

OWM offers the following points (most of which have been shared on multiple occasions) for the Committee and submitter to consider in developing any revisions to the proposal:

- OWM supports the principle of the proposed changes, but feels additional changes are needed before moving forward with the proposal.

- OWM concurs that the placement of the repeatability test under N.4.1. Normal Tests indicates the test is to be run at a normal flow rate; however, it is not clear that this limitation was originally intended.

- OWM believes the paragraph should be moved from under the "Normal Test" heading to a separate paragraph to avoid any future confusion and suggests renumbering the paragraph accordingly.

- Systems must be able to provide repeatable measurements under all conditions of use, not just at the normal flow rate. Since the repeatability tolerance is based on the applicable “normal” or “special” test maintenance tolerances, the tolerance structure allows for a larger maintenance tolerance (and, therefore, a larger repeatability tolerance) for special tests for most VTMs. As an additional consideration, tests run at reduced flow rates often reveal problems with meter repeatability that may not be observed at normal flow rates.

- Field officials should not be precluded from conducting a repeatability test at all flow rates within the rated flow range of the meter, provided appropriate tolerances are applied.

There appears to still be some confusion over references to conducting repeatability testing for devices equipped with automatic temperature compensating systems. OWM concurs with technical points raised in discussions during S&T Committee work sessions, Measuring Sector, and Meter Manufacturers Association meetings questioning whether it is appropriate for repeatability tests to be conducted when automatic temperature compensating components are activated. OWM agrees that repeatability tests should not be conducted when mechanical ATC systems are activated. For systems equipped with electronic ATC, the calculation of the net value is determined based on a mathematical calculation, so the exemption should be unnecessary for those systems. However, it seems unnecessary to examine the net values for repeatability in such cases since they are simply a calculated value.

The Committee agreed to carryover this item on its agenda as a Developing item and looks forward to seeing it in its final form for voting in the future.

Regional Association Comments:
At its fall 2017 Annual Meeting, the WWMA agreed to recommend this item be a Developing item as work is continuing by the OWM, MMA, and submitter.

At the fall 2017 SWMA Annual Meeting, the Committee received no comments on this item. During its work session, the Committee noted that the Measuring Sector discussed this item and may have recommendations to make to the submitter. The SWMA acknowledged additional work is needed on the item and recommended the item remain Developing.

At the CWMA’s fall 2017 Interim Meeting, the Committee reported that it believes this item pertains specifically to mechanical compensators and is not necessary for today’s technology. The CWMA recommended the item be Withdrawn. At the CWMA’s spring 2018 Annual Meeting, no comments were received on the item and the CWMA recommended the item as a Developing item on the NCWM agenda.

During NEWMA’s fall 2017 Interim Meeting, a comment was heard that the test currently being conducted by NTEP did not have any legal basis. The language in this item merely allows NTEP to conduct the same test legally. NEWMA reported it believes this item is fully developed and ready to be voted upon. At NEWMA’s spring 2018 Annual Meeting, the Committee received no comments on this item and the CWMA recommended the item as a Developing item on the NCWM agenda.

Additional letters, presentations, and data may have been submitted for consideration with this item. Please refer to **www.ncwm.com/interim-archive** to review these documents.

WTR – WATER METERS

WTR-2 V S.2.1. Provision for Sealing and Table S.2.1. Categories of Device and Methods of Sealing

(This item was Adopted.)

Source:
California (2018)

Purpose:
Standardize sealing requirements in the Water Meter Code with the LMD Code.

Item under Consideration:
Amend NIST Handbook 44 Water Meters Code as follows:

S.2.1. Provision for Sealing – Adequate provision shall be made for **an approved means of security (e.g., data change audit trail) or** for **physically** applying a security seal~~s~~ in such a manner that **requires the security seal to be broken before an** ~~no~~ adjustment or interchange can be made of:

(a) any measuring **or indicating** element; ~~**and**~~

(b) any adjustable element for controlling delivery rate when such rate tends to affect the accuracy of deliveries; **and**

(c) any metrological parameter that will affect the metrological integrity of the device or system.

When applicable, the adjusting mechanism shall be readily accessible for purposes of affixing a security seal.

(Amended 2018)

[Audit trails shall use the format set forth in Table S.2.1.]*
[*Nonretroactive as of January 1, 2019]

Table S.2.1. ***Categories of Device and Methods of Sealing***	
Categories of Device	***Methods of Sealing***
Category 1: No remote configuration capability.	***Seal by physical seal or two event counters: one for calibration parameters and one for configuration parameters.***
Category 2: Remote configuration capability, but access is controlled by physical hardware. ***The device shall clearly indicate that it is in the remote configuration mode and record such message if capable of printing in this mode or shall not operate while in this mode.***	***The hardware enabling access for remote communication must be on-site. The hardware must be sealed using a physical seal or an event counter for calibration parameters and an event counter for configuration parameters. The event counters may be located either at the individual measuring device or at the system controller; however, an adequate number of counters must be provided to monitor the calibration and configuration parameters of the individual devices at a location. If the counters are located in the system controller rather than at the individual device, means must be provided to generate a hard copy of the information through an on-site device.***
Category 3: Remote configuration capability access may be unlimited or controlled through a software switch (e.g., password). ***The device shall clearly indicate that it is in the remote configuration mode and record such message if capable of printing in this mode or shall not operate while in this mode.***	***An event logger is required in the device; it must include an event counter (000 to 999), the parameter ID, the date and time of the change, and the new value of the parameter. A printed copy of the information must be available on demand through the device or through another on-site device. The information may also be available electronically. The event logger shall have a capacity to retain records equal to 10 times the number of sealable parameters in the device, but not more than 1000 records are required. (Note: Does not require 1000 changes to be stored for each parameter.)***

[Nonretroactive as of January 1, 2019]
(Added 2018)

Background/Discussion:
Water meters submitted to NTEP now have digital registers instead of the old analog odometer-type registers. The current HB 44 Water Meters Code, Section 3.36, paragraph S.2.1. Provision for Sealing seems to only allow for a physical sealing provision. Digital registers use a remote device or even Near Field Communication (NFC). Because of the digital technology changes, the NCWM should adopt the three categories for sealing into the Water Meters Code to allow for sealing via an audit trail event counter (Category 2 devices) or event logger (Category 3 devices) because a physical seal won't protect or even be tamper-evident. Meters using remote means or NFC have the capability to change the unit of measure from gallons to cubic feet or even the calibration factor. We need the criteria of a Category 2 or 3 sealing provision to properly seal meters that are digital. Otherwise, water meters using today's technology cannot be certified by NTEP.

At the 2018 NCWM Interim Meeting open hearings the Committee heard comments from Ms. Kristin Macey (CA). Ms. Macey stated that she recommends the item go forward as a Voting item.

The Committee, hearing no other comments, agreed to amend the proposal as recommended by Ms. Macey and as shown in Item under Consideration. The Committee also agreed to assign this item Voting status.

At the 2018 NCWM Annual Meeting, the Committee received comments predominantly in support of the item with some changes recommended to the nonretroactive dates appearing within Table S.2.1. to eliminate a conflict with the nonretroactive date proposed in paragraph S.2.1. of the item.

Mrs. Tina Butcher (NIST OWM) commented the OWM agrees with the proposed changes as they will harmonize the Water Meters Code with other HB 44 codes that have included these requirements for some time; however, there are dates proposed within the table that should be changed. OWM suggested the Committee amend Table S.2.1. by removing all nonretroactive dates appearing in different rows and columns within the table and assign a single nonretroactive date of "2019" to the entire table. Mrs. Butcher further commented that OWM had discussed these changes with the submitter of the item (CA) who had agreed the changes sre needed, but the submitter was not able to attend the Annual Meeting. In its written analysis of this item to the Committee, OWM provided a revised draft of the proposal, which included the changes OWM had suggested during open hearings.

Mr. Michael Keilty (Endress + Hauser Flowtec AG USA) commented that, as a member of the American Water Works Association, he was concerned that not all stakeholders, including some US water meter manufacturers, are aware of the proposal and could be impacted by the changes. He recommended, for this reason, that the item be a Developing item. Mrs. Butcher, as a follow up to Mr. Keilty's comments, noted that during type evaluation, some of the water meter manufacturers were involved and wanted to see the proposal move forward.

Mr. Kurt Floren (Los Angeles County, California, speaking on behalf of the State of California), reported California agrees with the proposed date changes recommended by the OWM.

In consideration of the comments heard in support of the item with the proposed date changes, and hearing that there was involvement from several stakeholders, the Committee agreed to amend the proposal as shown in Item under Consideration and present the item for vote.

(To view the proposal under consideration prior to the changes made by the Committee at the 2018 NCWM Annual Meeting, see the Committee's 2018 Interim Report – NCWM Publication 16).

Regional Association Comments:
The WWMA agreed at its fall 2017 Annual Meeting to recommend this item go forward as a Voting item with the following change:

- Add a non-retroactive date that specifies the date in which an audit trail if provided must use the format set forth in Table S.2.1.

The SWMA's S&T Committee received no comments on this item during the CWMA's fall 2017 Annual Meeting. The SWMA S&T Committee acknowledged that, while there are some dates specified in the proposed table, there is no date specified under paragraph S.2.1. for the effective date of the table as a whole. The SWMA recommended this be a Voting item with an additional recommendation that the NCWM S&T Committee specify an effective date prior to the vote.

There were no comments on this item during the CWMA's fall 2017 Interim Meeting and spring 2018 Annual Meeting. The CWMA recommended the item as a Voting Item on the NCWM agenda.

There were not comment on this item during NEWMA's fall 2017 Interim Meeting or spring 2018 Annual Meeting. NEWMA reported this item has merit and is fully developed, and recommended it move forward as a Voting item.

Additional letters, presentations, and data may have been submitted for consideration with this item. Please refer to **www.ncwm.com/interim-archive** to review these documents.

MFM – MASS FLOW METERS

MFM-2 D N.3. Test Drafts.

Source:
Endress + Hauser Flowtec AG USA (2015)

Purpose:
Allow transfer standard meters to be used to test and place into service dispensers and delivery system flow meters.

Item under Consideration:
Amend NIST Handbook 44 Mass Flow Meters Code as follows:

N.3. Test Drafts. –

<u>N.3.1 Minimum Test -</u> The minimum test shall be one test draft at the maximum flow rate of the installation and one test draft at the minimum flow rate. More tests may be performed at these or other flow rates. (See T.3. Repeatability.)

(Amended 1982 **<u>and 20XX)</u>**)

<u>N.3.2. Field Reference Standard Meter Test. – The minimum quantity for any test draft shall be equal to or greater than the amount delivered in one minute at the flow rate being tested.</u>

<u>(Added 20XX)</u>

Background/Discussion:

Note: This item previously appeared on the Committee's agenda as 337-3 in 2015 and 2016 and 3307-2 in 2017.

This item has also been modified by the submitter on two different occasions: October 2016 and September 8, 2017. Details of those changes are noted herein.

The use of transfer standards is recognized in Code sections 3.34 Cryogenic Liquid-Measuring Devices Code; 3.38 Carbon Dioxide Liquid-Measuring Devices Code; and 3.39 Hydrogen Gas-Measuring Devices – Tentative Code. The definition of the term "transfer standard" in HB 44 Appendix D only references cryogenic liquid-measuring devices. It has been pointed out that the term "transfer standard" is incorrect and that "field reference standard meters" may be more appropriate. For this reason, the submitter proposed, in his September 8, 2017 update to the proposal, that the title of new proposed paragraph N.3.2. be changed from "Transfer Standard Test" (the term used in earlier versions of the proposal) to "Field Reference Standard Meter Test" as is currently specified in Item under Consideration for this item.

Field evaluation of LPG meters, CNG dispensers, and LNG dispensers is very difficult using volumetric and gravimetric field standards and test methods. The tolerances for these applications are such that using field reference standard meters are more efficient and safer. With CNG and LNG and LPG applications, the field reference standard meters are placed in-line with the delivery system as it is used to fill tanks and vehicles. The use of field reference standard meters eliminates return-to-storage issues. The use of field reference standard meters is easier and faster compared to the use of traditional field standards. The cost of using field reference standard meters and transporting them is much less than the cost of traditional field provers and standards.

Recognition in Handbook 44 will enable states to allow field reference standard meters to place systems into service and for field enforcement.

Volumetric field provers and gravimetric field proving are susceptible to environmental influences. The State of Colorado uses a field reference standard meter to test propane delivery truck meters. The State of Nebraska has used a field reference standard meter to test agricultural chemical meters. Other States have asked that there be recognition in HB 44 in order for their State to allow the use of field reference standard meters.

In some applications, field reference standard meters are not more accurate than the meters used in the application. For that reason, longer test drafts and possibly more tests may need to be run.

The State of California is purported to have conducted a short study of field reference standard meters in the past. The conclusion did not lead to wide adoption of the practice.

Section 3.37 Mass Flow Meters user requirement U.R.3.8. Return of Product to Storage, Retail Compressed Natural Gas Dispensers requires that the natural gas, which is delivered into the test container during testing, must be returned to storage **or disposed of in a safe and timely manner (*text added by NIST Technical Advisor that is part of paragraph U.R.3.8.*). Returning CNG to storage is difficult; most often the test container can only be emptied by releasing its contents into the atmosphere. Additionally, states often have difficulties in remote locations finding suitable field reference equipment.

The submitter recommends that NIST update EPO 28 for CNG dispensers and EPO 26 for LPG Liquid Measuring Systems to include transfer standard meter tests. NIST Publication R 105-4 should also be revised to specifically address the transfer standard meter and the requirements for use.

The S&T Committee might also consider amending Sections 3.30 Liquid-Measuring Devices Code and 3.31 Vehicle-Tank Meters Code to allow transfer standard meters.

At the 2015 and 2016 NCWM Interim and Annual Meetings, the following "original version" of the proposal was considered:

Amend NIST Handbook 44 Mass Flow Meters Code as follows:

N.3. Test Drafts. –

<u>N.3.1 Minimum Test -</u> <u>Test drafts should be equal to at least the amount delivered by the device in one minute at its normal discharge rate.</u>

<u>N.3.2. Transfer Standard Test. –</u> <u>When comparing a meter with a calibrated transfer standard, the test draft shall be equal to at least the amount delivered by the device in 2 minutes at its maximum discharge rate.</u>

Editorial note: Paragraph N.3.1. Minimum Test has been editorial changed (i.e., text boldened and underlined, and an amended date of "1982" deleted) in this report to reflect the proposed paragraph is new for the Mass Flow Meters Code.

At the 2015 NCWM Interim and Annual Meetings, the Committee heard comments both in support of and in opposition to the proposal outlined in this item and a corresponding item in the LPG and Anhydrous Ammonia Liquid-Measuring Devices Code. Mr. Mike Keilty (Endress + Hauser Flowtec AG USA), submitter of these two items outlined the benefits of using a master meter as a standard in testing application such as CNG, LNG, and LPG. The Committee heard comments in opposition to the proposal from Mr. Henry Oppermann (Weights and Measures Consulting, LLC and speaking on behalf of Seraphin Test Measure, Co) who noted there are significant differences between a transfer standard and a field standard. Mrs. Tina Butcher (NIST OWM) acknowledged the advantages to identifying and developing alternate test methods such as this but noted that simply adding the proposed language to HB 44 doesn't address the multiple other elements that need to be in place to ensure traceability; OWM provided a list of those elements along with other suggestions. OWM noted that the USNWG on Alternative Test Methods might be a better venue to develop the elements to support the use of these devices. This was echoed by Mr. Dmitri Karimov (Liquid Control, LLC) who also commented that the regulatory authority must assess the suitability of a given standard. The Committee also heard from Ms. Kristin Macey (CA) who commented that if the proposal were adopted, it would allow use of a transfer standard and California would not be able to fully support it, citing results of comparison testing conducted by CA in which the master meter performed worst of the three methods examined. Mr.

Keilty, in response to Mrs. Butcher's and Mr. Oppermann's comments, stated that he agreed completely and noted that adding the paragraph to these two codes is a step towards allowing the use of transfer standards and it's understood that there are many things that would need to be in place in order that they be considered suitable for use in testing. The Committee also heard other comments from regulators and industry supporting the continued development of this issue. The Committee agreed that the item has merit but needs further development and suggested the submitter work with OWM by providing data for the USNWG to consider.

See the Committee's 2015 Final Report for additional details.

At the 2016 NCWM Interim and Annual Meetings, the Committee again heard comments both in support of and in opposition to this item and the corresponding item in the LPG and Anhydrous Ammonia Liquid-Measuring Devices Code. Mr. Michael Keilty (Endress + Hauser Flowtec), the submitter, stated he supported this item as a Voting item as did Alan Walker (FL). Others expressed support of the item but noted the need for additional development. The Committee heard again from Mrs. Tina Butcher and Mr. Henry Oppermann, who reiterated their 2015 detailed comments regarding the tasks that need to be completed before considering changes to Handbook 44. Both echoed the need to collect data in order to properly evaluate whether or not a master meter could be considered a suitable standard.

During its Interim Meeting work session, the Committee acknowledged comments suggesting the need for additional test data. It was also acknowledged that there was a lot of support for the proposal. Those supporting the proposal had indicated that using a transfer standard is much easier and faster than testing gravimetrically and eliminates the need to discharge product from a prover into the atmosphere, which is viewed by many as a safety concern. Given that the addition of the proposed language would not dictate the method of testing and the decision on whether or not to use a particular method of testing would remain with each jurisdiction, the Committee agreed to present both items for vote at the Annual Meeting.

At the 2016 Annual Meeting, the Committee received numerous comments from industry and regulators alike, predominantly in support of the proposals. These comments cited benefits such as safety; faster and more efficient testing; and lack of problems with using master meters. Mr. Marc Buttler (Emerson Process Management – Micro Motion) also expressed supports of the items but suggested replacing the words "maximum discharge rate" with "maximum test rate" in proposed paragraph N.3.2.; the submitter agreed with the suggestion.

The Committee also heard comments in opposition to the item and comments emphasizing the need for further development and data. A new comment offered by Mrs. Tina Butcher (NIST OWM) was that the proposed new paragraph N.3.1. would create a conflict with the minimum test procedures outlined in the NIST EPO for CNG Retail Motor-Fuel Dispensers since tests conducted at the minimum measured quantity (MMQ) and at some other quantities are frequently completed in less than one minute. There was also some debate regarding the application of the Fundamental Considerations with regard to the allocation of error and uncertainty associated with a given test method and Mr. Henry Oppermann clarified the proper application of these criteria. Mr. Oppermann noted that transfer standards, in some cases, are no more accurate than the meter being tested and that the proposals lack a specification associated with the performance of the standard. He recommended the items be downgraded to Informational or Developmental.

During the Committee's work session, members of the Committee agreed that the comments received during the open hearings were mostly in support of the two proposals. The Committee discussed the proposed changes to the text, including the errors in the transcription of the text in the Item Under Consideration. The Committee discussed the potential impact on testing CNG dispensers, acknowledging that the proposed requirement cannot be met by someone wanting to apply the procedures in the NIST EPO (which were developed through a work group comprised of industry and regulatory officials). Some Committee members familiar with CNG testing concurred that a test run typically takes less than one minute to complete. The Committee was concerned with the potential conflict and questioned whether the submitter had fully considered the impact of the proposed language. These discussions led the Committee to decide to change the status of the item from Voting to Developing and return them to the submitter for further development.

See the Committee's 2016 Final Report for additional details.

In October of 2016, Mr. Keilty (submitter) amended the "original version" of the proposal to the following updated version, which was considered at the 2017 NCWM Interim and Annual Meetings:

Amend NIST Handbook 44 Mass Flow Meters Code as follows:

N.3. Test Drafts. –

N.3.1 Minimum Test - The minimum test shall be one test draft at the maximum flow rate of the installation and one test draft at the minimum flow rate. More tests may be performed at these or other flow rates. (See T.3. Repeatability.)
(Amended 20XX)

N.3.2. Transfer Standard Test. – The minimum quantity for any test draft shall be equal to or greater than the amount delivered in one minute at the flow rate being tested.

Editorial note: An amended date (of "1982") that appeared beneath paragraph N.3.1. of this proposal when it was considered by the NCWM in 2017 has been editorially changed in this report to reflect the changes being proposed to the paragraph are the first since the paragraph was added to the Mass Flow Meters Code.

During the 2017 NCWM Interim Meeting, the Committee grouped Agenda Item 3302-1 and 3307-2 together and took comments on these items simultaneously because it considered these items related.

Mr. Michael Keilty (Endress & Hauser Flowtec AG USA), submitter of the item, commented that this was a Voting item at the 2016 NCWM Annual Meeting where it was downgraded to a Developing status. He further offered the opinion that there was not a good mechanism for relaying back to the submitter what an item needs in the way of development. Having now submitted the item with amended language, he said that he would like to see this item put to a vote.

As was the case during open hearings of the Committee in 2015 and 2016, similar comments were received both in support of and in opposition to this item and the corresponding item in the Mass Flow Meters Code in 2017.

Mrs. Tina Butcher (NIST OWM) spoke of the need for standards used in testing to comply with the tolerances for standards specified in HB 44 Appendix A - Fundamental Considerations which, she noted, requires the combined error and uncertainty of any standard used without correction to be less than one-third the applicable device tolerance. She also made evident the potential for more than one type of standard to be used in testing, noting that the tolerances specified the Carbon Dioxide Liquid-Measuring Devices Code of HB 44 increase for different test methods. She stated that the proposal seemed to address only one particular type of transfer standard, (i.e., a master meter) and, as a result, the proposal could have a very limiting effect on the types of transfer standards that can be used. She also questioned the use of the term "transfer standard" and suggested that the term, "field standard" may be a more appropriate term. As a final comment, she reiterated a previous OWM comment that more data is needed of comparisons to known standards.

Mr. Bruce Swiecicki (National Propane Gas Association), Mr. Constantine Cotsoradis (Flint Hills Resources), and Mr. Hal Prince (FL), supported the item and requested it move forward.

Mr. Ross Andersen (New York, retired) gave an example of alternative test methods being used for like applications, such as what the ASTM does. He stated that different test methods will have different results and that variables of those methods need to be evaluated. He commented that we are currently evaluating only one variable.

In consideration of the comments received on these two items, the Committee agreed to present them for vote at the 2017 NCWM Annual Meeting.

At the 2017 NCWM Annual Meeting, the Committee again grouped this item with Agenda Item 3307-2 and took comments on the two items at the same time. Several industry and regulatory officials voiced support to presenting the two items for vote. Some of those speaking in support of the items acknowledged that a lot of additional work still needed to be completed to confirm the adequacy of alternative test measures, such as a master meter, for use as a standard in testing commercial devices. The Committee was urged by some, however, to present the items for vote, noting that some states are already using alternative standards for testing and that the additional work needed to confirm their adequacy can be completed post adoption of the proposals.

There were also several who spoke in favor of maintaining the Developing status of the items. Mr. Steve Harrington (OR), for example, reported that the State of Oregon is pursuing the use of a mass flow meter standard for use in testing LPG meters. He noted that additional work is needed to develop procedures that will confirm the adequacy of the mass flow meter (standard) for use in testing LPG meters used in commercial applications. He recommended maintaining the Developing status of the items.

Mrs. Tina Butcher (NIST OWM) reported that OWM believes the proposed changes are premature. More work is needed and OWM recommends maintaining the items as Developing. Mrs. Butcher provided an update on some ongoing work relating to alternative test methods and the current proposals under consideration. She also reiterated many of the points OWM had provided in previous NCWM Meetings relating to these two proposals. See the Committee's 2017 Final Report for details of Mrs. Butcher's update on the ongoing work relating to alternative test measures and a short summary list of the points OWM had raised during earlier NCWM Conferences regarding these proposals.

Mrs. Butcher also noted that OWM has a significant concern with the proposal in Agenda Item 3307-2 because proposed new paragraph N.3.1. conflicts with the minimum test of a CNG RMFD being performed today in accordance with the NIST EPO. A test conducted at the MMQ typically takes far less than a minute to complete. Additionally, the test drafts performed at one-third, two-thirds, and three-thirds test tank capacity often are completed in less than a minute's time.

Mr. Henry Oppermann, (Weights and Measures Consulting, LLC) speaking on his own behalf, as well as consultant for Seraphin Test Measure, Co. stated there is no clear understanding of the terms "field standard" and "transfer standard." Any standard proposed for use in testing must meet the tolerances for standards specified in the Fundamental Considerations (Appendix A) of HB 44 and there must be proof that the standard is able to comply with the tolerance over a range of field conditions. He raised the question, "without data to support the accuracy of a standard, how do you know it is accurate enough to use in testing a commercial device?" Mr. Oppermann expressed the need for the development of a test method (or procedures) that can be used to identify meters that perform well enough that they can be used as a standard in testing. Mr. Robert Murnane (Seraphin Test Measure, Co.) stated that he echoed Mr. Oppermann's comments. He acknowledged the existence of the national work group that NIST had created for the purpose of identifying the variables and parameters over which a proposed alternate standard must be tested and evaluated to ensure that the methodologies and standards facilitate measurements that have metrological traceability. He noted also that jurisdictions could already use alternative standards if controls are in place to validate their traceability. Mr. Oppermann and Mr. Murnane both forwarded written comments to the Committee in advance of the meeting opposing the adoption of these two items and recommending their status be changed from Voting to Developing.

Mr. Michael Keilty (Endress + Hauser Flowtec AG USA) stated he would entertain a change to the terminology (transfer standard) in his proposals. He reported that some jurisdictions will not allow the use of a transfer standard unless it is mentioned in HB 44. He said that he agreed with Mr. Murnane and Mrs. Butcher that procedures would still need to be in place to ensure the adequacy of that standard for use in testing a commercial device. He recommended the Committee present the two items for vote.

Based on the concerns raised by numerous members during the open hearings and recommendations from all four regional associations, the Committee felt the two items in the group had merit, but more work is necessary to move them forward and the Committee agreed to change the status to a Developing.

In September 2017, Mr. Kielty, once again, amended the proposal (to that shown in Item under Consideration); this time by changing the title of new proposed paragraph N.3.2. from "Transfer Standard Test" (the term used in earlier versions of the proposal) to "Field Reference Standard Meter Test."

During the 2018 NCWM Interim Meeting, the Committee heard comments from Mr. Michael Keilty (Endress & Hauser Flowtec AG USA), submitter of the item, stating his comments in item LPG-4, apply to this item as well and asked that this item (MFM-2) be moved to a Voting status.

Mr. Henry Oppermann (Weights and Measures Consulting, LLC) stated that his comments provided during the open hearing on all items in Block 5, also apply to this item. He spoke to the letter that he submitted concerning S&T Items 3302-1(LPG), 3307-2 (MFM), 3504-2 (Taximeters) and 3600-6 (Transportation Network Measuring Systems) and recommended the item remain Developing.

Mr. Constantine Cotsoradis (Flint Hills Resources) commented that he agrees with the comments Mr. Oppermann provided in his letter that more data is needed. However, he encourages the use of "field reference standard meters," or whatever they ultimately are called, because they provide a better test than the currently accepted practice of a vehicle scale being used for reference. He feels this method has too many uncertainties.

During the Committee's work session, the members considered the comments heard on this item. The Committee agreed to recommend this item remain Developing. The Committee also agreed that items LPG-4, MFM-2, and all Block 5 items are related to the Block 4 items due to terminology. The Committee recommends the submitter of the Block 4 items (OWM) provide detail of their developing language to the submitter of the related items (Endress & Hauser Flowtec AG USA) to prevent conflicting terms as they are considered during future meetings.

The Committee did not take comments during open hearings on Developing items at the 2018 NCWM Annual Meeting except to grant the submitter of a Developing item (or block of Developing items) an opportunity to provide an update on the progress made to further develop the item(s) since the 2018 NCWM Interim Meeting. At the 2018 NCWM Annual Meeting, the Committee received an update from the submitter of this item, Mr. Michael Keilty (Endress + Hauser Flowtec). Mr. Keilty stated that the item is fully developed and urged the Committee to present this item for a vote in 2019.

As feedback to the submitter and as part of its analysis of the S&T Committee's 2018 agenda items, OWM provided joint written recommendations and comments to this item and item LPG-4, which OWM considers similar. Refer to Item LPG-4 of this report to view OWM's comments for these two items.

In consideration of the update provided by the submitter, and the analysis from OWM, the Committee agreed that the terminology in this item should align with the terminology that will be used in the NIST OWM's Block 4 items (B4) that are still being developed. The Committee agreed that the item should remain a Developing item on its agenda in 2019 and recommends that the OWM provide detail on its Developing items in Block 4 to the submitter so that they can better align.

Regional Association Comments:
During the WWMA's fall 2017 Annual Meeting, the WWMA agreed to recommend this item be withdrawn. The requirement in proposed N.3.1 Minimum Test requiring the minimum test shall be one test draft at the maximum flow rate of the installation is not possible for current testing equipment or NIST EPO's including gravimetric or flow meter testing of CNG retail motor fuel devices.

At the SWMA's fall 2017 Annual Meeting, Mrs. Tina Butcher (NIST OWM) provided comments on this item and item 3307-2 noting that Mr. Val Miller (NIST OWM) will be looking at master meters and considering the development of a NIST Handbook 105-X, which might address master meters. She noted that the issue of "master meters" is very broad and that it is necessary to consider the specific type (technology) of master meter used and the application where it will be used. During its work session, the SWMA S&T Committee noted that the Measuring Sector also considered these items and is beginning work to address the use of one specific type of master meter as a starting point for developing further criteria for use in type evaluation. The Committee also acknowledged that Mr. Bob Murnane (Seraphin Test Measure) provided written comments on this issue (see also the SWMA's comments under Item New-6). The SWMA supports the concept of using "master meters" (and acknowledged that other terms have been and are being proposed) for various metering applications. The SWMA believes there is still confusion over the terminology and that it is difficult to review multiple items related to the same basic issue. The SWMA recommended this item remain Developing.

The CWMA recommended this item be designated as a Developing item at both its fall 2017 Interim and spring 2018 Annual Meetings. The CWMA reported receiving statements from Seraphin Test Measure requesting the item be Developing. The CWMA agreed too that the year "1982" be removed.

NEWMA recommended this item be designated as a Developing item at both its fall 2017 Interim and spring 2018 Annual Meetings. At its 2017 Interim Meeting NEWMA reported that the item had been recently modified by the submitter and is currently being developed. The item has merit. At its 2018 Annual Meeting, NEWMA reported there were no comments received on the item and that the language was still being developed and shares a relationship with Block 4, Block 5, and LPG-4 items.
Additional letters, presentations, and data may have been submitted for consideration with this item. Please refer to **www.ncwm.com/interim-archive** to review these documents.

TXI – TAXIMETERS

TXI-1 V S.1.2.2. Distance Mechanism and S.1.5.3. Distance Not Recording.

(This item was Adopted.)

Source:
NIST OWM (2018)

Purpose:
Amend the effective date for the nonretroactive status for two paragraphs (S.1.2.2. Distance Mechanism, and S.1.5.3. Distance not Recording) to allow a reasonable time period for taximeter manufacturers to bring their devices in compliance.

Item under Consideration:
Amend NIST Handbook 44, Taximeters Code as follows:

> ***S.1.2.2. Distance Mechanism.*** *– Means shall be provided on all taximeters designed to calculate fare based on a combination of time elapsed and/or distance traveled to enable the vehicle operator to render the distance mechanism either operative or inoperative with respect to the fare-indicating mechanism.*
> *[Nonretroactive as of January 1,* ***~~2018~~*** ***<u>2020</u>****]*
>
> (Added 2017)
>
> ***S.1.5.3. Distance Not Recording.*** *– When a taximeter is set for fare registration with the distance mechanism inoperative, it shall indicate "Distance Not Recording" or an equivalent expression.*
> *[Nonretroactive as of January 1,* ***~~2018~~*** ***<u>2020</u>****]*
>
> (Added 2017)

Background/Discussion:
Paragraphs S.1.2.2. and S.1.5.3. are newly added requirements in the HB 44 Taximeters Code that would require a mechanism be included on a taximeter that would disable or suspend the use of distance measurements for the calculation of fare charges. It is not believed that any existing taximeters are equipped with such a feature at this time and that this would be a design change affecting most if not all taximeter manufacturers. It was recognized after these amendments had been voted on and adopted at the July 2017 NCWM Annual Meeting that these proposals did not specify an effective date but, instead, listed that effective date as *"Nonretroactive as of January 1, 20XX."* Unless specified otherwise, it is customary to assign an effective date for a requirement as January 1 in the year following the requirement's adoption, in this case January 1, 2018.

Since no specific year was provided as an effective date for these two requirements, it is inferred that there was no intent to provide additional time for manufacturers of these devices to redesign their products to incorporate a feature that could disable the use of distance travelled as a means to calculate fare charges.

Because the changes required would likely cause taximeter manufacturers to redesign software and hardware elements in their product line, it is considered reasonable to provide additional time for the necessary changes to be incorporated into new devices. Amending the nonretroactive effective dates from January 1, 2018 to January 1, 2020 would provide taximeter manufacturers an additional two years to incorporate the necessary changes in their new products.

Taximeter manufacturers may oppose the proposed effective date of January 1, 2020 if they do not believe they will be capable of complying with the required changes to their products in the time allotted (from the present until 2020) prior to the requirement being enforced.

During the 2018 NCWM Interim Meeting, the Committee heard supporting comments from Mr. Mike Sikula (NY) and Ms. Kristin Macey (CA). The Committee agreed to move the item forward as Voting.

During open hearings at the 2018 NCWM Annual Meeting, Mrs. Tina Butcher provided the Committee a brief summary of the reasons why OWM had submitted this item. She reported that when paragraphs S.1.2.2. and S.1.5.3. were adopted by the NCWM in 2017, no specific nonretroactive date was specified. The customary practice in this situation is to assign an effective date of January 1 of the year following the adoption of the paragraph. OWM had concerns about the impact of the new requirements on taximeter companies who may not be able to comply with those requirements by the 2018 effective date. In most cases, manufacturers would likely need to redesign existing taximeters in order to meet the new requirements. OWM supports changes to the proposal to allow manufacturers additional time to comply. Amending the nonretroactive effective dates from January 1, 2018 to January 1, 2020 would provide taximeter manufacturers additional time to incorporate the necessary changes in their new products.

Considering OWM's rationale for submitting the proposal and hearing no comments in opposition to extending the date of enforcement of these two paragraphs an additional two years, the Committee agreed to present the item for Vote.

Regional Association Comments:
The WWMA agreed, at its fall 2017 Annual Meeting, to recommend this item as a Voting item on the NCWM agenda as the proposal corrects this section of the code to bring it into conformance with the original intent allowing the industry time to comply with the requirements.

During the fall 2017 SWMA Meeting, the Committee heard comments from Mrs. Tina Butcher (NIST OWM), who provided history of the item. She noted that, when revisions were made to the Taximeters Code in July 2017, there was an oversight in designating a specific non-retroactive date; a date of 20XX was specified in the proposal when it was adopted. The standard approach for addressing a "20XX" date has been to use a date of the subsequent calendar year. Thus, OWM used 2018 as the specified date. However, there were concerns that taximeter manufacturers may have been anticipating a later date. Consequently, OWM polled the USNWG on Taximeters and based on that poll is proposing a modification to the date as specified in the proposal. The Committee heard no other comments or opposition to the proposed change and the SWMA recommended this item be a Voting item on the NCWM agenda.

During the CWMA's fall 2017 Interim Meeting, Mr. Don Onwiler (NCWM) explained there was an oversight in the timing of the implementation date which could adversely affect industry. There were no comments received on this item during the CWMA's spring 2018 Annual Meeting. At both meetings, the CWMA recommended this item as a Voting item on the NCWM agenda.

NEWMA recommended this item move forward as a Voting item at both its spring 2017 Interim Meeting and fall 2018 Annual Meeting NEWMA reported a belief the item is fully developed and is supported by those providing comment on the item during open hearings.

Additional letters, presentations, and data may have been submitted for consideration with this item. Please refer to **www.ncwm.com/interim-archive** to review these documents.

OTH – OTHER ITEMS

OTH-5 D Electric Watthour Meters Code under Development

Source:
NIST OWM (2016)

Purpose:

1) Make the weights and measures community aware of work being done within the U.S. National Work Group on Electric Vehicle Fueling and Submetering to develop proposed requirements for electric watthour meters used in submeter applications in residences and businesses;

2) Encourage participation in this work by interested regulatory officials, manufacturers, and users of electric submeters.

3) Allow an opportunity for the USNWG to provide regular updates to the S&T Committee and the weights and measures community on the progress of this work;

4) Allow the USWNG to vet specific proposals as input is needed.

Item under Consideration:
Create a Developing Item for inclusion on the NCWM S&T Committee Agenda where progress of the USNWG can be reported as it develops legal metrology requirements for electric watthour meters and continues work to develop test procedures and test equipment standards for electric vehicle refueling equipment.

This Developing Item is included on the Committee's agenda (and a corresponding item is proposed for inclusion on the L&R Committee Agenda) to keep the weights and measures community apprised of USNWG current projects, including the following:

- The USNWG continues to develop recommended test procedures for inclusion in a new EPO 30 for Electric Vehicle Refueling Equipment along with proposed requirements for field test standards.

- The USWNG is continuing work to develop a proposed code for electricity-measuring devices used in sub-metering electricity at residential and business locations. This does not include metering systems under the jurisdiction of public utilities. The USNWG hopes to have a draft code for consideration by the community in the 2016-2107 NCWM cycle.

The USNWG will provide regular updates on the progress of this work and welcomes input from the community.

For additional information, contact USNWG Chairman Mrs. Tina Butcher at **tbutcher@nist.gov** or 301-975-2196 or Technical Advisor, Mrs. Juana Williams at **juana.williams@nist.gov** or 301-975-3989

Background/Discussion:

Note: This agenda item appeared on the Committee's 2017 agenda as Agenda Item 3600-1.

In 2012, NIST OWM formed the U.S. National Working Group on Electric Vehicle Fueling and Submetering to develop proposed requirements for commercial electricity-measuring devices (including those used in sub-metering electricity at residential and business locations and those used to measure and sell electricity dispensed as a vehicle fuel) and to ensure that the prescribed methodologies and standards facilitate measurements that are traceable to the International System of Units (SI).

In 2013, the NCWM adopted changes recommended by the USNWG to the NIST Handbook 130 requirements for the Method of Sale of Commodities to specify the method of sale for electric vehicle refueling. At the 2015 NCWM

Annual Meeting, the NCWM adopted NIST Handbook 44 Section 3.40 Electric Vehicle Refueling Systems developed by the USNWG.

The creation of Developing Items on both the L&R and S&T Committee agendas will provide for a venue to allow the USNWG to update the weights and measures community on continued work to develop test procedures and test equipment standards. This item will also provide a forum for reporting on work to develop proposed method of sale requirements for electric watthour meters and a tentative device code for electric watthour meters in residential and business locations and serve as a placeholder for eventual submission of these proposals for consideration by NCWM.

The Committee received an update on this item from Mrs. Tina Butcher (NIST OWM), Chairman of the USNWG on Electric Refueling & Submetering at the 2016 and 2017 NCWM Interim and Annual Meetings. See the Committee's 2016 and 2017 Final Report for details of those updates.

During the 2018 NCWM Interim Meeting, no comments were heard on this item and the Committee agreed to maintain its Developing status.

The Committee did not take comments during open hearings on Developing items at the 2018 NCWM Annual Meeting and agreed to allow only the submitter of a Developing item (or block of Developing items) to provide an update on the progress made to further develop the item(s) since the 2018 NCWM Interim Meeting. The Committee received the following update on this item from Mrs. Tina Butcher (NIST OWM), Chair of the USNWG on Electric Refueling & Submetering:

- The Electric Watthour Meter Subgroup (SG) of the USNWG on Electric Vehicle Fueling & Submetering held several in-person meetings since the 2017 NCWM Annual.

- Meetings included web conferencing to help those who cannot attend in person.

- The SG has developed a proposed addition to NIST Handbook 130's Uniform Regulation for the Method of Sale of Commodities to specify a method of sale for electrical energy sold through watthour type submeters under W&M jurisdiction.

- The proposal will be presented for consideration by the Regional W&M Associations and the NCWM in the 2019 NCWM cycle.

- The SG looks forward to comments on the proposed language as it moves through the process.

- Some technical and editorial changes may be needed to address comments received; however, the SG expects the proposal will be ready for NCWM vote in 2019.

- The SG is steadily working on a proposed code for NIST Handbook 44 to address specifications, tolerances, and other requirements for metering systems.

- The SG expects to have a draft HB 44 code ready for the 2020 NCWM cycle.

- The SG will meet for a short web-conference on August 29, 2018 and is planning its next in-person meeting for February 2019 in Sacramento, California.

- Those interested in participating in the work on Electric Watthour Meters should contact Subgroup Chairman, Ms. Lisa Warfield, (NIST OWM) or Technical Advisor Mrs. Tina Butcher (NIST OWM).

The Committee agreed to carryover this item on its agenda for consideration in the 2019 NCWM Conference cycle.

Regional Association Comments:
The WWMA agreed at its fall 2017 Annual Meeting to recommend this item be forwarded to the NCWM S&T Committee as a Developing item since there is continuing work by the US National Work Group.

At the fall 2017 Annual Meeting, the SWMA heard an update on this issue from Mrs. Tina Butcher (NIST OWM) submitter of this item. Mrs. Butcher reported the USNWG on Electric Vehicle Refueling and Submetering has begun work on development of a draft NIST Handbook 44 code for utility type electric watthour meters used in submetering applications. She indicated the group held a face-to-face meeting in Sacramento, CA in mid-September and has made good progress on the draft code. The group plans another short meeting in November followed by another, longer meeting in early spring. The group hopes to finish review and revision of the code and submit a final draft for review by the regions in fall 2018. NIST OWM will continue to provide updates on the Work Group's progress and encourages anyone interested in participating in the work (as an active member or observer) to contact Work Group Chairman or Technical Advisor. The SWMA recommended this item remain Developing.

The CWMA S&T Committee heard no comments on this item at the fall 2017 CWMA Interim Meeting. At its spring 2018 Annual Meeting, Ms. Lisa Warfield (NIST OWM) provided an update on a proposal to establish a method of sale for watthour meters, which will be made available in the fall 2018. The CWMA recommended the item as a Developing item on the NCWM agenda.

At both the fall 2017 Interim and spring 2018 Annual Meetings of NEWMA, it was reported that this item is still being worked on and developed by the Electric Watthour Meter Subgroup of the USNWG on Electric Vehicle Fueling & Submetering. NEWMA recommended the item remain Developing at both meetings.

Additional letters, presentations, and data may have been submitted for consideration with this item. Please refer to **www.ncwm.com/interim-archive** to review these documents.

OTH-6 D Appendix D – Definitions: Batch (Batching)

Source:
Kansas (2018)

Purpose:
To clarify when batching is a metrologically significant event.

Item under Consideration:
Amend NIST Handbook 44, Appendix D. Definitions and follows:

> **<u>batch (batching) - The combining or mixing of two or more materials or ingredients using weighing and/or measuring devices or systems to produce a finished product whose quantity is determined from the summation of those weights and/or measurements.</u>**
>
> **<u>(Added 20XX)</u>**

Background/Discussion:

Note: This agenda item appeared on the Committee's 2017 agenda as Agenda Item 3600-3.

"Batch" or "batching" are terms used to define devices in Sections 2.20, 3.36, and in several definitions in Appendix D of HB 44. Yet there is no guidance for the regulatory official to determine what constitutes a "batch" or "batching" operation. Section 2.20 Scales has a specification, S.1.2. Value of Scale Division Units, and a tolerance, T.3. Sensitivity Requirement, Equilibrium Change Required (subsection (c) Scale with a Single Balance Indicator and Having a Nominal Capacity of 250 kg (500 lb) or Greater) that have different criteria for batching scales than for other types of scales. Section 3.36 Water Meters has a specification, test procedure, and user requirement that are specifically for "batching meters." This definition will help manufacturers, users, and regulators determine when batching is metrologically significant and promote consistency in the way the devices are evaluated.

To many weights & measures officials, it may seem obvious what is implied by the terms "batch" or "batching." As the number of devices that don't conform to the common conception of what a batching device is increases, there is a greater need for defining what the term means.

During the 2018 NCWM Interim Meeting, the Committee heard from Mr. Loren Minnich (KS) advising the Committee members that an amended definition of 'batching' had been provided to the Committee for consideration. Mr. Minnich recommended the Committee replace the definition in the current proposal with the amended version provided. If the Committee could not agree to replace the definition, he asked the Committee to continue maintaining the item on its agenda.

Mr. Russ Vires (Mettler-Toledo, LLC) speaking on behalf of the Scale Manufacturers Association (SMA) stated that the SMA was opposed to the item and that "batching" is not a commercial application.

Mr. Richard Suiter (Richard Suiter Consulting) stated that the item is required, that batching is often a commercial application and that the item should be moved forward to a Voting status.

During the Committee's work session, Committee members considered the amended definition provided by Mr. Minnich and agreed to replace the definition in the proposal with that shown in Item under Consideration.

The following definition represents the version of the definition that was replaced by the Committee:

> **batch (batching). – The separate weighment or measurement of two or more products consecutively, using the same load receiving or measuring element, without emptying or re-zeroing the device between weighments or measurements. Batching may be performed by many kinds of devices including but not limited to Scales and Automatic Bulk Weighing Systems.**

The Committee felt it was inappropriate to have two items dealing with the same subject move forward as Voting (i.e., this item and Item ABW-4). Considering the comments from the submitter of this item, the Committee agreed to maintain this item as Developing, having designated ABW-4 a Voting item.

The Committee did not take comments during open hearings on Developing items at the 2018 NCWM Annual Meeting and agreed to allow only the submitter of a Developing item (or block of Developing items) to provide an update on the progress made to further develop the item(s) since the 2018 NCWM Interim Meeting. There was no update provided by the submitter of this Developing item during the Committee's open hearings at 2018 NCWM Annual Meeting.

The Committee received written comments in favor of item OTH-6 from Mr. Henry Oppermann (Weights and Measures Consulting) supporting the definition for batching scales. Mr. Oppermann stated that this definition correctly and specifically describes the operation of the scales that should be classified as batching scales.

Members of the Committee agreed to carryover this item on its 2019 agenda as a Developing item. The Committee looks forward to the further development of this item by the submitter.

Regional Association Comments:
During its fall 2017 Annual Meeting, the WWMA agreed to recommend this item be withdrawn because it does not feel this term needs to be defined based on its current use in Handbook 44. In addition, this definition identifies only one type of batching operation when there are many different uses of the term "batch (batching)" currently in use.

During Committee open hearings at the SWMA's fall 2017 Annual Meeting the SWMA's S&T Committee received comments from Mr. Richard Suiter (Richard Suiter Consulting), who opposed the proposal, noting that the definition conflicts with many systems that are currently in the field. The definition only refers to one type of system. The

Committee received no other comments on the item. Given the comments received in opposition to the proposal and the other items addressing batching systems, the SWMA recommended the item be withdrawn.

During the CWMA's fall 2017 Interim Meeting, the submitter chose to withdraw this item based on the inability to reach a consensus on the definition of "batch." During the 2018 NCWM Interim Meeting, however, the submitter of this item presented a modified version of the definition to the NCWM S&T Committee for consideration in replacing the original definition in the proposal, to which the Committee agreed. The CWMA, at it spring 2018 Interim Meeting recommended the item as a Developing item on the NCWM agenda.

NEWMA, at its fall 2017 Interim Meeting reported receiving no comments on this item and recommended it be provided a Developing status. At NEWMA's spring 2018 Annual Meeting, NEWMA recommended withdrawing the item, noting the SMA's opposition to the item because batching systems are not commercial devices and therefore should not be included in HB 44.

Additional letters, presentations, and data may have been submitted for consideration with this item. Please refer to **www.ncwm.com/interim-archive** to review these documents.

Mr. Ivan Hankins, Iowa | Committee Chair
Mr. Tim Chesser, Arkansas | Member
Ms. Rachelle Miller, Wisconsin | Member
Mr. Josh Nelson, Oregon | Member
Mr. Brad Bachelder, Maine | Member
Mr. Luciano Burtini, Measurement Canada | Canadian Technical Advisor
Mr. Rick Harshman, NIST, OWM | NIST Technical Advisor
Mr. Darrell Flocken, NCWM | NTEP Technical Advisor

Specifications and Tolerances Committee

Professional Development Committee (PDC)

2018 Final Report

Ms. Lori Jacobson, Committee Chair
South Dakota

INTRODUCTION

This is the final report of the Professional Development Committee (PDC) (hereinafter referred to as the "Committee") for the 103rd Annual Meeting of the National Conference on Weights and Measures (NCWM) held in Tulsa, Oklahoma, July 15 – 19, 2018. This report is based on the Interim Report offered in the NCWM Publication 16, "Committee Reports," testimony at public hearings, comments received from the regional weights and measures associations and other parties, the addendum sheets issued at the Annual Meeting, and actions taken by the membership at the voting session of the Annual Meeting. The Informational items shown below were adopted as presented when this report was approved.

Table A identifies the agenda items by reference key, title of item, page number and the appendices by appendix designations. The acronyms for organizations and technical terms used throughout the agenda are identified in Table B. The first four digits of an item's reference key are assigned from the Subject Series List The status of each item contained in the report is designated as one of the following: **(D) Developing Item:** the Committee determined the item has merit; however, the item was returned to the submitter or other designated party for further development before any action can be taken at the national level; **(I) Informational Item:** the item is under consideration by the Committee but not proposed for Voting; **(V) Voting Item:** the Committee is making recommendations requiring a vote by the active members of NCWM; **(W) Withdrawn Item:** the item has been removed from consideration by the Committee.

Table C provides a summary of the results of the voting on the Committee's items and the report in its entirety. Some Voting Items are considered individually; others may be grouped in a consent calendar. Consent calendar items are Voting Items that the Committee has assembled as a single Voting Item during their deliberation after the Open Hearings on the assumption that the items are without opposition and will not require discussion. The Voting Items that have been grouped into consent calendar items will be listed on the addendum sheets. Prior to adoption of the consent calendar, the Committee will entertain any requests from the floor to remove specific items from the consent calendar to be discussed and voted upon individually.

Proposed revisions to the handbook(s) are shown as follows: 1) deleted language is indicated with a **bold face font using ~~strikeouts~~** (e.g., **~~this report~~**), and 2) proposed new language is indicated with an **underscored bold-faced font** (e.g., **new items**). When used in this report, the term "weight" means "mass".

Note: The policy is to use metric units of measurement in all its publications; however, recommendations received by NCWM technical committees and regional weights and measures associations have been printed in this publication as submitted. Therefore, the report may contain references to U.S. customary units.

Subject Series List

Table A
Table of Contents

Reference Key	Title of Item	PDC Page

Table B
Glossary of Acronyms and Terms

Acronym	Term	Acronym	Term
ADDIE	Analysis, Design, Development, Implementation, and Evaluation	NEWMA	Northeastern Weights and Measures Association
ANSI	American Nation al Standards Institute	NIST	National Institute of Standards and Technology
BOK	Body of Knowledge	OWM	Office of Weights and Measures
CWMA	Central Weights and Measures Association	PDC	Professional Development Committee
ISO	International Standardization Organization	RSA	Registered Service Agents
ICE	Institute for Credentialing Excellence	SME	Subject Matter Expert
NCWM	National Conference on Weights and Measures	SWMA	Southern Weights and Measures Association
		WWMA	Western Weights and Measures Association

Details of All Items
(In order by Reference Key)

EDU – EDUCATION

EDU-1 I Professional Certification Program

Professional certifications are offered in many professions as a means of demonstrating competence in a specific field of expertise. Certification may be a means of qualifying an individual for employment or a higher pay grade within a profession. The NCWM Professional Certification Program provides confidence that an individual has a strong understanding of U.S weights and measures standards as adopted by NCWM and published in NIST Handbooks, 44, 130, and 133.

Professional certification is available to NCWM members and non-members alike within the private and government sectors. Please note that the person taking the test must be an NCWM member to take the exams for free. Professional Certifications are now available in six areas covering (in order of deployment): Retail Motor Fuel Devices, Small Capacity Scales Class III, Package Checking – Basic, Medium Capacity Scales, Large Capacity Scales, and Vehicle-Tank Meters.

The Committee is encouraged to see states and industry utilizing the program in positive ways. Entities are incorporating certification as a part of probation requirement for new hires. While others use them as an important part of their training programs to measure progress. Some states have even used certifications to justify additional compensation or changes in classification.

In December 2016, the Certification Coordinator delivered the materials for two new, basic competency exams. The NCWM staff is in the process of posting these exams to the testing website. The basic competency exams were created to provide an objective measure of development of new hires among regulatory officials and potentially test service agents for basic knowledge of weights and measures requirements. However, deployment of these new exams is on hold until the NCWM can establish a proctoring system to better ensure the integrity of the testing process. (See discussion later in this item.)

Work continues on additional certification exams. Priorities had been set to complete LPG Meters, Precision Scales, and Price Verification. The PDC is always looking for additional Subject Matter Experts (SME) volunteers for all active projects. Any interested parties should contact Mr. Andersen through NCWM Office at **info@ncwm.net** or at (402) 434-4880 for further details. The SME volunteers are the real heart of the certification program. The successful creation of these exams is dependent on willing volunteers.

All materials for the Professional Certification Program may be found on the NCWM website, by holding your pointer over the Professional Certification title on the top navigation bar. You can find all the existing modules with learning objectives at the same location by selecting Body of Knowledge. The Body of Knowledge page shows the curriculum workplan. There you will find the hyperlinked active modules. Select your study program of choice and download to your computer. The NCWM modules are intended for wide distribution and may be freely copied.

Status of Current Tests

The NCWM has issued 778 professional certificates from the inception of the Professional Certification Program to September 30, 2017. Of the certificates issued, eleven have been issued to individuals in the private sector (three for small scales, two for package checking, and one for retail motor-fuel dispensers). The balance of the certificates has been issued to regulators. It is important to note that some of the early certificates have reached their 5-year expiration. Those who earned certificates over five years ago will need to seek recertification.

The Committee is working with NCWM staff to alert certificate holders prior to expiration. Both the Committee and NCWM are hopeful this will help facilitate with recertification. The NCWM Executive Director has advised the Committee he will work with staff to begin notifying expiring certificates holders several months in advance. This would allow certificate holders time to prepare in retaking the exams.

Number of Certificates NCWM Has Issued as of the end of Fiscal Year 2016 (September 30th)							
	FY 10-11	**FY 11-12**	**FY 12-13**	**FY 13-14**	**FY 14-15**	**FY 15-16**	**FY 16-17**
Count in Year	44	94	106	60	199	135	140
Cumulative	44	138	244	304	503	638	778

Certification (posted)	**Certificates**
RMFD (5/2010)	306
Small Scales (8/2012)	179
Package Checking (8/2012)	111
Medium-Capacity Scales (4/2015)	75
Large-Capacity Scales (4/2015)	55
Vehicle-Tank Meters (4/2015)	52

The following map includes the states with individuals holding an active certificate in one or more disciplines. Please note that the eleven active certificates issued to private sector individuals are included in these figures, the two certificates in Arkansas are private sector individuals. This data only includes certificates which have not expired as of September 30, 2017. The list shows those states with the highest utilization of the program. The table values include activity since program inception and may include expired certificates.

State	**Certificates**
Missouri	102
Minnesota	92
Maryland	70
Washington	48
Mississippi	45
Virginia	41
Kansas	36
Wisconsin	36
Nebraska	33
California	30
Alaska	25
North Carolina	25
New Mexico	23
Nevada	22

More information on current exam utilization and results may be found in Appendix A.

Certification Program Improvement

The Committee continually works to improve the exams and the exam experience. A key goal is to make sure the exams stay meaningful and current as handbook changes are made. This includes an annual review of the current exams by the Certification Coordinator.

At the regional meetings candidates expressed concern there was insufficient time to complete Part 1 of the Package Checking Exam. Analysis of FY 2016/17 data indicated many people used all time allowed for Part 1. Comparisons with previous years indicated the same problem existed, but to a lesser extent. The Committee reviewed the analysis and agreed to move five minutes from Part 2 to Part 1.

In order to obtain valuable feedback on the Certification Program, the Committee has created an exit survey which will be implemented using Survey Monkey. The questions on the exit survey will address some general assessment of the candidate's position and experience, mechanics of taking the exam, preparation for taking the exam, and general feedback (e.g., How did the candidate react to the content of the exam? Was it challenging? Was it too easy? Did the candidate feel the exam was fair?). The Committee will be working with NCWM staff to deploy the survey. When it is ready, we will create links to the survey from the NCWM website and possibly also include the link with the email of the exam results. We highly encourage candidates to take the survey after their exam experience.

Proctoring

The Committee keeps the goal of accrediting the Professional Certification Program as an important long -term objective. The PDC endeavors to create an infrastructure which will eventually support accreditation. Proctoring is an infrastructure item we believe necessary to accreditation. The Committee worked on a set of guidelines for proctoring. These guidelines impact both the candidate and the proctor. For the candidate, the guidelines will prohibit bringing materials into or taking materials out of the exam, having a cell phone activated, accessing the internet or other computer programs while taking the exam, etc. For the proctor, the guidelines will establish who can serve as a proctor (with approval of NCWM). The Committee is looking at allowing state weights and measures divisions to provide the proctor but is recommending that the proctor be someone other than an immediate supervisor. It could be someone from the personnel department or some independent third party. The guidelines specify what the proctor must provide to the candidate, such as: scrap paper, clean copies of pertinent NIST Handbooks, computer access, a quiet environment to take the exam, etc. It further requires the proctor to collect all scrap paper, as no written materials may be removed from the testing site in order to protect the integrity of the questions.

At the Interim Meeting the Committee provided a revised draft of the guidelines to the Board for final action.

Regional Association Comments:

At its 2017 Annual Meeting, the WWMA heard the following comments during its open hearings:

- The first certification exams are nearly five years old. Will certificate holders receive notification about pending expiration of certifications and notice to recertify?
- The charts show there are quite a few states that have not had employees participate with the certification exams. Can NCWM find out the barriers and impediments to participation? Perhaps send out a survey or convene a focus group for this purpose.

The WWMA recommended this item be retained as an Information Item on the NCWM PDC's Agenda.

At its 2017 Annual Meeting, the SWMA received no comments on this item and recommended it be retained as an Information Item on the NCWM PDC's Agenda.

At its 2017 Interim Meeting, the CWMA heard comments from Mr. Don Onwiler (NCWM), who mentioned that proctoring is mandatory to be a certified program and a director or designated individual is permissible to be the proctor. Test questions are reviewed annually and are taken from the most current version of the handbooks. A question was raised that individuals want to know what they missed, but Don said this would be considered training. This cannot be done to be accredited. Mr. John Albert (Missouri) indicated his inspectors preferred to repeat tests without a cooling off period. The CWMA recommended retaining this item as an Information Item on the NCWM PDC's Agenda.

At its 2017 Interim Meeting, NEWMA reported it was very pleased to hear that some jurisdictions are using the exams and certifications to justify increases in compensation for inspection staff and supports informing other jurisdictions of this possibility. Incentives can be used to encourage an increase in the participation rate for the Professional Certification Program which can have a positive impact on knowledge, skills, and professional development in the Weights & Measures community. NEWMA supports moving the basic competency exams forward in hopes that they can be utilized for new inspection staff and service company employees. The Committee supports considering ways to make the pass-fail rate statistics for the Professional Certification exams available to members. An example could be a supporting document to the NCWM Publication 16 Report, accessible through a web link. This would make more information accessible without having to include a significant amount of printed information in Publication 16. NEWMA supports moving the proctoring process forward and addressing questions and defining requirements for the proctoring process. NEWMA recommends working with the Board of Directors to answer questions of the proctoring issue. NEWMA recommended retaining this item as an Information Item on the NCWM PDC's Agenda.

Mr. Ross Andersen (Certification Coordinator) announced work was progressing with NIST OWM to implement TP-27 (an LPG table), a product of the API, ASTM and Gas Processors Association. The work also corrected minor errors in another table used to calculate uncompensated (gross) errors. OWM used the new table at a June 2018 Ohio training. OWM plans to make a broad distribution of the new tables in the near future. This will not require states to make procedural changes to calculations or forms, but to simply substitute the new tables. The NCWM exam will use the newly updated OWM tables and plans to publish them with the exam announcement. This will allow people to become familiar with the tables prior to taking the exam.

The Committee was pleased the Board approved the finalization of rules for candidates and proctors at the Interim Meeting in January. Executive Director Mr. Onwiler worked with counsel to create legal terms of agreement for proctors which will be sent out directly. This will start the process of selecting proctors by the states. The Board decided to send a notice to state directors, allowing 30 days for states to get their proctors signed up. Upon the expiration of the 30 days, all exams require a proctor. Once proctoring in place, the NCWM can begin hosting the basic competency exams.

Under the proctoring agreement the proctor's organization will provide the computer access and ensure details in the proctoring agreement are met. Only materials authorized in the exam announcement will be allowed and materials will be collected before the candidate leaves the room.

At its spring meeting, the Board reviewed the proposed exit survey questions prepared by the Committee to get feedback of the certification exams. The Committee met during the Annual Meeting to respond to the Board's concerns regarding the length of the survey and necessity of specific questions. Both entities hope the survey will be implemented in the near future.

EDU-2 I Training

The purpose of this item is to share best practices and approaches to training in response to the broad training needs of weights and measures jurisdictions and to serve as a link to various training materials on the web.

Mrs. Tina Butcher (NIST OWM) has continued to provide updates on training provided to the weights and measures community by NIST OWM. Prior to the 2018 Interim Meeting, Mrs. Butcher submitted an update to the Committee of the NIST courses completed in 2017, and this information was included in the Committee's presentation during that meeting.

At the 2018 NCWM Annual Meeting, Mrs. Butcher (NIST OWM) reported on training provided over federal fiscal year 2017 (Oct 2016-Sept 2017) and plans for FY 18 and FY 19 as outlined below. This listing has been consolidated into a single list including the full span of dates. OWM will simplify this in the future by reporting activities on the calendar year.

All OWM Programs

- **Administrators' Workshop**

- April 2017 – NIST Gaithersburg, Maryland – 36 participants

Laws and Metric Program

- **NIST HB 130 - Packaging & Labeling**
  - December 2016 – Connecticut
  - April 2017 – Texas
  - June 2017 – Maryland (Industry Only Class)
  - September 2017– Minnesota
  - March 2018 – California
  - June 2018 – Ohio
- **NIST HB 130 - Price Verification**
  - May 2017 – NEWMA – New York
  - October 2017 – SWMA – Arkansas
  - February 2018 – California
  - May 2018 – Florida
  - October 26, 2018 – Baton Rouge, Louisiana
- **NIST HB 133 – Checking the Net Contents of Packaged Goods, Basic**
  - March 2017 – Illinois
  - March 2017 – North Carolina
  - October 2017 – California
  - March 2018 – Missouri
  - April 2018– Alabama
  - May 2018 – Florida
  - October 22-25, 2018 – Baton Rouge, Louisiana
  - November 5-8, 2018 – Needham Heights, Massachusetts
  - *Upcoming: April 1-4, 2019 – Gaithersburg. Maryland*
  - *Upcoming: April 15-18, 2019 – Glendale, Arizona*
- **NIST HB 133 – Chapter 4 – Count, Linear Measure, Area, Thickness**
  - October 2016 – California
- **NIST HB 133 – Chapter 3 – Volumetric**
  - February 2018 – California

Laboratory Metrology

- **Fundamentals of Metrology**

  - Oct 2016;
  - Jan 2017 (SIM only);
  - Feb 2017 (2 seminars);
  - June 2017
  - December 2017;
  - February 2018 (2 seminars);
  - April 2018; June 2018
  - *Upcoming: October 29 - November 2, 2018; Feb 4-8, 2019; Feb 11-15, 2019*

- **Mass Metrology Seminar**
  - Oct /Nov 2016;
  - March 2017;
  - May 2017
  - Oct/Nov 2017;
  - May 2018
  - *Upcoming: Oct 15-26, 2018; March 11-22, 2019*

- **Project-based Learning Applied to Metrology (12 students)**
  - November 2016 – Mexico

- **Advanced Mass Seminar**
  - August 2017
  - *Upcoming: August 13-23, 2018 and April 29-May 9, 2019*

- **Volume Metrology**
  - June 2017
  - June 2018
  - *Upcoming: August 12-16, 2019*

- **Balance and Scale Calibration and Uncertainties**
  - Jan 2018

- **Selecting Field Standards/Hoisting & General Safety**
  - NEWMA – May 2018 – New York
  - CWMA – May 2018 – Illinois
  - *Upcoming: September 2018 – WWMA - Wyoming*

  - *Upcoming: October 2018 – SWMA - FL*

- **Webinars –Multiple Sessions and Topics**
  - Topics including: Basic Uncertainty Concepts; Calibration Certification Evaluation; Calibration Method Validation; Conducting Management Reviews; Contract Reviews; Designing & Implementing OJT; Document Control; Traceability and Calibration Intervals; Internal Auditing; Intro to Blooms Taxonomy and Learning Objectives; Software Verification and Validation; State Lab Annual Submissions
  - Statistics in Laboratory Metrology (651 participants)

- **Lab Metrology "Info Hour" Webinars**
  - Informal webinars on a variety of topics such as Adjusting Calibration Intervals; Best Practices of Lab On-the-Job Training; ISO/IEC 17025; Measurement Assurance Assessments; Risk Assessments and New ISO 17025; Procedure Updates; Risk Assessments for the Essentials of Traceability; Procedure Updates; and Traceability Assessments for Laboratories (504 people participants to date)

- **Regional Measurement Assurance Programs (RMAPs)**
  - MidAmerica Measurement Assurance Program (MidMAP)
    - October 2016
    - October 2017
    - *Upcoming: October 1-4, 2018*
  - Southwestern Measurement Assurance Program (SWAP)
    - October 2016
    - October 2017
    - *Upcoming: September17-20, 2018*
  - Caribbean Measurement Assurance Program (CaMAP) - April 2017
  - Southeastern Measurement Assurance Program (SEMAP)
    - April 2017
    - April – May 2018
  - Western Regional Metrology Assurance Program (WRAP)
    - May 2017
    - May 2018
  - Northeast Measurement Assurance Program (NEMAP)
    - September 2017
    - *Upcoming: September 10-13, 2018*

Weighing and Measuring Devices

- **Compressed Natural Gas Metering Systems**

  - April 2017 – Utah
  - June 2017 – Indiana
  - April 2018 – California

- **LPG Liquid-Measuring Systems**
  - October 2016 – Alaska
  - April 2017 – Oregon
  - May 2018 – California
  - June 2018 – Ohio
  - *Upcoming: Spring 2019 - Tennessee*

- **Retail Motor-Fuel Dispensers**
  - June 2017 – California
  - October 2017 – Pennsylvania W&M Association – Pennsylvania

- **Vehicle-Tank Meters**
  - *Upcoming: Spring 2019 - Kansas*

- **Livestock and Animal Scales**
  - June 2017 – Kansas Sept 2017 – WWMA – Arizona
  - April 2018 – Virginia

- **Medium Capacity Scales**
  - May 2017 CWMA Annual Meeting

General

- **Measurement Systems for Legal Metrology – New Webinar**
  - Intro to measurement system basics, including the use of unit symbols, prefixes, and transitioning within/between measurement systems. Ideal for those unfamiliar with performing unit conversion calculations.

A complete list of upcoming OWM training events is available on the calendar of events on the OWM website at: **www.nist.gov/pml/weights-and-measures/about-owm/calendar-events.**

Mrs. Butcher noted the NIST Office of Weights and Measures (OWM) has been asked by multiple Regional Weights and Measures Associations (Regionals) to offer training seminars in conjunction with their annual meetings. OWM welcomes and appreciates the opportunity to offer training in this venue and reach multiple jurisdictions at once. To assist in planning for training in 2019 and in developing materials for future courses, OWM has asked for feedback from each Regional. Drawing from its full list of training topics, OWM identified topics on which OWM is prepared to offer training at the 2019 Regional meetings (and would lend themselves to the time constraints of a Regional) as shown below and distributed this list to each Region’s main point of contact at the beginning of June.

Packaging and Labeling and Price Verification:
Price Verification Test Procedures (1-2 days)
Uniform Packaging & Labeling Regulation (4 days)
Uniform Packaging & Labeling Regulation – Overview (1 day)
NIST Handbook 133 – Chapters 1 and 2, Gravimetric Testing (4 days)
NIST Handbook 133 – Chapters 1 and 2, Gravimetric Testing – Overview (1 day)
Devices:
Livestock and Animal Scales (3 days)
Medium-Capacity Scales (3 days)
Retail Computing Scales (3 days)
Retail Motor-Fuel Dispensers Short Course (3-.5 days)
Selection and Testing of Reference Scales (1 day)
Vehicle and Axle-Load Scales (3 days)
Vehicle-Tank Meters (3 days)

OWM hopes to identify one or two training topics that would be of interest to multiple Regionals to help maximize the use of its resources in preparing for the training. OWM is also seeking feedback from the Regionals and others on ideas for ***future*** topics that may be needed to assist jurisdictions with addressing changes in technology and marketplace practices.

OWM discussed these training options with the regions during their scheduled meetings Wednesday morning at the Annual Meeting. Mrs. Butcher also noted OWM would like to use a similar approach of obtaining regional input each year to help OWM better meet any requests for training by OWM that the regions might have.

Regional Association Comments:

The WWMA PDC Committee heard the following comments during its 2017 Annual Meeting Open Hearings and recommends maintaining this item as an Information item on the NCWM PDC Agenda:

- Is there a way to provide more technical training to industry representatives? Several commenters said this would be valuable for them to participate and they would understand the regulator's perspective more.

- Another commenter stated that it is difficult for businesses to send service agents to trainings that are a week long; it is expensive to have them in training and not working.

- Industry has been participating with some training events with successful results.

- The NIST website is a valuable resource to check for upcoming courses and training dates.

- A suggestion was made that training be offered concurrently with regional conferences, and that planning training twice a year (spring and fall) where one training is independent of a conference.

At its fall 2017 meetings, the SWMA heard no comments on this item and recommends maintaining this item as an Information Item on the NCWM PDC Agenda.

At NEWMA's spring 2018 Annual Meeting, the PDC NIST Technical Advisor, Mrs. Tina Butcher, provided an update on all the training NIST has completed in 2017 and year-to-date 2018 as well as upcoming training opportunities. The Committee appreciates and supports ongoing assistance provided by NIST technical advisers. NEWMA recommended maintaining this item as an Information Item on the Committee's agenda.

At CWMA's spring 2018 Annual Meeting, a suggestion was made that NCWM take over the NIST training to assist with the NIST budget constraints. Comment was made that it may take up to 2 years to get NIST scheduled to provide training. Comment was made that members get hung up on the train the trainer program and that it is everyone's responsibility to train each other. Comment was made that if NIST is unavailable to provide the training and certificate that receiving the training is more than important than to receive a certificate. The CWMA recommended maintaining this item as an Information Item on the Committee's agenda.

EDU-3 I Instructor Improvement

NIST OWM has provided legal metrology training for weights and measures jurisdictions and industry for many years but does not have the resources to respond to the numerous training requests it receives. OWM has long recognized that there are many individuals with extensive legal metrology experience who have the skills needed to provide this type of training. OWM continues to draw from this pool to develop trainers who can present schools with NIST, thus leveraging NIST resources; providing more timely classes; and providing a way to more broadly share the valuable expertise these individuals possess.

Several years ago, OWM renewed its efforts to develop trainers by providing a grant to the NCWM which is intended to pay travel costs of individuals to travel within their regions to conduct training and to participate in NIST training for trainers. This partnership has enabled NIST to bring in candidates for NIST-sponsored training such as "train the trainer" classes and to participate in NIST technical training schools. Through an application process, in collaboration with weights and measures directors and nominated training candidates, NIST has identified a group of people who are now working with NIST to develop the knowledge, skills, and abilities to work with NIST staff in presenting technical training schools. Many candidates in the NIST Trainer Program have already served as co-instructors for NIST technical training schools and have done an excellent job. OWM sincerely appreciates the willingness of those trainers and their directors who have supported their participation to devote time to making these seminars successful.

NIST training seminars on field inspection topics are held a limited number of times each year. This poses a challenge in sustaining regular interaction and involvement of NIST trainer candidates. NIST does not have the resources to develop and sustain the development of all the trainers it has invited to participate in the NIST trainer program activities and events held over the past several years; however, even if a candidate is not designated to participate as an instructor in a NIST seminar, the candidate and his or her jurisdictions can benefit from the experience and the candidate can still provide valuable training in the jurisdiction and region.

A list of all people who have attended a NIST "Train the Trainer" class or associated event has been posted on the NCWM website. Many people on this list have attended NIST "Train the Trainer" events and workshops but have not served as co-instructors for NIST classes and, in some cases, have not even attended NIST technical training schools in the areas in which they are interested in serving as trainers. Conversely, there are people on this list who have attended the workshops and NIST technical training seminars and have also served as co-instructors in NIST training seminars. Because of the variations in experience levels of individuals on this list and because OWM has not authorized anyone (external to NIST) to independently present "NIST" classes and is still refining the program infrastructure, confusion has arisen in the weights and measures community regarding classes these individuals may present on their own. NIST and NICM are considering how to best depict these listings to reflect the status of the grainers listed such that confusion can be avoided in the future.

OWM appreciates the strong support of the NCWM; the PDC; and the volunteer trainers and their directors in continuing to develop the NIST Trainer Program. OWM will continue to provide the Committee with updates on its progress as well as continue to collaborate with and support the Committee in its work.

The Committee continues to hear comments from States expressing appreciation for the NCWM Professional Certification Program and the NIST Training Program. The Committee also heard favorable comments about the training materials and tools provided by NIST, including a video on testing retail motor-fuel dispensers (RMFDs). As noted in Item 410-2, the NIST video is divided into segments focusing on specific parts of the RMFD test procedure that can be used to supplement and enhance instructor-led training. The video can be accessed through OWM's home page or by going directly to the following link: **www.nist.gov/pml/wmd/lmdg/training-materials.cfm**

The Committee has reiterated multiple times in the past that the responsibility for training employees' rests with individual organizations (weights and measures jurisdictions and industry alike). While NIST and other training providers offer excellent sources of training and training materials, organizations must develop and manage their own training programs, including developing trainers; establishing individual development plans for employees; and identifying strategies for continually assessing and responding to training needs. The Committee recognizes NIST OWM cannot possibly train all the weights and measures inspectors in the country. State and municipal jurisdictions have ultimate responsibility for training and qualifying their personnel. To fulfill this responsibility, jurisdictions should be making individual plans to maintain or bolster their training efforts. NIST OWM should be viewed as one vital resource to support that effort. The Professional Development Committee is another resource. The Committee has created and posted on its website, the "Body of Knowledge" to establish uniform learning objectives for weights and measures professionals. In addition, the Committee has posted a Model Field Training Program document on its website. This program outlines methods to evaluate and document training and offers guidance on training new inspectors and taking steps to ensure their ongoing development.

These initiatives require competent and qualified trainers and a centralized management plan within the jurisdiction. The Committee is continuing to work, in partnership with NIST OWM, to identify the basic competencies of those trainers and training managers so that jurisdictions can find the right people to manage and deliver training internally. It's not enough just to be technically competent in a subject area to be a good trainer or to effectively manage a training program. It takes other tools, such as:

- ability to assess employee competence and training needs,
- ability to create learning materials from technicalmaterial,
- ability to use adult learning techniques adapted to individual and group needs,
- ability to plan training activities and find appropriate training venues,
- ability to find creative ways to deliver training with tight budgets,and
- ability to adapt the overall training program to best serve jurisdiction goals

In 2015 OWM developed a NIST Instructor Training Program Instructor Competency Assessment and Feedback Instrument that can be used as a self-assessment tool by instructors and assist them in identifying and setting goals to strengthen and develop their skills as trainers. Included in this assessment tool is a broad list of competencies for trainers based on a model developed by the U.S. Department of Education's "Instructor Competencies Assessment Instrument" through Pro-Net 2000 (contact Mrs. Tina Butcher, NIST OWM for additional details). For the purposes of serving as a NIST OWM trainer, only a subset of these competencies may be necessary, although some trainers participating in the NIST Trainer Program may be required to master more of them to meet broader training responsibilities within their own agencies. See past Committee reports for additional background.

As previously reported, NIST OWM is authorized by IACET to issue "Continuing Education Units" for certain training seminars and, as part of this authorization, there are certain provisions that an instructor must follow to meet these requirements. NIST Certificates and the accompanying CEUs can only be issued if these criteria are met; this includes ensuring that the material is presented consistent with the learning objectives and interpretations specified by NIST OWM and in the same time frame. OWM staff trainers have completed IACET training courses and are familiar with the procedures that OWM has implemented to ensure compliance with IACET-related requirements for NIST training courses. External trainers in the NIST Trainer Program must also understand these provisions. OWM has presented several short webinars to help its external trainers obtain the necessary training and will continue to seek opportunities to provide this training to those who have not yet completed it.

At the 2016 Annual Meeting, Mrs. Butcher reported NIST made a $100,000 grant to NCWM to support travel and training events for the NIST Trainer program. OWM continues to work on formalizing the NIST Trainer Program.

At the 2017 Annual Meeting, Mrs. Butcher updated the Committee on progress on "Instructor Improvement" in the NIST Trainer Program. She noted that OWM is continuing to work on the infrastructure of the program, including documenting:

- Procedures for Selection, Evaluation, and Feedback to Instructors
- Instrument - Instructor Competency Assessment and Feedback – Overall
  - Based on US Dept. of Education model for overall development
- Instrument - Instructor Competency Assessment - specific courses
- Criteria for Developing Participants in NIST Instructor Training Program and Use of the NIST-NCWM Training Grant
- Instructor Agreement

OWM shared this information with NCWM Board of Directors at their May 2017 meeting as a follow-up to discussions and a request made at the Board's January 2017 meeting. Mrs. Butcher noted OWM is beginning to implement these tools with its external trainers and OWM has made continual adjustments to the assessment documents based on experience. For example, the instrument which is used to provide an overall assessment of a trainer's professional competencies can be used to help a trainer identify personal goals for improving their competencies as a trainer, including both those that NIST would require of its trainers and those that might be required of them in their own jurisdiction. However, the instrument proved overly complex for an individual learning event. Consequently, Georgia Harris (OWM) developed a scaled down version of the instrument that was tailored more toward individual learning events, but that still linked back to the overall competencies. This instrument has been used in at least two classes and a revised version will be used in courses coming up in fall 2017.

Mrs. Butcher reported that 10 of OWM's 44 training sessions in 2016 included non-NIST instructors assisting in the NIST OWM classes. Travel for external trainers serving as co-instructors in these classes is funded using travel from a grant provided by NIST to NCWM. She expressed appreciation to NCWM for its continued assistance in administering the grant and helping make the process of getting the trainers to these courses as smooth as possible.

Mrs. Butcher also reported that several instructor training webinars had been offered to external trainers, including webinars on Blooms Taxonomy; learning objectives; and the ADDIE model. She noted that one of NIST's external trainers audited a "Train the Trainer" course offered by the American Management Association and OWM is considering if this might be a course that could be used by prospective NIST instructors in their own personal development as trainers. Mrs. Butcher noted that OWM is continuing to involve external trainers in its training efforts and has been increasing their responsibilities in these seminars. She emphasized the significant impact that the external trainers have had on the success of the NIST courses and expressed appreciation for the trainers who give of their time and expertise and the directors who allow the trainers time away to assist with these courses.

Prior to the 2018 NCWM Interim Meeting, Mrs. Butcher provided a written update to the Committee on progress in the area of instructor training; this information was included in the Committee's slide presentation during its Open Hearings. NIST OWM has begun to use the new Instructor Competency Core Assessment Instrument referenced at the 2017 NCWM Annual Meeting in assessing NIST trainers and external trainers for individual learning events. OWM has only been able to devote a limited amount of time on program development since the 2017 Annual Meeting. However, OWM continues to discuss how to best proceed with the overall program and is looking at funding in light of its current budget situation. OWM cannot replenish the NCWM-NIST grant at this point. OWM plans to maintain some external trainer participation through "invitational travel" using OWM's staff travel budget, though that budget is rather limited. OWM reiterated its appreciation of these trainers' contributions to NIST training seminars and their directors' support of their continued participation.

The Committee understands there are many pieces to any training program. The PDC and NIST Trainer Program are important, but the primary responsibility for training resides with your own organization. Each organization needs strong leadership to:

- Conduct needs assessments

- Set goals and initiatives
- Define metrics that permit you to verify goals are met
- Monitor employees' performance
- Ensure content of training engages trainees

All of this requires buy-in from upper management which drives home the importance of a training program, assists in accountability, and verifies appropriate expectations. Employees must understand the "why" behind training and be given opportunities to apply the new knowledge. Studies show that trainees forget all in less than a week if the new knowledge is not put into practice.

At the 2018 NCWM Annual Meeting, Ms. Tina Butcher (NIST/OWM) announced NIST is unable to renew the training grant at this time, due to budget limitations. This will curtail the use of state trainers in some of the NIST training classes. Where they may have used multiple state trainers to assist in a class under the grant, it may be reduced to one external trainer per class and OWM will pay for those travel costs out of the OWM travel budget.

NIST Training Using External Trainers or Teaching Assistants
August 2017 to July 2018

Course	Date	Location	Students Total	NIST Instructor	T3 or teaching Assistant	Funding Source
NIST HB 130 Uniform Packaging & Labeling – 4-day	9/25/2017	MN	11	Sefcik	Rachelle Miller	NCWM grant
NIST Handbook 130 Price Verification	10/10/2017	AR	14	Sefcik	Doug Rudy	NCWM grant
NIST HB 133 - Checking Net Contents - Basic	10/23/2017	CA	19	Sefcik	Kathy De Contreras	NCWM grant
RMFD Training – 3-day	10/23/2017	PA	19	T. Butcher	Scott Simmons	NCWM grant
Balance & Scale Calibration & Uncertainties*	1/9/2018	NIST	9	Miller	Daniel Walker	NIST
NIST HB 133 Chapter 3 Volumetric Meas.	2/5/2018	CA	12	Sefcik	Annie Tsou	NCWM grant
Fundamentals of Metrology*	2/5/2018	NIST	12	Harris	Lina Ng	NIST
NIST HB 130 Uniform Packaging & Labeling – 4-day	3/12/2018	CA	26	Sefcik	Kathy de Contreras	NCWM grant
NIST HB 133 - Checking Net Contents - Basic	3/26/2018	MO	19	Sefcik	Steve Galvin	NCWM grant
Livestock and Animal scales	4/10/2018	VA	14	Barton	Greg Gholston	NCWM grant
NIST HB 133 - Checking Net Contents - Basic	4/16/2018	AL	16	Sefcik	Michael Barrett	NCWM grant
LPG Training	5/14/2018	CA	24	T. Butcher	Scott Simmons	NCWM grant
Mass Metrology Seminar*	5/14/2018	NIST	11	Harris	Lisa Corn	NIST
LPG Training	6/10/2018	OH	21	T. Butcher	Mike McGoff	NCWM grant

NIST Training Using External Trainers or Teaching Assistants August 2017 to July 2018						
Course	**Date**	**Location**	**Students Total**	**NIST Instructor**	**T3 or teaching Assistant**	**Funding Source**
Fundamentals of Metrology*	6/11/2018	NIST	11	Harris	Danial Walker	NIST
		Total Students	**238**			
***Lab Metrology Teaching Assistants paid from class budget rather than NCWM grant.**						

Ms. Julie Quinn (Michigan) asked a question about the real value of making CEU's a requirement in training. She expressed the idea that inspectors were eager to take advantage of any available training which provides real value. A few significant issues facing states are the ability to qualify for higher level courses and proving prerequisites have been met. The Committee believes the basic competency exams (to be released shortly) may serve a purpose in this regard. Candidates may also take the on-line NIST HB44 offered on the OWM website. There is a concern over whether prerequisites would be realistically attainable in all cases.

Mr. Jerry Buendel (Washington) expressed appreciation to the AMC for continued financial support for training. The Committee echoes that sentiment.

Regional Association Comments:

The WWMA PDC Committee heard the following comments during its 2017 Annual Meeting Open Hearings and recommends maintaining this item as an Information item on the NCWM PDC Agenda:

- Mr. Doug Olson (NIST OWM) provided an update on the NIST Train the Trainer Program. The Train the Trainer Program has produced trainers which assist NIST OWM staff with their workload but reminded attendees that persons who have successfully completed the Train the Trainer program are not NIST certified. Students completing training from persons other than NIST OWM staff are not eligible for continuing education units (CEU). OWM staff have been meeting monthly to discuss and review the goals of this program.

- Mrs. Lisa Warfield (NIST OWM) stated that there is a current need for persons to assist NIST staff with Handbook 133 courses. Persons interested in assisting should fill out the Train the Trainer application and submit it to NIST OWM.

- The short two-hour Metrology webinars offer timely training on a variety of topics and have been well-received by participants. The WWMA PDC Committee recommends NIST OWM and the NCWM Toolkit Task Force consider expanding this format for other suitable weights and measures topics.

At its fall 2017 meeting, the SWMA heard no comments on this item and recommends maintaining this item as an Information Item on the NCWM PDC Agenda.

At NEWMA's spring 2018 Annual Meeting, the PDC NIST Technical Advisor, Mrs. Tina Butcher, commented that in the past NIST has been able to issue a grant to the NCWM for Instructor Training which has been very successful. The NIST budget has not yet been completed and, therefore, it is uncertain if NIST will be able to provide this grant in the future.

At CWMA's spring 2018 Annual Meeting, comment was made that persons listed on the NIST website as having completed the Train the Trainer program are not allowed to train NIST courses on their own. This continues to prove difficult for the regions to receive NIST training. Comment was made even though NIST training is limited they are increasing the number of trainings in conjunction with regional meetings. Comment was made by NIST that a significant number of trainings took place last year and when surveyed many states were unable to implement the training due to budget constraints.

EDU-4 I Recommended Topics for Conference Training

The Board of Directors has charged the Committee with recommending appropriate topics for the technical sessions at future annual meetings. The Board of Directors asks the PDC to review and prioritize possible presentation topics and to submit those to the NCWM Chairman. The Chairman will coordinate with NCWM staff to secure presenters.

The following is a list of technical presentations made at the NCWM since 2016. Presentations given since 2010 are available at **www.ncwm.net/meetings/annual/archive**.

- Planning and Coordinating a National Market Place Survey (Ms. Rachelle Miller, WI 2017);
- The Life Cycle of Petroleum from Well to Retail (Mr. Prentiss Searles, API 2017);
- The United States Mint at Denver – Gold, Coins and Embezzlement (Mr. Thomas Fesing, 2016)
- Understanding Transportation Network Systems (Ms. Andrea Ambrose Lobato, Lyft and Mr. Bob O'Leary, Uber 2016)
- Regulatory Consideration for Legalized Marijuana (Ms. Julie Quinn (Minnesota) and Mr. Nick Brechun (Colorado) 2016.

The Committee appreciates the input and ideas that it has received regarding suggested training topics. Mr. Tim Chesser (Arkansas) asked the Committee to consider recommending non-technical training such as public speaking, effective writing for managers or for investigations. Mr. Jerry Buendel (Washington) asked the Committee to consider offering concurrent sessions to allow more topics to be presented. Mr. Allan Morrison (California) suggested training for fuel quality laboratory managers. Mr. Marco Mares (San Diego, California) suggested training for managers on how to do outreach to stakeholders on program initiatives like fee increases.

Based on the comments received during its open hearings, comments from the fall 2017 regional association meetings, past suggestions, and discussions during its Interim Meeting work sessions, the Committee proposes the BOD consider offering technical presentations on the following topics:

- Verifying Compliance of Software-Controlled Weighing and Measuring Systems
    - This might include the verification of software versions, security, and other metrologically significant issues
- GPS-Based Measuring Systems Used in Applications Other Than Passenger Transport
- Vehicle-Tank Metering Systems "Flush Systems"
- Cannabis and W&M associated issues
- Building a culture of Safety and how OSHA can help

Regional Association Comments:

At its 2017 Annual Meeting, the WWMA heard the following suggested training topics:

- Implementation of a Tentative Code and Steps to Transition to a Permanent Code

- Scan and Go Technology
- Emerging Technologies (e.g., vending machines)
- Diesel Exhaust Fluid: Equipment selection and inspection methods
- Convert the NIST Handbook 44 Self Study Course into a classroom course offered at regional and/or NCWM meetings
- Weights and Measures-Related Emergency Response Training to Disaster Events (e.g., hurricanes or earthquakes which might disrupt fuel deliveries or result in retail fuel quality issues)

The WWMA recommended this item be retained as an Information Item on the NCWM PDC's Agenda.

At its 2017 Annual Meeting, the SWMA received no comments on this item and recommended it be retained as an Information Item on the NCWM PDC's Agenda.

At its 2017 Interim Meeting, the CWMA recommended retaining this item as an Information Item on the NCWM PDC's Agenda. Mr. Loren Minnich (Kansas) requested training on Class II scales. The CWMA also heard comments that more officials need education on how to test these scales. A request was made for additional training on skimmers and shimmers as well. A South Dakota official asked for a presentation on the new digital density meter.

At its 2017 Interim Meeting, NEWMA heard comments on the importance of how the issue of cannabis will impact the Weights & Measures community. NEWMA supports education in the form of regional and national presentations as well as formalized guidelines and training presented by the NCWM as well as NIST. NEWMA recommends maintaining this item as an Information Item on the NCWM PDC's agenda.

This year's training event is a visit of the Magellan Midstream Partners pipeline terminal, which includes a tour, as well as a classroom session explaining how pipelines work. The Committee is pleased with the high level of participation.

PMT – PROGRAM MANAGEMENT

PMT-1 I Safety Awareness

One of the goals of the PDC is to educate jurisdictions on safety issues and to provide resources to help them implement effective safety and health management programs. The Committee intends to use the NCWM website (**www.ncwm.net/resource/safety**) as a place for states to share information and resources to help them address each of the major steps in creating and maintaining an effective safety program.

In July 2017, the Board of Directors created the Safety Task Group to create a safety tool kit to help weights and measures organizations create or improve their own safety programs. The goal is to help every organization:

Create a "culture of safety" where accidents and injuries are just not acceptable. A culture where safety is everyone's personal responsibility; where everyone is given the training and tools they need to work safely; and where everyone is empowered to stop work if hazardous situations arise and to control safety hazards before work continues.

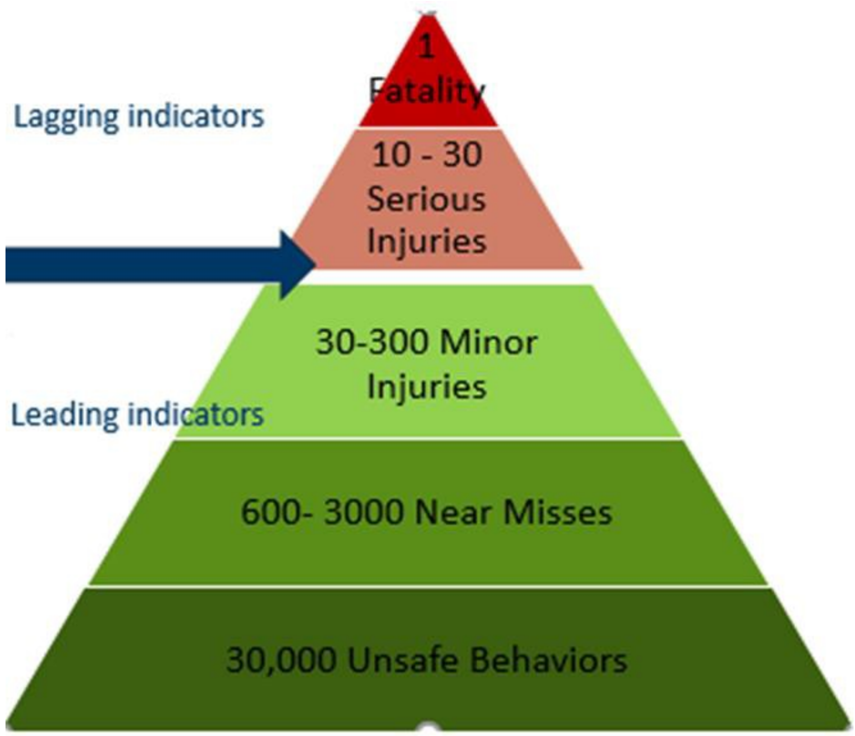
The task group is utilizing the recently published draft of OSHA's Safety and Health Management Program Guidelines (**www.osha.gov/shpmguidelines/SHPM_guidelines.pdf**) to organize its work. This 44-page document is written in plain language and is aimed at helping small organizations establish, maintain, and improve safety and health management programs.

Topics covered to date:

- Economic case for safety

- Direct costs of poor safety program
  - Medical and WC costs of injury
  - Loss of income produced by injured employee
  - Cost of temporary replacement
  - Higher insurance rates
  - Loss of ability to access some sites because of poor Employee Modification Rate (EMR)
    - Indirect costs of poor safety program
      - Loss of overall productivity/low morale
      - Loss of reputation
      - Stress for team members who pick up the work of injured employees
      - Inability to follow up on rejections
  - Management challenges
    - Lack of knowledge/training
      - Technical experts without safety management training
      - Little experience with job safety analysis and risk management assessment grids
    - Lack of resources
      - Fixed budgets and restrictions on how money can be spent
      - No dedicated safety professionals
      - Lack of commitment from higher-ups (That's- how-we-have-always-done-it mentality)
      - Difficulty taking employees away from "real' work for training
    - Worker participation challenges
      - Employees not trained to recognize hazards
      - Employees may not feel safe to report unsafe conditions without retaliation
      - Employees may not feel empowered to stop work until an unsafe condition is corrected
      - Management may not have followed through when past safety hazards were reported
      - Some employees may feel like safety programs are a waste of time and slow them down in their work
    - Hazard identification and assessment

- It is important to track leading and lagging indicators
- Leading
  - Near-misses
  - Property damage
  - Observations of unsafe conditions or behavior
  - Information from pre-task analysis and job hazard analysis
- Lagging
  - Serious injuries
  - Fatalities



- Hazard prevention and control
  - Hierarchy of Controls:
    - Most Effective: Elimination; Substitution, Engineering Controls,
    - Least Effective: PPE, Policies,
    - Could be effective: Training, behavior modification
      - Example - GPS on trucks can provide strong behavior modification; game-ifying driving
- Challenges:

- WM controls most often PPE and Policies
- Inspectors/service agents working without direct supervision
- Clients may be willing to tolerate conditions we find unacceptable
- Inspectors/service agents don't feel empowered to stop work and insist on safety changes in field conditions

Topics to be covered in upcoming meetings:

- Education and training
- Program evaluation and improvement
- Multiemployer worksites

The safety task group is also working to improve the annual safety survey.

For two years in a row, the survey has shown that the top three causes of lost or restricted time were:

- **Lifting/twisting/bending 54.5% – 6 incidents in 2016**
  - Soft tissue injuries (3), Back or neck injuries (3)
  - Lost days – 60+ days (2), 21 – 60 days (2), 0–5 days (2)
  - Restricted days – 60+ days (1), 16–20 days (1), 6–10 days (1), 0–5 days (3)
- **Slips/trips/falls 18.2% - 2 incidents in 2016**
  - Soft tissue injuries (1), broken bones (1) 0 Lost days – 21-60 days (1), 6–10 (1)
  - Restricted days – 16 – 20 days (1), 6 –10 days (1)
- **Vehicle accidents 18.2%, 2 incidents in 2016**
  - Soft tissue injuries (2)
  - Lost days 0–5 (2)
  - Restricted days – none

In addition to asking about injuries which resulted in Days Away and Restricted Time (DART) injuries, the task group is going to add questions about leading indicators such as:

- Incidents with property damage/reported minor injuries
  - To your vehicles or equipment
  - To others' property
- Written reports of incidents that did not result in a DART injury (accident report/first report of injury/incident investigation/near-miss report/etc.)

The task group is working with the NCWM BOD to determine whether the NCWM may wish to apply for an OSHA Susan Harwood Training Grant to develop safety training. To help the BOD determine what training would be most beneficial to the greatest number of members, the task group intends to add additional questions to the safety survey about what training agencies are currently providing, and what training they need most.

The Committee expresses appreciation to the members of the Safety Task Group for their willingness to volunteer for this important work.

Safety Task Group		
Office	**Name**	**Affiliation**
Chair	Julie Quinn	Minnesota
Public Sector Member	Jason Flint	New Jersey
Public Sector Member	Georgia Harris/Doug Olson	NIST, Office of Weights and Measures
Public Sector Member	Elizabeth Koncki	Maryland
Public Sector Member	Matt Maiten	Santa Barbara County, California
Public Sector Member	Brenda Sharkey	South Dakota
Public Sector Member	Mike Sikula	New York
Private Sector Member	Tisha Arriaga/Jeff Griffith	Marathon Petroleum, LLC
Private Sector Member	Bill Callaway	Crompco
Private Sector Member	Remy Cano	Northwest Tank and Environmental Services, Inc.
Private Sector Member	Brad Fryburger	Rinstrum, Inc.
Private Sector Member	Robert LaGasse	Mulch and Soil Council
Private Sector Member	John Lawn	Rinstrum, Inc.
Private Sector Member	Richard Shipman	Rice Lake Weighing Systems, Inc.

Currently the NCWM safety page houses the list of regional safety liaisons and an archive of past safety articles.

Regional Safety Liaisons:

Central Weights and Measures Association (CWMA):
Ms. Julie Quinn, Minnesota Weights and Measures Division

Northeastern Weights and Measures Association (NEWMA):
Mr. Michael Sikula, New York Bureau of Weights and Measures

Southern Weights and Measures Association (SWMA):
Mrs. Elizabeth Koncki, Maryland Department of Agriculture

Western Weights and Measures Association (WWMA):
Mr. Brett Gurney, Utah Department of Agriculture and Food

Each region is responsible for providing a safety article for the NCWM newsletter according to the following schedule:

Safety Article Schedule		
Issue 1 February 2018	WWMA	January 15, 2018
Issue 2 May 2018	CWMA	April 15, 2018
Issue 3 September 2018	NEWMA	August 15, 2018
Issue 1 February 2019	SWMA	January 15, 2018
Issue 2 May 2019	WWMA	April 15, 2019

Thanks to the following individuals for their contributions since the 2016 annual meeting:

- Brett Gurney, Utah *"Safety in Standard Operating Procedures,"* issue 3, 2016
- Julie Quinn, Minnesota *"OSHA's Powered Industrial Truck Standard,"* issue 1, 2017
- Mike Sikula, New York "*Working Around Stinging Insects*," issue 2, 2017

Regional Association Comments:

At its 2017 Annual Meeting, the WWMA received one comment from Kristin Macey (Calironia), who stated that jurisdictions may consider using OSHA on-site consultations when expanding their inspection programs into areas with potential safety concerns (e.g., electric vehicle fueling systems). The WWMA recommended this item be retained as an Information Item on the NCWM PDC's Agenda.

At its 2017 Annual Meeting, the SWMA received no comments on this item and recommended it be retained as an Information Item on the NCWM PDC's Agenda.

At its 2017 Interim Meeting, the CWMA recommended retaining this item as an Information Item on the NCWM PDC's Agenda. The CWMA requested that its member states keep a log for reporting employee accidents, lost days from work, and near misses on the job. When the safety survey is received, please fill it out in a timely manner and send it back.

At its 2017 Interim Meeting, NEWMA supported active participation in the safety survey. NEWMA supports jurisdictions actively reviewing and supporting their safety program. The NEWMA safety liaison asked that in addition to safety incidences the safety Task Group look for safety improvements from industry and share that information in the regional and national meetings. NEWMA supported this recommendation and recommended that this item be retained as an Information Item on the NCWM PDC's Agenda.

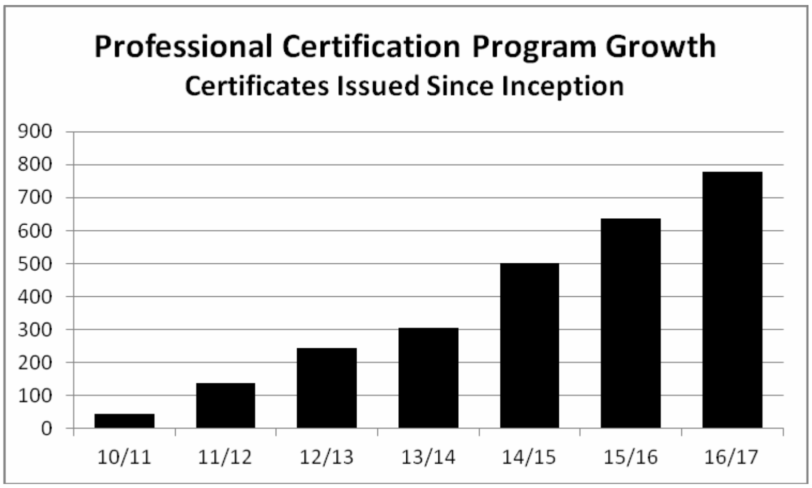
Ms. Lori Jacobson, South Dakota | Committee
Chair Mr. Gene Robertson, Mississippi | Member
Mr. Marc Paquette, Vermont | Member
Mr. Marco Mares, San Diego County, California |
Member Ms. Jean Kliethermes, Missouri | Member
Mr. Richard Shipman, Rice Lake Weighing Systems | Associate Membership
Representative Ms. Julie Quinn, Minnesota | Safety Liaison
Ms. Tina Butcher | NIST Liaison
Mr. Ross Andersen | Certification Coordinator

Professional Development Committee

Appendix A

Additional Statistics on Professional Certification

The Professional Certification Program continues to grow. The graph below shows the steady growth in certificates issued as of September 30, 2017. The Committee encourages widespread use of the program as indicated in the body of the Report (see item EDU-1).

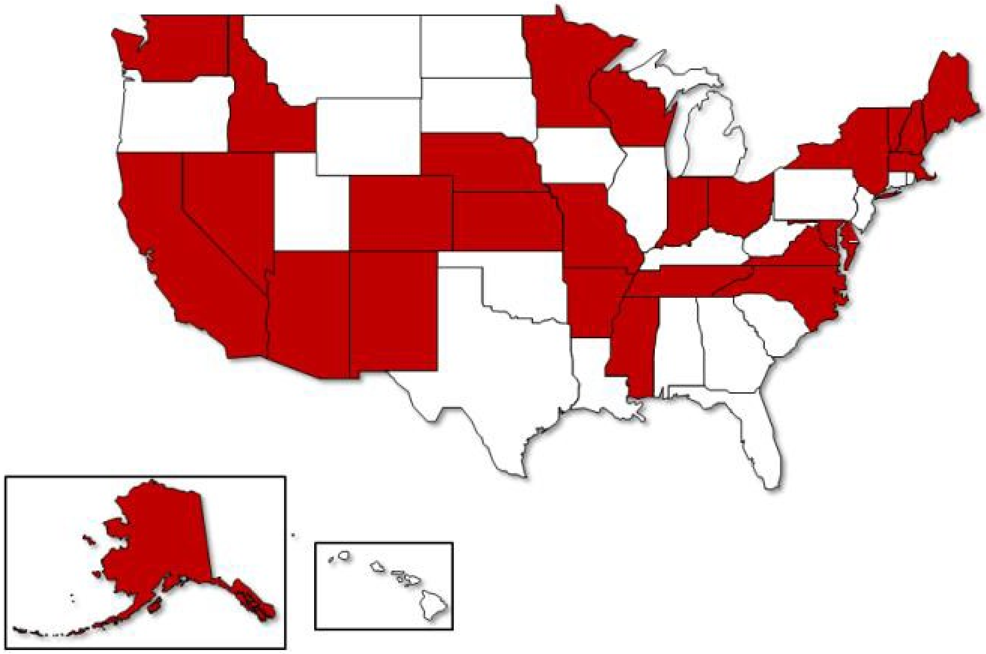


The table below shows all certificates issued since inception of the program by state. Item EDU-1 only showed the most active states. Note the state may have only state inspectors or may be a mix of state and municipal officials. Private industry certificate holders are listed separately in this table.

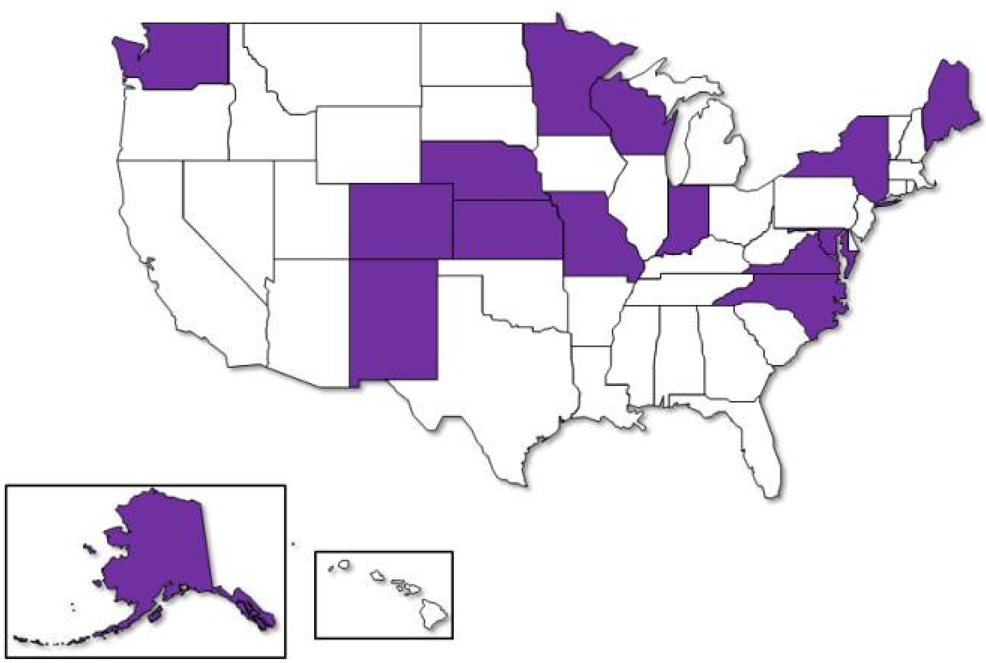
State	Certificates	State	Certificates
Missouri	102	Massachusetts	12
Minnesota	92	Ohio	12
Maryland	70	Private	11
Washington	48	Colorado	10
Mississippi	45	Idaho	8
Virginia	41	Arizona	5
Kansas	36	Pennsylvania	5
Wisconsin	36	Vermont	5
Nebraska	33	Wyoming	5
California	30	Delaware	3
Alaska	25	Arkansas	2
North Carolina	25	Michigan	2
New Mexico	23	Oregon	2
Nevada	22	Tennessee	2
New York	19	Louisiana	1
Maine	16	Montana	1
Connecticut	15	New Hampshire	1
Indiana	12	West Virginia	1

The maps below show the states with individuals presently holding professional certification in each subject area by state. Note: these graphics include private industry certificate holders within the state based on the candidates mailing address. The Committee would like to see all states participating in the future.

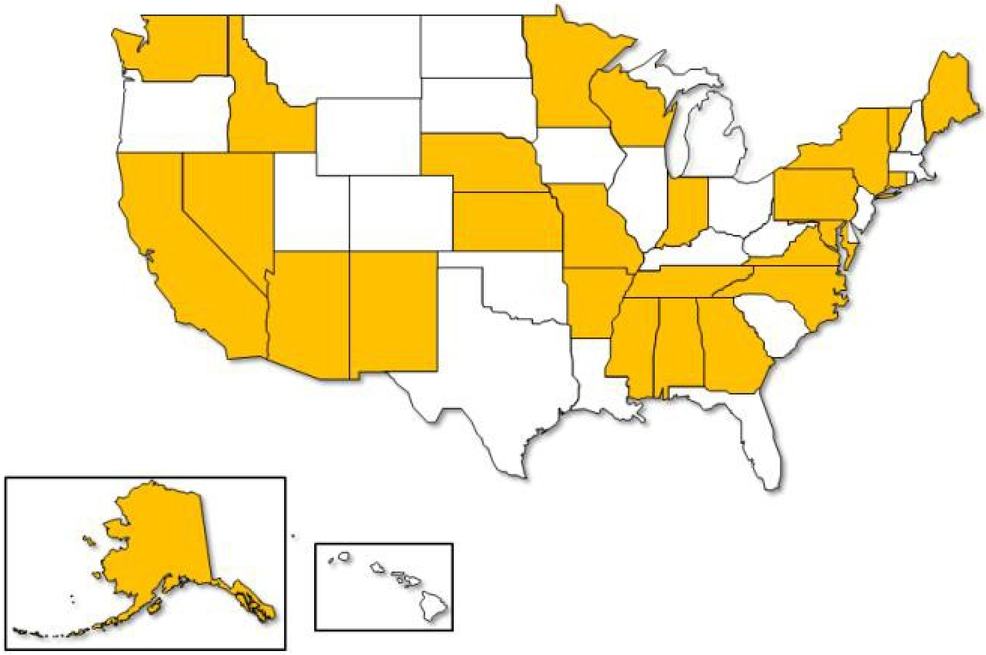
Distribution of Areas of Certification: Retail Motor Fuel Dispensing Systems
Updated: September 2017



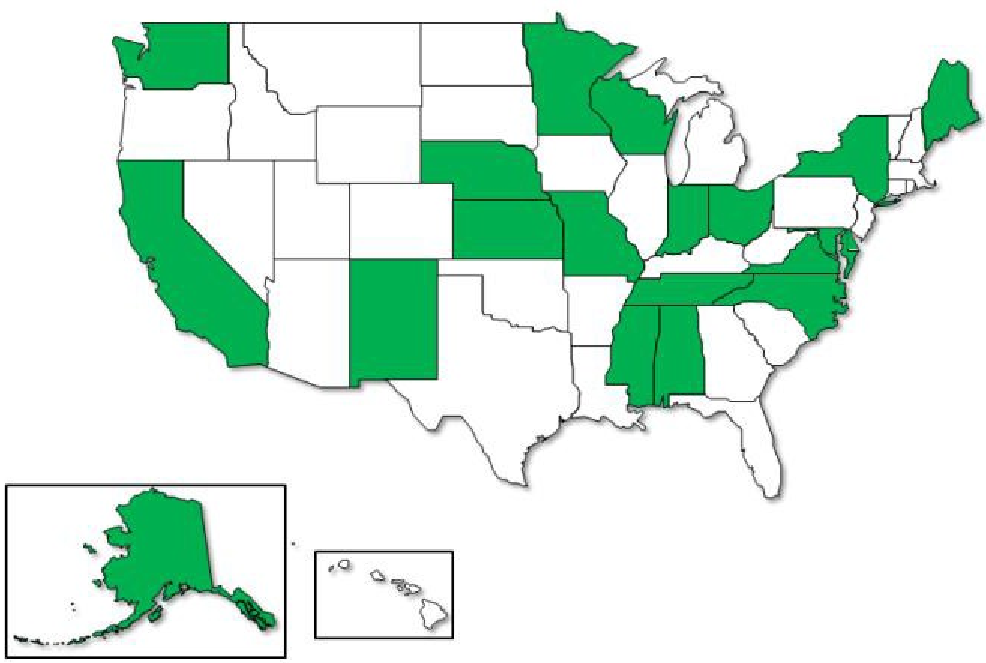
Distribution of Areas of Certification: Vehicle Tank Meters
Updated: September 2017



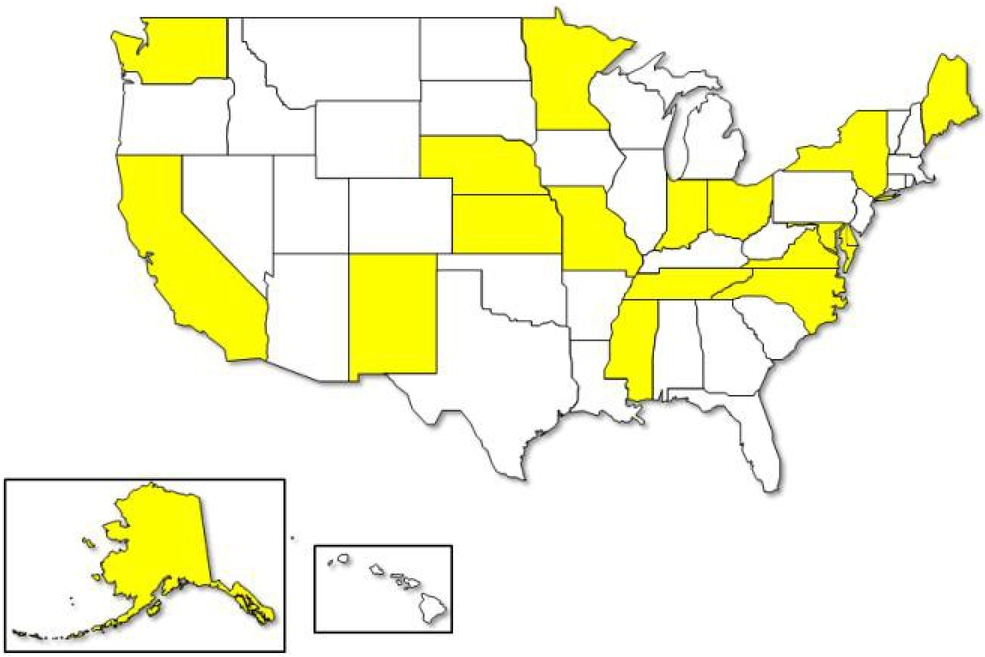
Distribution of Areas of Certification: Small Capacity Weighing Systems Class III
Updated: September 2017



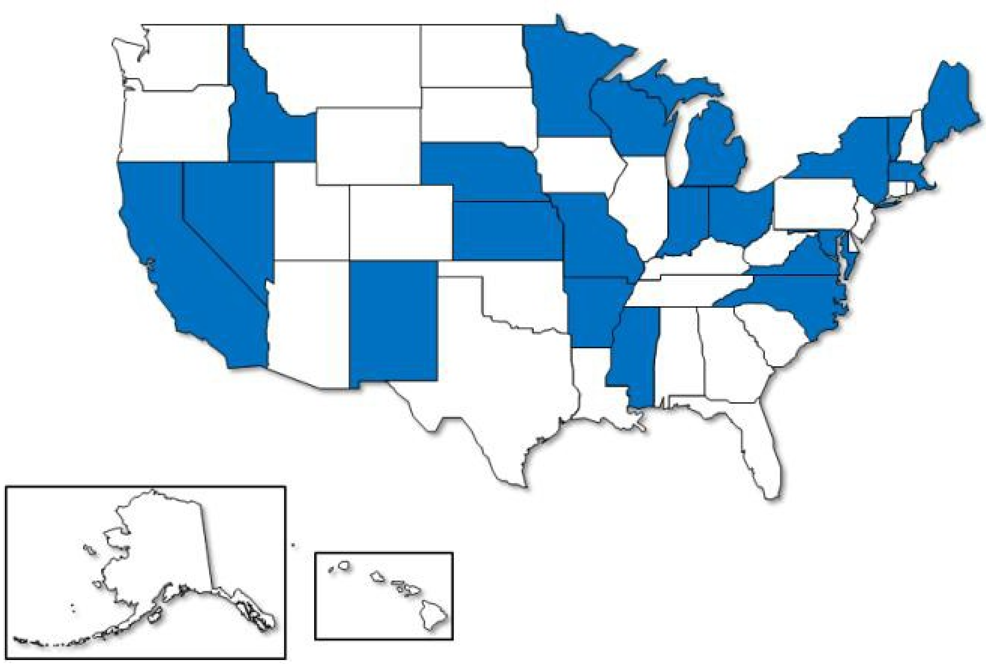
Distribution of Areas of Certification: Medium Capacity Weighing
Updated: September 2017



Distribution of Areas of Certification: Large Capacity Scales
Updated: September 2017



Distribution of Areas of Certification: Package Checking Basic
Updated: September 2017



National Type Evaluation Program (NTEP)
2018 Final Report

Ms. Kristin Macey, Committee Chair
California

INTRODUCTION

This is the report of the NTEP Committee (hereinafter referred to as the "Committee") for the 103rd Annual Meeting of the National Conference on Weights and Measures (NCWM). This report is based on the Interim Report offered in the NCWM Publication 16, testimony heard at public hearings, comments received from the regional weights and measures associations and other parties, the addendum sheets issued at the Annual Meeting, and actions taken by the membership at the voting session of the Annual Meeting. The informational items presented below were adopted as presented when the Committee's report was approved.

Table A identifies the agenda items and appendix items. The agenda items in the Report are identified by Reference Key Number, title, page number and the appendices by appendix designations. The acronyms for organizations and technical terms used throughout the agenda are identified in Table B. The first four digits of the Reference Key Numbers of the items are assigned from The Subject Series List. The status of each item contained in the report is designated as one of the following: **(D) Developing Item:** the Committee determined the item has merit; however, the item was returned to the submitter or other designated party for further development before any action can be taken at the national level; **Informational (I) Item:** the item is under consideration by the Committee but not proposed for Voting; **(V) Voting Item:** the Committee is making recommendations requiring a vote by the active members of NCWM; **(W) Withdrawn Item:** the item has been removed from consideration by the Committee.

Table C provides a summary of the results of the voting on the Committee's items and the report in its entirety. Some Voting Items are considered individually; others may be grouped in a consent calendar. Consent calendar items are Voting Items that the Committee has assembled as a single Voting Item during their deliberation after the Open Hearings on the assumption that the items are without opposition and will not require discussion. The Voting Items that have been grouped into consent calendar items will be listed on the addendum sheets. Prior to adoption of the consent calendar, the Committee entertains any requests from the floor to remove specific items from the consent calendar to be discussed and voted upon individually.

Proposed revisions to the handbook(s) are shown as follows: 1) deleted language is indicated with a **bold face font using ~~strikeouts~~** (e.g., **~~this report~~**), 2) proposed new language is indicated with an **<u>underscored bold-faced font</u>** (e.g., **<u>new items</u>**), and 3) nonretroactive items are identified in *italics*. When used in this report, the term "weight" means "mass."

Note: The policy of NIST is to use metric units of measurement in all publications; however, recommendations received by NCWM technical committees and regional weights and measures associations have been printed in this publication as submitted. Therefore, the report may contain references to U.S. customary units.

Subject Series List

Table A
Table of Contents

Appendices

Table B
Glossary of Acronyms and Terms

Acronym	Term	Acronym	Term
CC	Certificate of Conformance	NCWM	National Conference on Weights and Measures
CIML	International Committee of Legal Metrology	NIST	National Institute of Standards and Technology
DoMC	Declaration of Mutual Confidence	NTEP	National Type Evaluation Program
IV	Initial Verification	OIML	International Organization of Legal Metrology
MAA	Mutual Acceptance Arrangement	OIML-CS	International Organization of Legal Metrology – Certificate System
MC	Measurement Canada	OWM	Office of Weights and Measures
MDMD	Multiple Dimension Measuring Devices	R	Recommendation
MRA	Mutual Recognition Arrangement	VCAP	Verification Conformity Assessment Program

Table C
Summary of Voting Results

Reference Key Number	*House of Senate Representatives*		*House of Delegates*		*Results*
	Yeas	*Nays*	*Yeas*	*Nays*	
To Accept the Report	Voice Vote				Adopted

Details of All Items
(In order by Reference Key)

INT – INTERNATIONAL

INT-1 I Mutual Recognition Arrangement (MRA)

Background / Discussion:
The MRA between Measurement Canada (MC) and NTEP labs originated April 1, 1994. Since that time, the original MRA has expanded, and a second MRA covering measuring devices was developed. On Tuesday July 26th, 2016, NCWM Chairman Mr. Jerry Buendel and Measurement Canada President Mr. Alan Johnston signed a renewal MRA that provides for continued cooperation between the two organizations and continuation of the beneficial partnership. The new MRA will be effective for 5 years.

The scope of the current MRA includes:

- gasoline and diesel dispensers;
- high-speed dispensers;
- gasoline and diesel meters intended to be used in fuel dispensers and truck refuelers;
- electronic computing and non-computing bench, counter, floor, and platform scales with a capacity up to 1000 kg (2000 lb);
- weighing/load receiving elements with a capacity of up to 1000 kg (2000 lb);
- electronic weight indicating elements (except those that are software based, i.e., programmed by downloading parameters); and
- mechanical scales up to 10 000 kg (20 000 lb).

MC, NTEP, and all our mutual stakeholders agree that the MRA is a benefit for the North American weights and measures industry. The NTEP Committee appreciates the efforts and cooperation of Measurement Canada and is working with MC to continue the cooperative arrangement.

The NTEP Weighing and Measuring Laboratories held their annual meeting and training in Gatineau/Ottawa Canada April 3-5, 2018. During that time all representatives attended a session at the at the Measurement Canada facilities. NCWM/NTEP wants to state their appreciation for the hospitality of the Measurement Canada staff.

INT-2 I OIML-Certification System (CS)

Background / Discussion:
In January 2018 the International Organization of Legal Metrology (OIML) MAA was officially replaced with the OIML-Certification System (CS). Information regarding the OIML-CS can be found at **www.oiml.org/maa/en/oiml-cs/general**. NCWM signed the OIML MAA Declaration of Mutual Confidence (DoMC) for Recommendation (R) 60 Load Cells as a Utilizing Participant in 2006 and NCWM signed the OIML-CS Utilizer Declaration in January 2018. A Utilizer is a participant which does not issue any OIML Certificate of Conformance (CC) nor OIML Test Reports but does utilize the reports issued by OIML-CS Issuing Authorities.

Because of difficulties encountered by the International Bureau of Legal Metrology (BIML) in adequately obtaining and summarizing peer review and/or accreditation data from the MAA test laboratories, it was proposed that a more robust OIML Certification System (OIML-CS) be developed that has a Management Committee to develop policy (subject to approval by the International Committee on Legal Metrology, or CIML) and oversee operations. A preliminary Framework Document for developing the OIML-CS was prepared and was presented to the CIML and approved at the 2016 CIML Meeting (in Strasbourg, France). On this basis, an OIML-CS Preliminary Management Committee (PrMC) was formed, which continued the work of developing the additional OIML-CS documents. Dr. Ehrlich represented the U.S. on the PrMC at meetings in Berlin, Germany, in February 2017, and in Shanghai, China, in June 2017. Mr. Darrell Flocken (NCWM/NTEP) accompanied Dr. Ehrlich to the Shanghai meeting, which also included a Seminar on the OIML-CS and a final meeting of the MAA Committee on Participation Review (CPR). The CIML approved the OIML-CS Framework Document (OIML B 18) at its annual meeting in Cartagena, Colombia, in October 2017, and the OIML-CS went into effect in January 2018.

Dr. Ehrlich serves on the Management Committee of the OIML-CS, and Mr. Flocken will serve on the Review Committee. The U.S. (NTEP) supported the OIML-CS process and has agreed to continue accepting OIML-CS R 60 test data for load cells with the provision that any use of manufacturer test data was clearly identified on the test report section of the certificate because NTEP cannot use manufacturer test data towards issuance of an NTEP certificate. The OIML-CS criteria align with the NTEP Committee's recommendations and the instructions provided by the NCWM Board of Directors.

Dr. Ehrlich requested, on multiple occasions, that NCWM review its policy regarding participation in the OIML MAA (and now the OIML-CS) R76 (Non-Automatic Weighing Instruments). The NCWM Board recapped the decision process to participate in the utilization of R60 test data. Existing policy from 2006 is not to participate in R76 until NCWM can do so as an Issuing Participant, now referred to under the OIML-CS as an Issuing Authority. The Board has revisited the 2006 discussions leading to that decision, including considerations for NTEP labs' workload, potential lost expertise, concerns with quality of evaluations at some foreign labs, etc. Dr. Ehrlich wanted NCWM to reconsider and, if there was no possibility in sight that the NCWM could become an Issuing Authority, then it should consider becoming a Utilizer Participant for OIML R76. Some U.S. manufacturers support NCWM policy, but others would like to have one-stop shopping. The OIML-CS also includes R49 (water meters), and R117 (RMFD) will be added next year (under what is called "Scheme A", which is the introductory level of the OIML-CS where "self-declaration" is used as the basis for demonstrating compliance with the OIML-CS). OIML R60 and OIML R76 are already under "Scheme A", where either accreditation or peer review required. Since there are no new developments to affect the decision, the NCWM Board of Directors agreed to maintain existing policy at this time.

From January 2011 to June 2018, 98 NTEP certificates for load cells were issued under the former MAA, now OIML Certification System. The NTEP Administrator has reviewed all test data and drafted the NTEP certificates.

Dr. Ehrlich is representing the U.S. interests in this work and will update the Board at the NCWM Annual Meeting in July 2018.

ACT – ACTIVITY REPORTS

ACT-1 I NTEP Participating Laboratories and Evaluations Reports

Background / Discussion:
The NTEP weighing and measuring laboratories held a joint meeting April 3-5, 2017, in Ottawa, Canada.

The NTEP weighing laboratories also met in August 2017, prior to the NTEP Weighing Sector meeting and the measuring laboratories met in September 2017, prior to the NTEP Measuring Sector meeting in Houston, TX to discuss current issues.

NTEP continues to routinely survey customers pertaining to NTEP administration and laboratories customer service. The survey is released to active CC holders. The board routinely reviews the results of the survey to form a continuous improvement plan for NTEP. With any survey, the challenge is to develop a document that is concise enough that customers will respond, while also providing a meaningful set of data. To date, the NCWM Board of Directors is finding general approval of NTEP services.

During the 2018 Interim Meeting the Committee reviewed NTEP statistics through December 2017. The review of statistics shows that incoming applications are relatively comparable to normal and there exist no significant laboratory backlog issues. See Appendix A for NTEP statistics.

ACT-2 I NTEP Sector Reports

Background / Discussion:
All NTEP Sector reports were available to members at the time NCWM Publication 15 was published. The NTEP Committee is committed to ensuring that electronic versions of sector reports are available with NCWM Publication 15. Please note that the sector reports will only be available in the electronic version of NCWM Publication 15 at **ncwm.net/meetings/interim/archive**; they will not be available in the printed versions of NCWM Publication 15.

NTEP Belt-Conveyor Scale Sector:
The NTEP Belt-Conveyor Scale Sector last met February 23, 2016, in Pittsburgh, Pennsylvania. The sector did not have sufficient NIST Handbook 44 and NCWM Publication 14 agenda items to justify a meeting in 2017 or 2018.

The next meeting of the NTEP Belt-Conveyor Scale Sector is being considered for late 2019 but has not been scheduled at this time. For questions on the status of sector work or to propose items for a future meeting, please contact the sector Technical Advisor:

Technical Advisor
Mr. John Barton
NIST, OWM
100 Bureau Drive, MS 2600
Gaithersburg, MD 20899
Phone: (301) 975-4002
Fax: (301) 975-8091
Email: **john.barton@nist.gov**

NTEP Grain Moisture Meter and NIR Protein Analyzer Sectors:

The NTEP Grain Analyzer Sector met August 16-17, 2017 in Kansas City. MO. A draft of the final summary was provided to the Committee prior to the 2018 NCWM Interim Meeting for review and approval (See Appendix B).

The next meeting of the NTEP Grain Moisture Meter and NIR Protein Analyzer Sectors is scheduled for August 15-16, 2018 in Kansas City, Missouri. For questions on the status of sector work or to propose items for a future meeting, please contact the Technical Advisor:

Technical Advisor
Ms. G. Diane Lee
NIST, OWM
100 Bureau Drive, MS 2600
Gaithersburg, MD 20707
Phone: (301) 975-4005
Fax: (301) 975-8091
Email: **diane.lee@nist.gov**

NTEP Measuring Sector:
The NTEP Measuring Sector met October 3-4, 2017 in Houston, TX. A draft of the final summary was provided to the Committee prior to the 2018 NCWM Interim Meeting for review and approval. (See Appendix C)

The next meeting of the NTEP Measuring Sector Meeting is scheduled for late September 25-26, 2018 in Baltimore, Maryland. For questions on the status of sector work or to propose items for a future meeting, please contact the sector Technical Advisor:

Technical Advisor
Ms. Tina Butcher
NIST, OWM
100 Bureau Drive, MS 2600
Gaithersburg, MD 20899
Phone: (301) 975-2196
Fax: (301) 975-8091
Email: **tina.butcher@nist.gov**

NTEP Software Sector:
The NTEP Software Sector met May 3, 2017 in Columbus, Ohio. It was a joint meeting with the NTEP MDMD Work Group. A final draft of the meeting summary was provided to the Committee prior to the 2018 NCWM Interim Meeting for review and approval. (See Appendix D)

The next meeting of the NTEP Software Sector is scheduled for August 22-23, 2018 in Louisville, Kentucky. The meeting will be a joint meeting of the NTEP Weighing Sector and Software Sector. For questions on the status of sector work or to propose items for a future meeting, please contact the sector Chair and/or the NTEP Specialist:

Chair
Mr. James Pettinato
FMC Technologies Measurement Solutions, Inc.
1602 Wagner Avenue
Erie, PA 16510
Phone: (814) 898-5250
Fax: (814) 899-3414
Email: **jim.pettinato@fmcti.com**

NTEP Specialist
Mr. Darrell Flocken
NCWM
1135 M Street, Suite 110
Lincoln, NE 68508
Phone: (614) 620-6134
Email: **darrell.flocken@ncwm.net**

NTEP Weighing Sector:
The NTEP Weighing Sector met August 22-23, 2017, in Houston, Texas. A final draft of the meeting summary was provided to the Committee prior to the 2018 NCWM Interim Meeting for review and approval. (See Appendix E)

The next NTEP Weighing Sector meeting is scheduled for August 21-22, 2018 in Louisville, Kentucky. Plans are to meet jointly with the NTEP Software Sector at the same location August 22-23, 2018. For questions on the status of sector work or to propose items for a future meeting, please contact the sector Technical Advisor:

Technical Advisor
Mr. Rick Harshman
NIST, OWM
100 Bureau Drive, MS 2600
Gaithersburg, MD 20899
Phone: (301) 975-8107
Fax: (301) 975-8091
Email: **richard.harshman@nist.gov**

NTEP Multiple Dimension Measuring Devices (MDMD) Work Group:
The NTEP MDMD Work Group met March 2-3, 2017 in Columbus, Ohio. The second day of the meeting was a joint meeting with the NTEP Software Sector. A final draft of the meeting summaries was provided to the Committee prior to the 2018 NCWM Interim Meeting for review and approval. (See Appendix F)

The next NTEP MDMD Work Group meeting is scheduled for May 8-9, 2018 in Columbus, OH. For questions on the status of work group or to propose items for a future meeting, please contact Work Group Chair Mr. Robert Kennington or NTEP Specialist Mr. Flocken.

Chair
Mr. Robert Kennington
Quantronix, Inc.
P.O. Box 929
Farmington, UT 84025
Phone: (801) 939-9520
Email: **rkennington@cubiscan .com**

NTEP Specialist
Mr. Darrell Flocken
NCWM
1135 M Street, Suite 110
Lincoln, NE 68508
Phone: (614) 620-6134
Email: **darrell.flocken@ncwm.net**

The NTEP Committee reviewed and approved all 2017 NTEP Sector and Work Group reports during the 2018 Interim Meeting.

CAP – CONFORMITY ASSESSMENT PROGRAM

CAP-1 I Conformity Assessment Program

Background / Discussion:
The Conformity Assessment Program was established to ensure devices produced after the device has been type evaluated and certified by NTEP continue to meet the same requirements. This program has three major elements: 1) Certificate Review (administrative); 2) Initial Verification (inspection and performance testing); and 3) Verified Conformity Assessment (influence factors). This item is included on the Committee's agenda to provide an update on these elements.

Certificate Review:
Certificates are constantly under review by NTEP staff and laboratories. Many active certificates are amended annually because of manufacturer submission for evaluation or issues reported by the states pertaining to information on the certificate. When the devices are re-evaluated and certificates are amended, all information is reviewed and necessary steps are taken to assure compliance and that accurate, thorough information is reported on the certificate.

In an effort to keep certificate information up to date, the Committee continues to offer an opportunity for active certificate holders to update contact information that is contained in the "Submitted By" box on certificates. This is offered during the payment period of their annual maintenance fee. Many CC holders have taken advantage of the opportunity for hundreds of NTEP certificates.

Initial Verification (IV):
The IV initiative is ongoing. Field enforcement officials perform an initial inspection and test on new installations on a routine basis. The Committee recognized that the states do not want IV reporting to be cumbersome.

An IV report form was developed several years ago. The Committee desired a simple form, perhaps web-based for use by state and local regulators. The form was approved by the Committee and distributed to the states. A completed form can be submitted via mail, e-mail, fax, or online. The form is available to regulatory officials who are members of NCWM at **www.ncwm.net/ntep/conformity/verification.**

NTEP has acknowledged that the state, county and city regulators have not bought into the IV report form. Industry representatives stated that IV is very important to ensure conformity assessment and the NCWM should push harder for reporting of non-compliance issues found during IV.

NTEP is open to suggestions on how to improve the reporting of non-compliant devices found during initial verification.

VCAP:
NCWM has been concerned about production meeting type and protecting the integrity of the NTEP CC since the inception of NTEP. The board has consistently reconfirmed its belief that conformity assessment is vital to NTEP's continued success.

Load cells traceable to NTEP certificates were selected for the initial assessment effort. NCWM elected to require a systems audit checklist that is to be completed by an outside auditor and submitted to NCWM per Section 21.3.3.3.5 of the VCAP requirements. A VCAP Systems Audit Checklist for Manufacturers and a VCAP Systems Audit Checklist for Private Label Certificate Holders have been developed and are available on the website at **www.ncwm.net/ntep/conformity/vcap/checklists-faqs.** Additionally, the Committee developed a new NCWM Publication 14, administrative policy to distinguish between the requirements for parent NTEP certificate holders (21.3.3.2) and private label certificate holders. The requirements in 21.3.3.7 track the private label checklist requirements: traceability to parent NTEP CC, traceability of the private label cell to a VCAP audit, purchase and sales records, plan to report non-conforming product and non-conforming product in stock, plan to conduct internal audits to verify non-compliance action, and internal audit records.

Updated Statistics: The Committee was given updated VCAP statistics and information during the 2018 Annual Meeting. As a result of VCAP activities for July 1, 2017 to June 1, 2018:

- **Load Cells:**
  - 29 new or amended CC's were issued since July 1, 2017. Of these 29, 3 CC were issued to 2 new manufacturers. Manufacturers have until November 2018 to become VCAP compliant.
  - No CC were made inactive since July 1, 2017 because of VCAP noncompliance.
- **W/LRE ≥ 2000 lb w/non NTEP load cells:**
  - 13 new or amended CC's, within this VCAP device category, were issued since July 1, 2017. Of these 13, 1 CC was issued to a new manufacturer. The manufacturer has until February 2019 to become VCAP compliant.
  - No CC were made inactive since July 1, 2017 because of VCAP noncompliance.
- **Indicating Elements:**
  - 18 new or amended CC's were issued since July 1, 2017. Of these 18, 2 CC's were issued to 2 new manufacturers. The manufacturers have until March and August 2019 to become VCAP compliant.
  - No CC were made inactive since July 1, 2017 because of VCAP noncompliance.
- **Complete Scales:** This device category has a compliance deadline of the end of June 2018 for manufacturers and the end of December 2018 for private label CC holders.
  - 5 new CC holding companies have been added to VCAP for this category of device types since the original 56 reported on last year; bringing the total number of manufacturers requiring VCAP audits to 61.
    - 57 are manufacturers
    - 4 are private labelers.
  - 63 new or amended CC's were issued since July 1, 2017
  - For the addition of this device type, and future device types, it is not possible to report on the exact number of manufacturers which have included this device type into their VCAP program. This is because of the most recent VCAP Policy change not requiring manufactures with current VCAP compliance status to undergo an audit for the new device type. Compliance will be determined at their external audit. We can report that 2 new manufacturers have received their first CC and have until January 2019 to become VCAP compliant.

Misc. VCAP Information:

1. To date the NTEP Specialist has audited 16 companies totaling 19 locations.
2. My current audit backlog, in scheduled audits, consists of 3 new companies and 1 current customer.
3. The NTEP Specialist will begin scheduling re-assessment audits (the 3-year schedule) in the second half of 2018.

VCAP Audits: The Committee had discussions about the required number of audits for facilities that manufacture multiple device types. For example, if a company had successful audits for two device types, they might submit a request for a delay from audit requirements for remaining device types, stating that they are all subjected to the same processes and will be audited in the next cycle. The Committee agreed to the request in principal and directed the NTEP Administrator to develop NCWM policy language. As a result, the following policy was adopted by the NCWM Board in 2013.

Adding Device Categories to VCAP:

Policy:

1. When a new device category is added to the VCAP requirement, NTEP will recognize the current VCAP audit certification in effect, submitted by a certificate holder, for the same certificate holder and same production facility(s), to cover the new device category, continue the manufacturing process for devices covered by NTEP certificates in the newly added device category, until the due date of the next VCAP audit.

   Example: If a company had successful audits for two device types, they might submit a request for exemption from audit requirements for remaining device types, stating that they are all subjected to the same quality management system and will be included in the next audit cycle. The next VCAP audit must be done within 3 years of the last audit and address all applicable device types produced within that facility.

Seven weighing device categories subject to influence factors, as defined in NIST Handbook 44, were identified and are subject to VCAP audits. The VCAP process requirement is ongoing for load cells, weighing elements that use non-NTEP load cells and indicating elements. Certificate holders for these device types are required to have an on-site audit of the manufacturer's quality system and on-site random and/or review of a production device by an outside auditor to verify compliance with VCAP. The NTEP Committee and NCWM Board agreed not to include weighing/load receiving elements using NTEP load cells in the list of device categories subject to VCAP. However, the Board notified certificate holders that they have no intention of amending the table of devices subject to influence factor testing found in the Weighing Devices Section of NCWM Publication 14.

Certificate holders are encouraged to research the VCAP requirements on the NCWM website under the NTEP, Conformity Assessment section. Certificate holders are encouraged to review the VCAP requirements applicable to their devices and report concerns to the NTEP Committee.

The following disclaimer has been advertised and communicated by NCWM: "NCWM is working to identify all active certificates subject to VCAP compliance. As a courtesy, affected certificate holders are being notified of VCAP requirements and the established time line. Please note that the NCWM Board of Directors does not consider it to be NCWM's responsibility to notify all certificate holders about affected certificates. Certificate holders are responsible for reviewing their active NTEP certificates and compliance with VCAP."

The Committee has received letters, questions, and many other inquiries pertaining to VCAP. The Committee has worked diligently to answer the questions submitted in a very timely manner. The Committee knows that additional questions will be posed as VCAP progresses. Certificate holders and other interested parties are encouraged to submit written questions to the NTEP Committee. The Committee is pleased to report that it has been successful in answering all the questions to date. Clerical changes and additions have been made to affected VCAP documents as deemed necessary.

CAP-2 I Timelines for Remaining Device Categories Subject to VCAP

Source:
NTEP Committee

Item under Consideration:
NCWM decided to include the four remaining device categories subject to VCAP as soon as practicable. In 2016, the Committee worked to develop a timeline to include the remaining categories. NTEP has developed the following proposed timelines to phase in the remaining device categories. The timelines identify the inclusion of the remaining device types into the NTEP, Verified Conformity Assessment Program. Each timeline includes both manufacturers and private label holders of Certificates of Conformance for the device type. The NTEP Committee is moving forward with the following timelines.

Background / Discussion:
The Committee heard comments proposing that the remaining device categories be phased in over a several-year period. The Committee appreciates the input from the stakeholders.

When VCAP requirements are applied, the certificate holder is required to have an on-site audit of the manufacturer's quality system and on-site random and/or review of a production device by an outside auditor to verify compliance with VCAP. Certificate holders are encouraged to research the VCAP requirements on the NCWM website under the NTEP, Conformity Assessment section, review the VCAP requirements applicable to their devices and report concerns to the NTEP Committee.

Complete Scales:
This device type includes, but is not limited to, Computing, Non-computing, Point of Sale, Crane, Monorail, and Grain Test Scales with weighing capacities up to and including 2000 lb. It is important to note that the use of an NTEP certified load cell does not qualify the scale for an exemption to the VCAP requirements.

<table>
<tr><th colspan="6">NCWM/NTEP VCAP Compliance Timeline
Complete Scales</th></tr>
<tr><th>Jan 2017–
March 2017</th><th>Jan 2017-
May 2018</th><th>Jan 2017-
Nov 2018</th><th>Jan 2017-
Dec 2018</th><th>Jun 2018</th><th>Dec 2018</th></tr>
<tr><td rowspan="3">NTEP notifies active CC holders of VCAP requirements</td><td>Parent CC holders to put VCAP QM system in place</td><td>Private Label CC holders to put VCAP QM system in place</td><td>NTEP evaluates incoming audit reports</td><td rowspan="3">NCWM declares CCs inactive if Parent CC holder fails to comply with VCAP</td><td rowspan="3">NCWM declares CCs inactive if Private Label CC holder fails to comply with VCAP</td></tr>
<tr><td>CC holder to have audit completed by authorized auditing company</td><td>CC holder to have audit completed by authorized auditing company</td><td rowspan="2">NTEP contacts CC holders not meeting VCAP requirements to encourage compliance</td></tr>
<tr><td>Submit audit report to NCWM/NTEP</td><td>Submit audit report to NCWM/NTEP</td></tr>
</table>

Automatic Weighing Systems:

<table>
<tr><th colspan="6">NCWM/NTEP VCAP Compliance Timeline
Automatic Weighing Systems</th></tr>
<tr><th>July 2017–
Sept 2017</th><th>July 2017-
Nov 2018</th><th>July 2017-
May 2019</th><th>July 2017-
Jun 2019</th><th>Dec 2018</th><th>Jun 2019</th></tr>
</table>

NTEP notifies active CC holders of VCAP requirements	Parent CC holders to put VCAP QM system in place	Private Label CC holders to put VCAP QM system in place	NTEP evaluates incoming audit reports	NCWM declares CCs inactive if Parent CC holder fails to comply with VCAP	NCWM declares CCs inactive if Private Label CC holder fails to comply with VCAP
	CC holder to have audit completed by authorized auditing company	CC holder to have audit completed by authorized auditing company	NTEP contacts CC holders not meeting VCAP requirements to encourage compliance		
	Submit audit report to NCWM/NTEP	Submit audit report to NCWM/NTEP			

Automatic Bulk Weighing Systems:

NCWM/NTEP VCAP Compliance Timeline Automatic Bulk Weighing Systems					
Jan 2018– March 2018	**Jan 2018- May 2019**	**Jan 2018- Nov 2019**	**Jan 2018- Dec 2019**	**Jun 2019**	**Dec 2019**
NTEP notifies active CC holders of VCAP requirements	Parent CC holders to put VCAP QM system in place	Private Label CC holders to put VCAP QM system in place	NTEP evaluates incoming audit reports	NCWM declares CCs inactive if Parent CC holder fails to comply with VCAP	NCWM declares CCs inactive if Private Label CC holder fails to comply with VCAP
	CC holder to have audit completed by authorized auditing company	CC holder to have audit completed by authorized auditing company	NTEP contacts CC holders not meeting VCAP requirements to encourage compliance		
	Submit audit report to NCWM/NTEP	Submit audit report to NCWM/NTEP			

Belt-Conveyor Scales:

NCWM/NTEP VCAP Compliance Timeline Bulk-Conveyor Scales					
July 2018– Sept 2018	**July 2018- Nov 2019**	**July 2018- May 2020**	**July 2018- Jun 2020**	**Dec 2019**	**Jun 2020**
NTEP notifies active CC holders of VCAP requirements	Parent CC holders to put VCAP QM system in place	Private Label CC holders to put VCAP QM system in place	NTEP evaluates incoming audit reports	NCWM declares CCs inactive if Parent CC holder fails to comply with VCAP	NCWM declares CCs inactive if Private Label CC holder fails to comply with VCAP
	CC holder to have audit completed by authorized auditing company	CC holder to have audit completed by authorized auditing company	NTEP contacts CC holders not meeting VCAP requirements to encourage compliance		
	Submit audit report to NCWM/NTEP	Submit audit report to NCWM/NTEP			

Background / Discussion:

A scale company asked if the Committee had given any thought to expanding the VCAP audit to a five-year period. NTEP Administrative Policy Section 21.1.3.2.16 allows for a five-year cycle under specific conditions. The NTEP Committee has agreed to explore the issue and develop guidelines and recommendations for the certification bodies.

Another scale company requested that NTEP develop a unified spreadsheet for VCAP. The Committee agrees and has directed NTEP to develop the checklist (spreadsheet) for manufacturers and VCAP auditors use.

Two scale companies requested that NTEP consider exempting Automatic Weighing Systems (AWS) and Automatic Bulk Weighing Systems (ABWS) from the VCAP audit requirement if they utilize NTEP certified load cells. The Committee discussed both device categories during their work session. The Committee found that all AWS NTEP certificates were for complete devices per NTEP Technical Policy. Some research also revealed that most ABWS certificate were for the ABWS controller. The hoppers normally used in an ABWS are covered by their own weighing/load-receiving NTEP and are several thousand-pound capacity, hence already outside the VCAP requirement since they exceed the 2000 lb capacity or less threshold. The Committee was made aware of three NTEP certificates for ABWS which have a capacity of 2000 lb or less but all three were for complete weighing devices. The Committee concluded that certificates for AWS and ABWS devices are for complete scales or indicating elements/controllers and require a VCAP audit.

Additional comments from affected stakeholders are welcomed and appreciated.

OTH – OTHER ITEMS

OTH-1 I Electronic Vehicle Fueling Systems (EVFS)

Source:
California Division of Measurement Standards & NTEP Measuring Laboratories

Item under Consideration:
Work with U.S. National Work Group Representatives and other experts to develop an NTEP checklist for electronic vehicle supply equipment (EVSE).

Background / Discussion:
In July 2015, the NCWM adopted a tentative code for electronic vehicle fueling systems. The tentative code includes a provision that allows NTEP to accept EVSE for type evaluation to the NIST Handbook 44 code. The USNWG for EVSE developed the tentative code in Handbook 44 and has been working to address evaluation criteria (NTEP checklist) and test standards to be used.

The NTEP Measuring Labs discussed the item during their meeting on September 20, 2016. The consensus of the laboratories was that the examination procedure outline developed by the State of California was not in a proper NCWM Pub 14 checklist format. Another prime issue that is still being developed is the test equipment necessary to test these devices. NTEP cannot evaluate without standards for test equipment. Will NIST traceability be required? The Measuring Laboratories concluded that the present Pub 14 checklist for RMFDs would be a good starting point to use in drafting a Pub 14 checklist for EVSE. The NTEP Administrator and NTEP Measuring Laboratories recommend the NCWM Board of Directors / NTEP Committee consider establishing an NTEP Work Group or Task Force to address the EVSE issues.

The NTEP Committee agreed with the recommendations of the NTEP Measuring Laboratories and worked to establish a NTEP EVSE Work Group. The NTEP EVSE Work Group was developed with Mr. Andrei Moldoveanu, Senior Program Manager for NEMA appointed as Chair. The Work Group consisted of seven public sector members and six private sector members representing associate membership.

THE NTEP EVSE Work Group (WG) had their kick-off web-based meeting March 14, 2017. The WG had monthly web meetings with the initial goal of having a draft checklist ready for NCWM Board/NTEP Committee review. Significant progress has been made and during the 2018 Interim Meeting the NTEP Committee reviewed the updated Work Group's draft NTEP checklist. NTEP was given permission to proceed with checklist development and evaluations as deemed appropriate. NTEP is working with NIST/OWM to ensure proper requirements for test standards and test procedures are in place. Some technical policy issues still need to be worked out.

The CA Lab is in the process of purchasing EVSE test standards for both laboratory and field testing. For questions on the status of the work group please contact NTEP Administrator Jim Truex at **jim.truex@ncwm.net** .

OTH-2 I Create a NCWM Publication 14 Category for Software

Source: NTEP Software Sector

Item under Consideration:
Create a Publication 14 Software category, which includes requirements, considerations and test procedures common to all software-based devices, including software-only products.

Background / Discussion:
There is no single Publication 14 device category in which to place software-specific requirements, considerations and test procedures. Since most modern measurement devices contain software, to appropriately address any concerns each section of Publication 14 must include all software considerations. Further, each device section has a different governing Sector, which makes the process of change an exercise in convincing each Sector to make needed additions while keeping those additions harmonized across Sectors; an effort that has proven very difficult and time consuming.

Such a software section might include the following:

1. Models to be submitted for evaluation
   a. What constitutes approved software?
      i. Measurement and presentation
      ii. Calculations based on a measured value
      iii. Manual entry of measured value
      iv. Other
   b. Application of software may lead to additional Pub. 14 section consideration
   c. Minimum computing requirements statement
2. Software Identification
   a. Appropriate means of 'marking' metrologically significant software
   b. Software Separation and marking consequences
   c. Relationship between software and software identifier
   d. Presentation of software identifier
      i. Example icons and menu text
      ii. Exceptions
3. Protection against unauthorized software change
   a. How is software "sealed"?
   b. Remote software update considerations
   c. Audit trail (if employed) requirements for software updates

4. Accuracy of data calculations
    a. When to stop evaluating calculations & data manipulation

5. Software Evaluation Checklist

Future Topics

1. Distributed software considerations
    a. Securing communications between metrologically significant distributed software modules or components of a system

The NTEP Committee reviewed and discussed the proposal from the NTEP Software Sector. The Committee is very interested in this idea but heard no comment during the 2018 Interim Meeting open hearings. The Committee is requesting additional input from manufactures, NTEP sectors and others from the weights and measures community.

During the 2018 Annual Meeting open hearings NTEP Software Sector Chair Mr. Jim Pettinato encouraged the Committee to seriously consider and move forward with the proposal. The Sector thinks this would improve the type evaluation process and avoid deviation in language or requirements from Pub 14 section to Pub 14 section. He also pointed out that internationally there is a separate document for software.

Ms. Kristin Macey, California | NTEP Committee Chair
Mr. James Cassidy, City of Cambridge, Massachusetts | NCWM Chair
Mr. Brett Gurney, Utah | NCWM Chair-Elect
Mr. Kenneth Ramsburg, Maryland | Member
Mr. Craig VanBuren, Michigan | Member
Mr. Jim Truex, NCWM | NTEP Administrator

National Type Evaluation Program Committee

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Appendix A

NTEP Statistics Report

General NTEP Statistics	**Last Year**	**This Year**
	10/01/16 – 9/30/17	10/01/17 – 3/31/18
Total Applications Processed	(25) 297	(8) 181
Applications Completed	320	138
New Certificates Issued	291	132
Active NTEP Certificates		2058

( ) = Reactivations

Assignments to Labs per Year	10/1/16 – 9/30/17	10/01/17 – 3/31/18
California	22	(1) 10
Canada	4	2
GIPSA-IL	0	0
GIPSA-KC	8	1
Kansas	1	1
Maryland	(1) 33	9
New York	(5) 26	(3)17
NIST Force Group	4	4
North Carolina	10	(1) 4
Ohio	(2) 75	42
Oregon	0	0
NTEP Field	3	(1) 5
NTEP Administrator	119	53
Applications Not Yet Assigned to a Lab		1

( ) = Reassignments from another lab

Process Statistics	**10/2008 - Present**
Average Time to Assign an Evaluation	4.4 Days
Average Time to Complete an Evaluation	84.1 Days

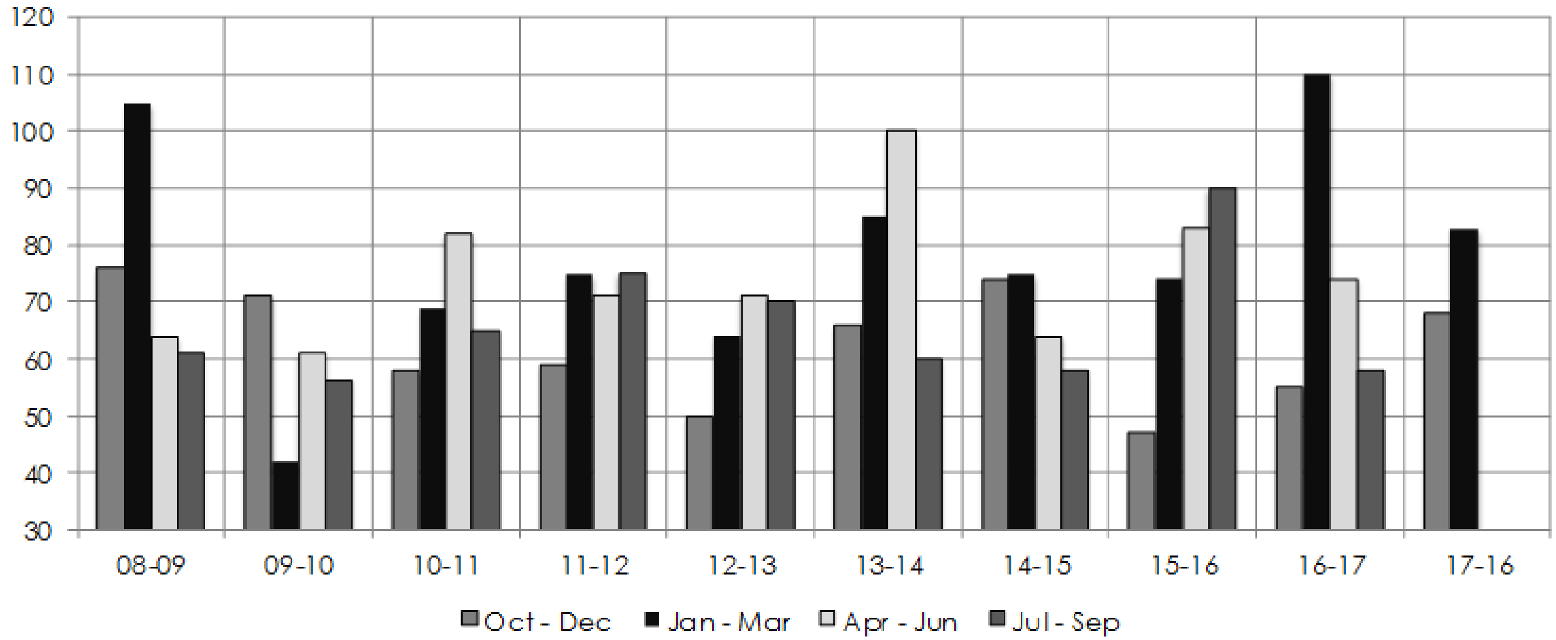
Report on Evaluations in Progress

Evaluations in Progress	**0-3 Months**	**3-6 Months**	**6-9 Months**	**9-12 Months**	**Over 1 Year**	**Total**
March 31, 2014	53	23	13	17	11	116
June 30, 2014	55	30	14	8	19	117
September 30, 2014	44	38	18	6	19	126
December 31, 2014	44	17	17	12	16	125
March 31, 2015	43	24	10	13	17	106
June 30, 2015	39	21	12	5	15	107
September 18, 2015	28	20	8	5	12	92
December 23, 2015	43	14	5	7	13	73

March 31, 2016	48	15	7	6	8	82
June 30, 2016	57	13	7	3	7	84
September 30, 2016	60	31	9	5	7	87
December 22, 2016	34	30	21	6	9	112
March 30, 2017	45	14	6	12	7	100
June 30, 2017	42	27	5	5	11	84
September 30, 2017	32	21	16	4	14	90
December 31, 2017	38	15	15	9	13	90
March 31, 2018	**44**	**15**	**8**	**10**	**12**	**89**

In Progress by Lab	0-3 Months	3-6 Months	6-9 Months	9-12 Months	Over 1 Year	Total
California	4	3	1			**8**
Canada	2		1	1		**4**
GIPSA-IL						
GIPSA-KC	1		3	5	1	**10**
Kansas		1				**1**
Maryland	7	1		2	6	**16**
New York	5	2	1		3	**11**
NIST Force Group	2	2				**4**
North Carolina	1					**1**
Ohio	12	5	1	1		**19**
Oregon						
NTEP Staff	8	1	1	1	2	**13**
Unassigned	2					**2**
					Total Pending:	**89**

10-Year Report on Applications Received by Quarter



	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18
Oct – Dec	76	71	58	59	50	66	74	47	55	68
Jan – Mar	105	42	69	75	64	85	75	74	110	83
Apr – Jun	64	61	82	71	71	100	64	83	74	
Jul - Sep	61	56	65	75	70	60	58	90	58	
Total	**306**	**230**	**274**	**280**	**255**	**311**	**271**	**294**	**297**	**151**

Average Per Quarter: 10-YR: **70.2**

Average Per Quarter This FY: **75.5**

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Appendix B

National Type Evaluation Program (NTEP) Belt-Conveyor Scale (BCS) Sector Meeting Summary

(No BCS Meetings were held during the 2017-2018 reporting period.)

5200-2 INTRODUCTION

The charge of the BCS Sector is important in providing appropriate type evaluation criteria based NIST Handbook 44, "Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices," Sections 1.10. General Code and 2.21. BCS Systems. The Sector's recommendations are presented to the National Type Evaluation Program (NTEP) Committee each January for approval and inclusion in NCWM Publication 14, "Technical Policy, Checklists and Test Procedures" for National Type Evaluation.

The Sector is also called upon occasionally for technical expertise in addressing difficult NIST Handbook 44 issues on the agenda of National Conference on Weights and Measures (NCWM) Specifications and Tolerances (S&T) Committee. Sector membership includes industry, NTEP laboratory representatives, technical advisors, and the NTEP Administrator. Meetings are held annually, or as needed and are open to all NCWM members and other registered parties.

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Appendix C

National Type Evaluation Program
Grain Analyzer Sector Meeting Summary

November 1, 2017

5200-2 INTRODUCTION

The charge of the National Type Evaluation (NTEP) Grain Analyzer Sector is important in providing appropriate type evaluation criteria based on NIST Handbook 44, "Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices," Sections 1.10. General Code, 5.56.(a) and 5.56.(b) Grain Moisture Meters, and 5.57. Near-Infrared Grain Analyzers. The Sector's recommendations are presented to the National Type Evaluation Program (NTEP) Committee each January for approval and inclusion in NCWM Publication 14, "Technical Policy, Checklists, and Test Procedures" for national type evaluation.

The Sector is also called upon occasionally for technical expertise in addressing difficult NIST Handbook 44 issues on the agenda of National Conference on Weights and Measures (NCWM) Specifications and Tolerances (S&T) Committee. Sector membership includes industry, NTEP laboratory representatives, technical advisors, and the NTEP Administrator. Meetings are held annually, or as needed and are open to all NCWM members and other registered parties.

Proposed revisions to the handbook(s) are shown as follows: 1) deleted language is indicated with a **bold face font using ~~strikeouts~~** (e.g., **~~this report~~**), 2) proposed new language is indicated with an **underscored bold-faced font** (e.g., **new items**), and 3) nonretroactive items are identified in *italics*. There are instances where the Sector will use **red** text and/or highlighted text to bring emphasis to text that requires additional attention. When used in this report, the term "weight" means "mass."

Note: It is the policy of the National Institute of Standards and Technology (NIST) to use metric units of measurement in all its publications; however, recommendations received by NCWM technical committees and regional weights and measures associations have been printed in this publication as submitted. Therefore, the report may contain references in U.S. customary units.

Table A
Table of Contents

Table B
Glossary of Acronyms and Terms

Acronym	Term	Acronym	Term
BIML	International Bureau of Legal Metrology	NTETC	National Type Evaluation Technical Committee
CD	Committee Draft	OCP	Ongoing Calibration Program
CIML	International Committee of Legal Metrology	OIML	International Organization of Legal Metrology
CIPM	International Committee of Weights and Measures	OWM	Office of Weights and Measures
D	Document	R	Recommendation
EMRP	European Metrology Research Program	S&T	Specifications and Tolerances
FGIS	Federal Grain Inspection Service	SC	Subcommittee
GA	Grain Analyzer	SD	Secure Digital
GIPSA	Grain Inspection, Packers and Stockyards Administration	TC	Technical Committee
GMM	Grain Moisture Meter	TW	Test Weight
MRA	Mutual Recognition Agreement	UGMA	Unified Grain Moisture Algorithm
NCWM	National Conference on Weights and Measures	USB	Universal Serial Bus
NIR	Near Infrared Grain Analyzer	USDA	United States Department of Agriculture
NIST	National Institute of Standards and Technology	USNWG	United States National Working Group
NTEP	National Type Evaluation Program		

Details of All Items
(In order by Reference Key)

1. Selecting a new NTETC Grain Analyzer Chairperson

The Grain Analyzer (GA) Sector nominated Mr. Karl Cunningham to serve as the NTETC GA Chairperson and he has served in this position since the 2015 Grain Analyzer Sector Meeting. Mr. Cunningham requested that the selection of a new NTETC chairperson be added to the 2017 GA Sector agenda. Mr. Cunningham has been instrumental in assistance with grain sample distributions for proficiency test and has agreed to continue to assist in this capacity. In accordance with the NTEP Administrative policies there is no fixed term for the NTETC GA Chair position, the Sector Chair must be a member of NCWM, and the Sector Chair is appointed by the NTEP committee Chair Sector members are asked to consider nominations for a New Committee Chair for the 2018 NTETC GA Sector.

During the 2017 GA Sector Meeting, Mr. Jim Truex (NTEP Administrator) reviewed Publication 14 Administrative Policy for Sector Committee Chair and Ms. Diane Lee talked about the benefits to being the GA Sector Committee Chair, one being the ability to participate in the development of the Sector agenda. Following discussion of this item, no one was nominated or volunteered for the position. Mr. Cunningham (Committee Chair) noted after the discussion of this item that since no one was nominated or volunteered for the chair position, that he is willing to continue working with the GA Sector as Committee Chair.

2. Report on the 2016 NCWM Interim and Annual Meetings

The 2017 NCWM Interim Meeting was held January 8–11 in San Antonio, Texas. The 2017 NCWM Annual Meeting was held July 16–20 in Pittsburgh, Pennsylvania. At these meetings, there were no Grain Analyzer Sector recommended changes to NCWM Publication 14 or NIST Handbook 44. The Grain Analyzer Sector originally submitted an item on the S&T agenda, which was subsequently reassigned to NIST, OWM for development. See Grain Analyzer Agenda Item 4 concerning the definition of remote configuration for an update of activities on this item.

During the 2017 GA Sector Meeting Mr. Truex (NTEP Administrator) provide an update on the NCWM Interim and Annual Meetings. Mr. Truex reported that the total conference membership decreased from 2197 in 2016 to 2159 in 2017. He also confirmed that there were no Grain Analyzer Sector voting items on the 2017 interim or annual meeting agenda and that one developing item remains on the agenda concerning revisions to the definition of remote configuration capabilities. Further discussion on the Grain Analyzer Sector developing item is included under Agenda Item 4 of this summary.

3. Report on NTEP Evaluations and Ongoing Calibration Program (OCP) (Phase II) Testing

Mr. Jason Jordan (Grain Inspection, Packers and Stockyards Administration (GIPSA)) the NTEP Participating Laboratory for grain analyzers, provided a list of grain analyzers that are enrolled in the Ongoing Calibration Program (OCP), Phase II testing for the 2016 harvest. There are 8 grain analyzer models enrolled for the 2016 harvest.

The 8 models:

1. Dickey-john Corp. – GAC2500-UGMA
2. Dickey-john Corp. – GAC2000, GAC2100, GAC2100a and GAC2100b
3. Perten Instruments Inc. - AM5200 and AM5200-A (UGMA)
4. Perten Instruments Inc. – IM9500 and IM9500 HLW/TW
5. Foss North America – Infratec 1241
6. Foss North America – Infratec Nova

7. The Steinlite Corp. – SL95
8. MTC Moisture Analyzers – MTC 999 ES

During discussion of this item at the 2017 GA Sector meeting, Mr. Jordan provided the sector with an update on the NTEP Phase I evaluations and reported on the collection and analysis of the OCP (Phase II) data from the 2016 crop year. He reported that there is one instrument currently in phase I testing and this instrument may potentially be added to phase II testing for next year. Manufacturers should review the payment schedule for the year of test with a potential total number of 9 models in phase II testing to determine their appropriate contribution to the cost for phase II testing. See the 2015 Grain Analyzer Sector Report for the NTEP On-going Calibration Program (Phase II) Fee Schedule. Mr. Jordan also reported that the same 8 instrument models as listed above are the same models as last year and are in phase II testing for the current year.

4. Review of OCP (Phase II) Performance Data for Moisture and Test Weight per Bushel

At the Sector's August 2005 meeting it was agreed that comparative OCP data identifying the Official Meter and listing the average bias for each NTEP meter type should be available for annual review by the sector. Accordingly, Mr. Jordan (GIPSA, the NTEP Participating Laboratory) for grain analyzers provided data for inclusion in the 2017 Grain Analyzer Sector Meeting Agenda showing the performance of NTEP meters compared to the air oven. This data is based on the last three crop years (2014–2016) using calibrations updated for use during the 2016 harvest season.

The 2014-2016 Grain Moisture Meter (GMM) Phase II comparison graphs are available for view or can be downloaded for printing at **www.ncwm.net/_resources/dyn/files/75601146zc793ed4d/_fn/2014-2016+NCWM+Sector+GMM+Biases.pdf**

At the Sector's August 2012 meeting, it was agreed that TW comparison and correlation charts should be prepared for the 3 grains which are most likely to be subject to discounts on the basis of TW: Corn and two wheat classes and limited to Air Oven reference values less than 20% moisture. The wheat classes selected were: Hard Red Winter and Soft Red Winter. Accordingly, Mr. Jordan prepared data showing the performance of NTEP meters compared to the GIPSA reference Quart Kettle Test Weight Apparatus. Mr. Jordan provided this information for the Grain Analyzer Sector 2017 meeting agenda. This data is based on the last three crop years (2014 – 2016) using calibrations updated for use during the 2016 harvest season.

The 2014-2016 TW comparison and correlation charts and TW Phase II data are available for view or can be downloaded for printing at **www.ncwm.net/_resources/dyn/files/75601147zb094dddb/_fn/2014-2016+NCWM+Sector+TW+plots.pdf.**

During the 2017 GA Sector meeting, the Sector reviewed the phase II performance charts for moisture and test weight. During this review Ms. Diane Lee, NIST, asked if the data shows a reduction in the variation among the meters in the phase II program since the start of the NTEP phase II program. Mr. Jordan provided an example with corn and noted that the variation between moisture for the meters measuring corn has reduced from an average of about 0.6% to about 0.2% which provides some evidence that the NTEP phase II program is working to reduce measurement variability in the program. Seedburo asked if there was a problem with some of the grain samples shown in the chart and Ms. Cathy Brenner responded that there was a reduction in the overall number of samples needed due to the new meter technology, UGMA.

5. Modify the Definition of Remote Configuration Capability Appearing in Appendix D of NIST Handbook 44 to Recognize the Expanded Scope of "Remote Configuration Capability" (S&T Developing item 3600-5)

Source:
Originally proposed by the Grain Analyzer Sector but because NIST, OWM recognized that this item would affect other device types it was reassigned to NIST, OWM for further development.

Purpose:
Table S.2.5. *Categories of Device and Methods of Sealing* that appears in §5.56. (a) of *NIST Handbook 44* lists acceptable methods of sealing for various categories of GMMs. When the sector first recommended adding the table to *NIST Handbook 44* at their September 1996 meeting, the concept of making a change to a GMM from a remote site involved information "…sent by to the device by modem (or computer)." In 2011 this concept has expanded to include the ability of the measuring device to accept new or revised sealable parameters from a memory chip (e.g., an SD Memory Card that may or may not itself be necessary to the operation of the device), external computer, network, or other device plugged into a mating port (e.g., Universal Serial Bus (USB) port) on the measuring device or connected wirelessly to the measuring device. The changes proposed in Item Under Consideration expand the scope of "remote configuration capability" to cover instances where the "other device" may be necessary to the operation of the weighing or measuring device or which may be considered a permanent part of that device.

Item Under Consideration:
Modify the General Code by adding the following paragraph to address security for systems adjusted using removable media:

> **G-S.8.2. Devices and Systems Adjusted Using Removable Digital Storage Device. - For devices and systems in which the configuration or calibration parameters can be changed by use of a removable digital storage device, such as a secure digital (SD) card, USB flash drive, etc., security shall be provided for those parameters using an event logger in the device. The event logger shall include an event counter (000 to 999), the parameter ID, the date and time of the change, and the new value of the parameter. A printed copy of the information must be available on demand through the device or through another on-site device. In addition to providing a printed copy of the information, the information may be made available electronically. The event logger shall have a capacity to retain records equal to 10 times the number of sealable parameters in the device, but not more than 1000 records are required. (Note: Does not require 1000 changes to be stored for each parameter.)**
>
> **(Added 20XX)**

and exempt current sealing requirements from applying to devices and systems adjusted using a removable digital storage device by proposing changes to the sealing requirements in the following HB 44 code sections: 2.20., 2.21., 2.22., 2.24., 3.30., 3.31., 3.32., 3.33., 3.34., 3.35., 3.36., 3.37., 3.38., 3.39, 3.40., 5.55., 5.56. (a), and 5.58. This exemption is needed because the General Code paragraph being proposed will address the sealing of all device types and systems that can be adjusted using a removable digital storage device.

The following is an example of proposed changes to the Grain Moisture Meter Code, which are intended to provide the exemption noted for NIST HB 44, Section 5.56(a):

S.2.5. Provision for Sealing.

S.2.5.1. Devices and Systems Adjusted Using a Removable Digital Storage Device. - For those devices and systems in which calibration and configuration parameters, as defined in Appendix D, can be changed by use of removable digital storage device, security shall be provided for those parameters as specified in G-S.8.2.

S.2.5.2. All Other Devices. - Except on devices specified in S.2.5.1 and S.2.5.3. Provision shall be made for applying a security seal in a manner that requires the security seal to be broken, or for using other approved means of providing security (e.g., audit trail available at the time of inspection as defined in Table S.2.5. Categories of Device and Methods of Sealing) before any change that affects the metrological integrity of the device can be made to any mechanism.

(The paragraphs below are currently being discussed by the GA Sector. See discussion of this proposed change in Agenda Item 6)

S.2.5.3. *An event logger is required in the device; it must include an event counter (000 to 999), the parameter ID, the date and time of the change, and the new value of the parameter (for calibration changes* *consisting of multiple constants, the calibration version number may be used rather than the calibration constants.)*

*A printed copy of the information must be available through the device or through another on-site device. The event logger shall have a capacity to retain records equal to 25 times the number of sealable parameters in the device, but not more than 1000 records are required. (**Note:** Does not require 1000 changes to be stored for each parameter.)*
[Nonretroactive as of January 1, 20XX]

(Amended 20XX)

Background / Discussion:
Two common types of removable data storage devices are the USB flash drive and the Secure Digital (SD) memory card. A USB flash drive is a data storage device that includes flash memory with an integrated USB interface. USB flash drives are typically removable and rewritable, and physically much smaller than a floppy disk. A SD card is a non-volatile memory card format originally designed for use in portable devices. The SD standard is maintained by the SD Card Association.

Removable digital storage devices can be used in GMMs as either “data transfer” devices which are not necessary to the operation of the GMM or as “data storage devices” which are necessary to the operation of the GMM.

A USB flash drive is most likely to be used as a “data transfer” device. In a typical “data transfer” application, the USB flash drive is first connected to a computer with access to the web. The computer visits the GMM manufacturer’s web site and downloads the latest grain calibrations that are then stored in the USB flash drive. The USB flash drive is removed from the computer and plugged into a USB port on the GMM. The GMM is put into “remote configuration” mode to copy the new grain calibration data into the GMM’s internal memory. When the GMM has been returned to normal operating (measuring) mode the USB flash drive can be removed from the GMM.

Although an SD memory card could also be used as a “data transfer device” it is more likely to be used as a “data storage device”. In a typical “data storage device” application, the SD memory card stores the grain calibrations used on the GMM. The SD memory card must be plugged into an SD memory card connector on a GMM circuit card for the GMM to operate in measuring mode. To install new grain calibrations the GMM must be turned “off” or put into a mode in which the SD memory card can be safely removed. The SD memory card can either be replaced with an SD memory card that has been programmed with the new grain calibrations or the original SD memory card can be re-programmed with the new grain calibrations in much the same way as that described in the preceding paragraph to copy new grain calibrations into a USB flash drive. In either case, the SD memory card containing the new calibrations must be installed in the GMM for the GMM to operate in measuring mode. In that regard, the SD memory card can be considered a “permanent part” of the GMM in that the GMM cannot operate without it.

Note: In the above example “SD memory card” could be any removable flash memory card such as the Secure Digital Standard-Capacity, the Secure Digital High-Capacity, the Secure Digital Extended-Capacity, and the Secure Digital Input/Output, which combines input/output functions with data storage. These come in three form factors: the original size, the “mini” size, and the “micro” size. “Memory Stick” is a removable flash memory card format, launched by Sony in 1998, and is also used in general to describe the whole family of Memory Sticks. In addition to the original Memory Stick, this family includes the Memory Stick PRO, the Memory Stick Duo, the Memory Stick PRO Duo, the Memory Stick Micro, and the Memory Stick PRO-HG.

See the NCWM S&T Committee 2013-2016 Final Reports and the Grain Analyzer Sector 2013-2016 summaries for additional background information and to review the different proposals considered by the NCWM S&T committee and Grain Analyzer Sectors.

During the 2017 GA Sector meeting, the Sector members reviewed the proposed changes and by consensus agreed with the proposed changes to NIST Handbook 44, Section 5.56(a) and the General Code. The Sector recognized that the proposed paragraph S.2.5.3included in the item for consideration as changes to NIST HB44 Section 5.56(a) is still under discussion (See agenda Item 6 in this summary) and is not currently being proposed for consideration.

6. Adding a Nonretroactive Requirement to NIST HB 44 Grain Moisture Meter Code 5.56(a) that Grain Moisture Meters meet Category 3 Sealing Requirements

Source:
Grain Analyzer Sector

Purpose:
At the 2016 Grain Analyzer Sector Meeting during its discussion of Agenda Item 5 "Modify the Definition of Remote Configuration Capability that is defined in Appendix D of NIST Handbook 44 to Recognize the Expanded Scope of "Remote Configuration Capability" (S&T Developing item 3600-5)" it was noted that the current technology for sealing grain moisture meters are with event loggers (category 3 sealing requirements). Due to the complexity of these devices, a Category 3 sealing provides a record of what calibration and configuration parameters were changed. As such, the GA Sector discussed including a non-retroactive requirement for category 3 sealing for all grain moisture meters. Currently NIST HB 44 NIR code for devices that measure protein, oil and starch requires that the device be sealed with an event logger. These meters also measure moisture and currently meet category 3 requirements.

Item Under Consideration:
The GA Sector's technical advisor included the following proposal for changes to the Grain Analyzer Code 5.56(a) in the 2016 Grain Analyzer Sector Summary for review:

S.2.5. Provision for Sealing.

...

S.2.5.3. *An event logger is required in the device; it must include an event counter (000 to 999), the parameter ID, the date and time of the change, and the new value of the parameter (for calibration changes consisting of multiple constants, the calibration version number may be used rather than the calibration constants.)*

*A printed copy of the information must be available through the device or through another on-site device. The event logger shall have a capacity to retain records equal to 25 times the number of sealable parameters in the device, but not more than 1000 records are required. (**Note:** Does not require 1000 changes to be stored for each parameter.)*
[Nonretroactive as of January 1, 20XX]
(Amended 20XX)

Mr. Doug Musick (Kansas) submitted the following alternate proposal:

Table S.2.5. Categories of Device and Methods of Sealing	
Categories of Device	***Methods of Sealing***
Category 1*[1]*: *No remote configuration capability.*	*Seal by physical seal or two event counters: one for calibration parameters (000 to 999) and one for configuration parameters (000 to 999). If equipped with event counters, the device must be capable of displaying, or printing through the device or through another on-site device, the contents of the counters.*

Table S.2.5. Categories of Device and Methods of Sealing	
Categories of Device	***Methods of Sealing***
Category 2[1]: *Remote configuration capability, but access is controlled by physical hardware.* *A device shall clearly indicate that it is in the remote configuration mode and shall not be capable of operating in the measure mode while enabled for*	*The hardware enabling access for remote communication must be at the device and sealed using a physical seal or two event counters: one for calibration parameters (000 to 999) and one for configuration parameters (000 to 999). If equipped with event counters, the device must be capable of displaying, or printing through the device or through another on-site device, the contents of the counters.*
Category 3[2]: *Remote and/or no remote configuration capability access. Access may be unlimited or controlled through a software switch (e.g., password).* *When accessed for modifying sealable parameters, the device shall clearly indicate that it is in the configuration mode and shall not can operate in the measuring mode.*	*An event logger is required in the device; it must include an event counter (000 to 999), the parameter ID, the date and time of the change, and the new value of the parameter (for calibration changes consisting of multiple constants, the calibration version number may be used rather than the calibration constants). A printed copy of the information must be available through the device or through another on-site device. The event logger shall have a capacity to retain records equal to 25 times the number of sealable parameters in the device, but not more than 1000 records are required. (Note: Does not require 1000 changes to be stored for each parameter.)*
~~***Category 3a:*** *No remote capability, but operator is able to make changes that affect the metrological integrity of the device (e.g., slope, bias, etc.) in normal operation.*~~ ~~**When accessed for the purpose of modifying sealable parameters, the device shall clearly indicate that it is in the configuration mode and shall not be capable of*~~	~~*Same as Category 3*~~
~~***Category 3b:*** *No remote capability, but access to metrological parameters is controlled through a software switch (e.g., password).*~~ ~~**When accessed for modifying sealable parameters, the device shall clearly indicate that it is in the*~~	~~*Same as Category 3*~~
[1] Not allowed for devices manufactured on or after January 1, 2019 [2] Required for all devices manufactured on or after January 1, 2019	

[Nonretroactive as of January 1, 1999]
*[*Nonretroactive as of January 1, 2014]*
(Amended 1998 and 2013 and XXXX)

Background / Discussion:
During discussion of Agenda Item 5 above during the 2016 GA Sector meeting, it was suggested that the Grain Moisture Meter Code requirements for sealing be changed such that all grain moisture meters are required to meet category 3 sealing requirements as of a specific date; e.g. all grain moisture meters must have an event logger. With the increase in ease of switching out removable SD cards and making changes to metrological components it may be time to require a form of sealing that provides information on what was changed and the date of the change to the device. Category 3 sealing is currently required in NIST HB 44, Section 5.57, NIR Code. Manufacturers that were present at the meeting did not object to the proposal, but it was noted that all manufacturers were not represented at the meeting. During the 2016 GA sector meeting, Jim Truex also noted that we may need to consider State laws that require that a commercial device have a lead and wire seal. It was also mentioned that the proposed NIST, LMDP language for the general code would be redundant for the devices manufactured on or after the non-retroactive date because these meters will also require an event logger.

The current status for sealing methods of grain moisture meters are as follows:

Inactive Certificates of Conformance (CC):

- 9 inactive certificates; an inactive status for grain analyzers means that a CC was previously active for a device, but now the device is no longer being manufactured or remanufactured. Existing devices may be used, sold, or repaired and resold under inactive certificates. As such, these devices are likely still in use.
  - 3 inactive devices are *not* sealed using an event logger.

Active CC

- 9 active certificates
  - 1 active device is *not* sealed using an event logger.

The Grain Analyzer Sector members reviewed the proposed changes and provide comments and discussion on the proposed language for changes to the sealing requirements in NIST HB 44, Section 5.56(a). During the discussion States participants noted that they would rather have an event logger as it provides more information than a lead and wire seal and noted that when seals are removed no information is available to determine what changes were made to the grain moisture meter and agreed that the Category 3 method of sealing provides much more information to determine the changes made to the device. Some discussion was held on implementation with some older meters still having Category 1 sealing while others new devices would have Category 3 devices. Karl Cunningham mentioned that IL has a similar situation with NTEP and Non-NTEP meters in use in their State. Since as noted above currently, one active meter is not sealed using an event logger, the Sector recommended that additional work is needed to talk about impact of this requirement on manufacturers and to get additional feedback on an appropriate non-retroactive date for this proposed change.

7. Report on International Organization of Legal Metrology (OIML) TC 17/SC 1 R 59 *Moisture Meters for Cereal Grains and Oilseeds*

Background / Discussion:
This item is included on the Sector's agenda to provide a summary of the activities of OIML TC17/SC1 to the grain analyzer sector and to those Sector members that participate on the United States National Working Group (USNWG) on grain moisture meters.

OIML TC17/SC1 was tasked to revise OIML R 59 *Moisture Meters for Cereal Grains and Oilseeds* to reflect new technologies and actual grain analysis. The Co-Secretariats (China and the United States) worked closely with an International Project Group to revise OIML Recommendation R 59 *Moisture Meters for Cereal Grains and Oilseeds*.

As reported at the 2016 GA Sector meeting, OIML R59 would be voted on at the 51st CIML Meeting. OIML R 59 *Moisture Meters for Cereal Grains and Oilseeds* was approved at the 51st CIML meeting, held October 17-21, 2016.

Grain moisture meter manufacturers were notified by e-mail on May 9, 2017 that OIML R59 2016 was published and available on the OIML website at **www.oiml.org/en/files/pdf_r/r059-p-e16.pdf**. In this e-mail NIST OWM requested any feedback or statemen on how this standard impacts your company that can be used in NIST highlights to demonstrate the impact of our work in OIML. If you have not provided a statement or feedback please send this information to **diane.lee@nist.gov.**

During the 2017 GA Sector meeting, the Sector members were reminded that OIML R59 2016 was revised and published and available on the OIML web site and that the requirements include many U.S. requirements for evaluating grain moisture meters making it easier for U.S. manufacturers to meet the global regulations and metrological controls set for these devices. Sector manufacturers were reminded to provide any feedback on how the Standard impacts their company. For example, providing feedback on experiences with the use of the international standard.

8. Report on OIML TC 17/SC 8 *Protein Measuring Instruments for Cereal Grains and Oil Seeds*

Background / Discussion:
This item is included on the sector's agenda to provide a summary of the activities of OIML TC 17/SC 8 to the grain analyzer sector and to those Sector members that participate on the United States National Working Group (USNWG) on grain protein measuring instruments.

OIML TC17/SC8 was formed to study the issues and to develop a Recommendation on *Protein Measuring Instruments for Cereal Grain and Oil Seeds (OIML R 146).* Australia is the Secretariat for this subcommittee.

As reported at the 2016 GA Sector meeting, OIML R 146 would be voted on at the 51st CIML Meeting. OIML R 146 *Protein Measuring Instruments for Cereal Grain and Oil Seeds* was approved at the CIML meeting, held October 17-21, 2016.

Grain moisture meter manufacturers were notified by e-mail on May 9, 2017 that OIML R146 *Protein Measuring Instruments for Cereal Grain and Oil Seeds* was published and available on the OIML website at **www.oiml.org/en/files/pdf_r/r146-p-e16.pdf** . In this e-mail NIST OWM requested any feedback or statement on ho this standard impacts your company that can be used in NIST highlights to demonstrate the impact of our work in OIML. If you have not provided a statement or feedback please send this information to **diane.lee@nist.gov**.

During the 2017 GA Sector meeting, the Sector members were reminded that OIML R146 2016 was published and available on the OIML web site and that the requirements include many U.S. requirements for evaluating grain protein analyzers making it easier for U.S. manufacturers to meet the global regulations and metrological controls set for these devices. Sector members were reminded to provide any feedback on how the OIML Recommendation impacts their company. For example, providing feedback on experiences with the use of the international standard.

9. Air-Oven Grain Moisture Proficiency/Collaborative Study/Interlaboratory Comparison Testing

Source:
Grain Analyzer Sector

Purpose:
Develop an air-oven proficiency/collaborative study/interlaboratory comparison testing program to ensure state laboratory and manufacturer's air-oven measurements are traceable to the official USDA, GIPSA air-oven measurements.

Item Under Consideration:
Establish a timeline for consistent and periodic grain moisture proficiency testing.

Background/Discussion:
Under the NTEP program for grain moisture meters, calibrations are based on USDA/GIPSA air ovens while field inspection is based on State air ovens. For the program to be effective, procedures must be in place to assure that State oven results (and manufacturers' oven results) agree with the USDA/GIPSA air oven, which is, considered the standard. NIST-OWM's laboratory measurement traceability program requires that State Weights and Measures laboratories participate in interlaboratory and other collaborative experiments. State Weights and Measures programs with grain moisture laboratories typically meet this requirement by one of two methods: 1) laboratories independently send samples to GIPSA for air oven analysis, and subsequently compare their results to those obtained by GIPSA; or 2) a structured collaborative study where every laboratory, including GIPSA, measure the same sample. A structured collaborative study has at least two advantages over independent submission of samples to GIPSA by individual laboratories: 1) in addition to a check against the "standard", it provides information on how individual labs compare with each other; 2) it allows GIPSA to plan for a known work load.

A collaborative air oven study has been conducted with States and meter manufacturers periodically over a number of years and results discussed during the GA Sector meetings. These studies were conducted in 1995, 2001 and 2015.

At the 2009 NTETC Grain Analyzer Sector Meeting, Dr. Hurburgh, Iowa State University, urged the representatives from the American Oil Chemists Society (AOCS) to prepare a proposal so that the collaborative (air-oven) study could be conducted on an on-going basis rather than on an ad hoc basis. He cautioned that the proposal would have to include corn and wheat as well as soybeans and at the 2011 NTETC Grain Analyzer Sector Meeting, Ms. Johnson, AOCS, proposed an air-oven/GMM proficiency testing series designed specifically to address the needs of GMM manufacturers and states maintaining a grain moisture laboratory. The intent was for the AOCS to administer, oversee distribution of samples, compile results, perform statistical analysis of results, and distribute a report to participants. AOCS does not collect the samples. This is subcontracted to suitable providers. AOCS does not have laboratories. Since GIPSA/ FGIS is a certified laboratory already participating in the AOCS Soybean Quality Traits program, GIPSA air-oven results could be reported for comparison

At the sector's August 2012 meeting the sector learned that Ms. Christine Atkinson will be taking over the Proficiency Testing program for States and interested manufacturers formerly headed by Ms. Amy Johnson. Ms. Atkinson verified that participant's cost will remain $100 per year. The sector reiterated that the program should focus solely on the standard FGIS air-oven method. Instrument results will not be reported. Participants' air-oven results will be compared against GIPSA's standard FGIS air-oven results. In response to Ms. Atkinson's question about scheduling, the sector was in general agreement that samples should ship after harvest, preferably between mid-January and mid-February with participants' results due 30 days after the shipping date.

The sector agreed upon the following Program Details:

Samples – Soybeans 2, Corn 2, Hard Red Winter Wheat 2

- Cost to Participants - $100.00/year
- Schedule:
    - Samples (6) ship between January 15 and February 15.
    - Samples must be tested within 5 business days of receipt with results due 30 days after the shipping date.
- Reports to be posted on **www.SoybeanQualityTraits.org** by 1 May.
- Only the GIPSA oven results will be identified. Individual manufacturer's and State participant's oven results will be assigned an identifier known only to the manufacturer or State participant. Instrument results will not be reported.
- Detailed Participant Instructions will be provided to each participant.

At the August 2013 Grain Analyzer Sector meeting no report was provided on AOAC's efforts to conduct proficiency testing for grain moisture. As such, Mr. Cunningham (Illinois) and Mr. Kevin Hanson (Missouri) agreed to work together to conduct a grain moisture proficiency test. Mr. Cunningham agreed to provide the samples for proficiency testing and Mr. Hanson agreed to analyze the data in accordance with the procedures used to conduct proficiency testing in the State laboratory program. Kevin also agreed to collect data on test weight per bushel which may be useful in field test procedures for evaluating test weight per bushel on instruments. Following the August 2013 sector meeting arrangements were made for shipping grain samples to State participants.

At the August 2014 Grain Analyzer Sector meeting Mr. Cunningham provide an update on the status of proficiency testing. Mr. Cunningham informed the Grain Analyzer Sector that he collected some wheat grain samples that can be used for grain moisture proficiency testing and that corn and soybeans will be collected during the 2014 harvest. Mr. Cunningham noted that after January 2015 wheat, corn and soybeans grain samples may be ready for distribution to the participating States. Mr. Cunningham agreed to analyze the data in cooperation with NIST and requested a list of contact information for participating States and other interested parties. Proficiency testing was conducted in 2015 and reported in the 2015 Grain Analyzer Sector Report (Note: In 2015, a Grain Analyzer Sector meeting was not held but a report of activities was generated)

Recommendation:
Although the Sector has periodically conducted proficiency testing over the years, a schedule of ongoing proficiency testing is needed to ensure that these tests are performed on a consistent basis. With changes in responsibilities in AOAC and loss connections, establishing an ongoing collaborative study with AOAC may be difficult to manage. As such the Grain Analyzer Sector is asked to consider the following timeline previously discussed for sending out samples and using the guidelines for proficiency testing which includes frequency of testing included in NISTIR 7082 "Proficiency Test Policy and Plan (For State Weights and Measures Laboratories), and tools and forms for analyzing the results which are located on the NIST OWM Website at:
www.nist.gov/sites/default/files/documents/2017/05/09/nistir-7082.pdf

It is suggested that the proficiency testing be managed and oversite provided by State Weights and Measures, Grain Analyzer Sector members on a rotating basis. Per NISTIR 7082, the frequency of proficiency testing for grain moisture air oven measurements is 4 years or more often. As such the following scheduled is proposed for discussion. Please note that in addition to testing corn, soybeans and wheat the sector is asked to consider any benefits to including one specialty grain such as corn modified for high ethanol production to the proficiency testing. The schedule will be reviewed at the Sector meeting preceding the scheduled proficiency test date to confirm responsible parties and any specialty grains for inclusion in the proficiency test year. The specialty grain will change based on specific market concerns during the proficiency test year.

Air Oven Grain Moisture Proficiency Testing Schedule (Previous PTs 1995, 2001, and 2015)					
PT Test Date 4 yr. Cycle	**Sample Collection Date**	**Samples for Testing 2 of each (corn, wheat, soybeans)**	**Sample Ship Date**	**Responsible for Sample Distribution w/ Instructions**	**Responsible for Data Collection and Analysis**
Spr 2019	Spr 2018	✓	Jan/Feb 2019	IL	IL
Spr 2023	Spr 2022	✓	Jan/Feb 2023	______?	_______?
Spr 2027	Spr 2026	✓	Jan/Feb 2027	______?	_______?

During the 2017 GA Sector meeting the Sector agreed that there was no need to test specialty grain and that including these grains will not provide any useful information. The Sector decided that the three major grains, wheat, corn, and soybeans would be the grains included for proficiency testing. States and industry sector members participating in the proficiency testing were encouraged to provide their current contact information to Mr. Cunningham for sample distribution. The above table represent the schedule for proficiency testing which was edited after the 2017 Sector meeting discussion of this item.

10. The Feasibility of a Phase II program for Near Infrared Grain Analyzers

Source:
Dr. Hurburgh, Iowa State University

Background/Discussion:
The GIPSA Grain Inspection Advisory Committee recommends that GIPSA initiate research to determine the feasibility of extending the theory of "equivalency" to multiple-constituent instruments to utilize standardized technology while maintaining accuracy and consistency in measurement of wheat protein.

Ms. Eigenmann provided an update on the Grain Inspection Advisory Committee's Resolutions. The Sector discuss the feasibility of an ongoing calibration program also referred to as a Phase II program for Near Infrared Grain Analyzers (NIR) instruments that measure wheat program. The Phase II program for grain moisture is a program that monitors the moisture calibrations on grain moisture meters annually. As changes to the calibrations occur due to grains, climate, etc., data collected in this program allows for changes to moisture calibrations annually and ensure equivalency among the different moisture meter models. The Advisory committee is recommending that this program be extended to include NIR instruments that measure wheat protein. It was noted that there could be multiple NIR instruments for wheat protein introduced into the market and that it may be advisable to have the Phase II program extended to NIR instruments that measure wheat protein. It was also mentioned that currently there are few States that are checking wheat protein on multi-constituent instruments.

GIPSA currently has an annual review program for the official protein system but would have to consider the cost associated with extending the program for other NIR wheat protein analyzers. It was noted during the discussion that GIPSA currently has hourly rate fees set that could be applied to a phase II program for wheat program.

Unlike moisture where there may be changes to the calibrations annually, there will not be year to year changes for wheat protein. As such, consideration may be given to conducting the program less than annually, and considering reviewing wheat protein calibrations every 3, 4, or 5 years, as appropriate. In addition, it was noted that there also has to be a mechanism to get manufacturers calibration data for calibration review.

The sector will continue to discuss the feasibility of a phase II program for wheat protein giving consideration to the following issues:

- How the program will be funded,
- How often the calibrations for wheat protein will be updated,
- How many devices are currently being used in commercial transactions, and
- If being used commercially in a State, what is needed by States to begin testing these devices?

At the August 2014 Grain Analyzer Sector meeting USDA, GIPSA representatives provided an update on the activities concerning a phase II program for wheat protein. The Sector was informed that USDA, GIPSA is discussing funding options for this program. It was noted that the frequency of calibration for wheat protein is being considered and that this will impact the cost of the program. The Sector was also informed that Dr. David Funk is writing a discussion paper that will address many of the issues concerning a Phase II program for wheat protein.

2015 Grain Analyzer Sector Report Update:

USDA, GIPSA representatives mentioned that they are not aware of a discussion paper from Dave Funk concerning the feasibility of a Phase II program for Near Infrared Grain Analyzers. The sector should continue to provide feedback on the four bullet items listed above and USDA, GIPSA should provide any updates on any internal discussions.

2016 Grain Analyzer Sector Meeting Update

Mr Jordan (GIPSA, the NTEP Participating Laboratory for grain analyzers) provided information on some work involving applying data transforms to spectra of multiple instrument models and provided an update of these activities along with others involved in considering Phase II testing for Near Infrared Grain Analyzers.

During the 2016 Grain Analyzer Sector meeting, the sector agreed that a program is needed based on observations and some feedback from sector members that review calibration data for these instruments. As such, the sector "brain stormed" ideas on what would be needed to develop a phase II program to periodically verify the calibrations on Near Infrared devices. The sector members generated the following information based on its discussion:

Near Infrared Phase II Program Needs:

- Set of robust samples that can be used every year,
- A reference laboratory to perform the testing,
- 100 samples for all meters or less per grain type on each meter,
- The program should verify calibrations for basic grains where there is a commercially impact to included protein in wheat, soybeans, barley, and corn and oil in corn and soybeans (it was noted during discussion that there is a large economic impact in the area of wheat protein and that protein and oil in corn and soybeans are used in many non-trade applications).
- The program would currently include a total number of three instruments (There are three instruments that measure protein and oil in the NTEP program)
- Testing should include a slope bias test for each 2 point intervals and include a confidence interval.
- The current NCWM, Inc policies for participating in the grain moisture phase II testing can be used for the near infrared phase II program.
- An estimate of the cost of the program is needed. There was also a question as to whether or not the cost of the program would be distributed among the participating manufacturers, similar to the Phase II program for grain moisture.

In addition to the discussion of program needs for Phase II testing for near infrared devices, it was noted that although States test near infrared devices for grain moisture measurements, not many States are evaluating these devices for protein or other grain constituents (oil or starch). The GA Sector also discussed the needs of State weights and measures jurisdictions in testing near infrared devices for protein, starch and oil. It was noted that State resources: staff and money are needed for testing and that currently, per the States that attended the Sector meeting, commercial transactions involving protein measurements are lower than for grain moisture measurements.

Recommendation:
Sector members are asked to review the background information and list of program needs for this item in preparation for discussion on how to meet the needs for a Phase II testing program for Near Infrared Grain Analyzers.

During the 2017 Grain Analyzer Sector meeting, the Sector discussed the cost of an ongoing calibration program (Phase II Testing) for near infrared grain analyzers. Dr. Hurburgh mentioned that he is aware of continuity problems with protein and oil calibrations. It was mentioned that funding the moisture Phase II testing is handled through the interagency agreement where NIST, GIPSA, and Manufacturers contribute to funding the program.

It was noted that the largest cost will be the labor in collecting the instrument data. It was reported that 50 samples are used in the official system for near infrared meters and a monitoring system is also in place for the official system that is similar to that of the Phase II program for moisture. Dr. Hurbugh agreed to develop a Near Infrared Phase II Testing program cost analysis and share it with Ms. Brenner (USDA, GIPSA). Ms. Brenner agreed to review the cost analysis and write a proposed program for a phase II Near Infrared testing program. This information will be available for review at the 2018 Grain Analyzer Sector meeting.

11. State Weights and Measures Issues with Inspection of Grain Moisture Meters for Corn /Tolerances for UGMA meters

Source:
G. Diane Lee, NIST, OWM, Legal Metrology Device Group

Background / Discussion:
Ms. Lee received calls requesting a copy of the annual request for grain samples and list of grains that GIPSA request from States to include in the ongoing calibration program. These requests came from various States and other interested parties. One State reported seeing a difference between a UGMA meter and another meter on corn samples and wanted to ensure that grain samples in their State were represented in the ongoing calibration program.

2016 Grain Moisture Meter Sector Meeting
During the discussion of this item at the 2016 Grain Analyzer Sector meeting it was mentioned that this issue was raised when two states would not accept the new corn calibrations for grain moisture meters when they observed a difference in results for corn on different meter technologies. During the discussion, it was noted that the States that reported problems with the corn calibrations were States that have high ethanol production. It was explained that States with high ethanol production may have a high production of modified corn (corn modified to increase ethanol production). Since calibrations are based on a national sample set with grains collected from across the U.S., these modified samples may not have been included in the national sample set which could have contributed to the irregularities with the updated corn calibrations. It was suggested during the Sector meeting that modified corn samples be included in the national sample set and to monitor corn calibrations and modified corns for ethanol production. It was also noted that States should use the recommended procedures in NIST HB 44 when testing to ensure that errors are not introduced due to incorrect test procedures.

Following the discussion of this agenda item, Mr. Jeff McCluer, who had submitted an item to include on the 2016 sector agenda, that was ultimately not included on the agenda based on his request to change GIPSA tolerances, which is not in the scope of the GA Sector, presented information in reference to tolerance for UGMA meters. He explained that if the UGMA meter technology can make better measurements, he recommends that a reduction in the tolerances should be made. Charlie Hurburgh noted that the Sector has not conducted a study of the new technology and that a task force could be developed to look at the results of these meters. Charlie Hurburgh agreed to chair the task group to look at results from UGMA meters.

After some discussion with Mr. Dave Funk (Grain Quality Analytics, LLC) and some research on the tolerances for UGMA meters. At the temperature extremes errors in measurement are increased so the tolerances were set to account for an average error in these meters. As such, the task group should include a review of the measurements at varying temperature ranges.

Recommendation:
The Sector is asked to review this item and discuss specific arrangements for developing a task group to review tolerances and different technologies.

During discussion of this issue at the 2017 Grain Analyzer Sector meeting, it was suggested that different tolerances for this technology may be needed. Mr. Truex mentioned that different tolerance for technology has been considered in the past for other devices. The Sector decided to form a task group to take a closer look at field tolerances associated with UGMA meters. Mr. Hurburgh agreed to chair the work group and the following State weights and measures GA Sector members agreed to participate on the work group:

Mr. Karl Cunningham – Illinois
Mr. Randy Burns – Arkansas
Mr. Tom Hughes - Missouri

It was noted that the task group may review previous inspection data for UGMA meters for wheat and corn samples.

12. Meter to Like-Type Meter Testing and Definition of Like-Type Meter

Source:
Grain Analyzer Sector

Background/Discussion:
Following the discussion of the Items included on the 2017 Grain Analyzer Sector's 2017 Agenda, the GA Sector members were asked if there were any additional topics for discussion. A discussion on Meter to like-type meter testing and the definition of a liker-type meter followed. During the discussion test procedures for meter to like-type meter testing were requested. It was noted that there may be only about two states using this type of test method and that it may be due to the cost of obtaining like-type meters to perform the test. A question was raised as to what is considered a like-type meter and it was explained that like-type meant that the make and model were the same.

Recommendation:
Suggestions were made to include a definition for like-type in NIST HB 44 and to consider documenting test procedures for meter to like-type meter testing. Ms. Lee (NIST Technical Advisor) agreed to collect current procedures in use for review at the 2018 GA Sector Meeting.

13. Next Sector Meeting

The next meeting is tentatively planned for Wednesday, August 15 (1:00 p.m. to 5:00 p.m.) and Thursday, August 16, 2018, at the Hyatt Place at the Kansas City, Missouri Airport. Sector members are asked to hold these days open pending confirmation of availability of facility, determination of agenda items, exact meeting times, and meeting duration.

Final meeting details will be announced by early June 2018.

If you would like to submit an agenda item for the 2018 meeting, please contact any of the following persons by June 1, 2018:

Mr. Jim Truex, NTEP Administrator at **jim.truex@ncwm.net**
Ms. G. Diane Lee, NIST Technical Advisor, at **diane.lee@nist.gov**

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Appendix D

National Type Evaluation Program
Measuring Sector Annual Meeting Summary

October 3-4, 2017

INTRODUCTION

The charge of the NTETC Measuring Sector (herein after referred to as "Sector") is to provide appropriate type evaluation criteria based on specifications, tolerances, and technical requirements of NIST Handbook 44, "Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices," Sections 1.10. General Code and all portions of Section 3 including codes for Liquid Measuring Devices, Vehicle Tanks Meters, Liquid Petroleum Gas and Anhydrous Ammonia Measuring Devices, Cryogenic Liquid Measuring Devices, Milk Meters, Water Meters, Mass Flow Meters, and Carbon Dioxide Liquid Measuring Devices. The Sector's recommendations are presented to the National Type Evaluation Program (NTEP) Committee each January for approval and inclusion in NCWM Publication 14, "Technical Policy, Checklists, and Test Procedures" for national type evaluation.

The Sector is also called upon occasionally for technical expertise in addressing difficult NIST Handbook 44 issues on the agenda of National Conference on Weights and Measures (NCWM) Specifications and Tolerances (S&T) Committee. Sector membership includes industry, NTEP laboratory representatives, technical advisors, and the NTEP Administrator. Meetings are held annually, or as needed and are open to all NCWM members and other registered parties.

Proposed revisions to the handbook(s) are shown as follows: 1) deleted language is indicated with a **bold face font using ~~strikeouts~~** (e.g., **~~this report~~**), 2) proposed new language is indicated with an **underscored bold-faced font** (e.g., **new items**), and 3) nonretroactive items are identified in *italics*. There are instances where the Sector will use **red** text and/or highlighted text to bring emphasis to text that requires additional attention. When used in this report, the term "weight" means "mass."

Note: It is policy to use metric units of measurement in publications; however, recommendations received by NCWM technical committees and regional weights and measures associations have been printed in this publication as submitted. Therefore, the report may contain references to U.S. customary units.

Glossary of Acronyms

CC	Certificate of Conformance	NTETC	National Type Evaluation Technical Committee
DMS	Division of Measurement Standards	OIML	International Organization of Legal Metrology
ECR	Electronic Cash Register	OWM	Office of Weights and Measures (NIST)
EVFS	Electric Vehicle Fueling Systems	PD	Positive Displacement
HB 44	NIST Handbook 44 “Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices”	Pub 14	NCWM Publication 14
LMD	Liquid Measuring Devices	RMFD	Retail Motor-Fuel Dispenser
mA	milliamp	SI	International System of Units
NCWM	National Conference on Weights and Measures	S&T	Specifications and Tolerances
NIST	National Institute of Standards and Technology	VTM	Vehicle Tank Meter
NTEP	National Type Evaluation Program	W&M	Weights and Measures

This glossary is meant to assist the reader in the identification of acronyms used in this agenda and does not imply that these terms are used solely to identify these organizations or technical topics.

Sector Chairman, Mr. Michael Keilty, reviewed the membership list and voting rights. He also reviewed the procedures for voting, noting that the Sector typically tries to reach a consensus on issues rather than voting since there is an imbalance in the distribution of Sector membership regarding public and private sector members. Mr. Keilty also explained the organization and layout of the agenda, noting that items included “As Time Permits” are included to allow an opportunity for the Sector to share its members’ expertise with the NCWM Specifications and Tolerances Committee and other entities. At times, the Sector may reorder the agenda to address those items that could potentially need additional work during an evening session first; however, at this meeting, that did not appear to be necessary.

Carry-over Items:

1. Transfer Standards Testing - NIST HB 44 Section 3.32. LPG & NH_3 Liquid-Measuring Devices Code and Section 3.37. Mass Flow Meters Code.

Source: Mr. Michael Keilty, Endress + Hauser Flowtec AG; *[2014 NCWM S&T Item 332-2 (D)] and [2014 NCWM S&T Item 337-3 (D)] and 2015 and 2016 Measuring Sector Meetings*

Recommendation: At its 2015 and 2016 annual meetings, the Sector was asked to provide input on two proposals being developed by Mr. Michael Keilty (Endress + Hauser Flowtec AG). These items appeared on the 2014 through 2017 NCWM S&T Agendas, most recently appearing as Items 3302-1 N.3. Test Drafts (LPG & NH_3 Code) and Item 3307-1 N.3. Test Drafts (Mass Flow Meters Code).

These proposals recommend the addition of a paragraph to the "Notes" section of the LPG and Anhydrous Ammonia Liquid-Measuring Devices Code and the Mass Flow Meters Code specifying the size of the test draft when using a "transfer standard." The current proposal is outlined below:

Amend NIST Handbook 44 LPG and Anhydrous Ammonia Liquid-Measuring Devices as follows:

N.3. Test Drafts. –

N.3.1 Minimum Test - Test drafts should be equal to at least the amount delivered by the device in one minute at its normal discharge rate.
(Amended 1982 **and 2017**)

N.3.2. Transfer Standard Test. – The minimum quantity for any test draft shall be equal to or greater than the amount delivered in one minute at the flow rate being tested.

Amend NIST Handbook 44 Mass Flow Meters Code as follows:

N.3. Test Drafts. –

N.3.1 Minimum Test - The minimum test shall be one test draft at the maximum flow rate of the installation and one test draft at the minimum flow rate. More tests may be performed at these or other flow rates. (See T.3. Repeatability.)
(Amended 1982)

N.3.2. Transfer Standard Test. – The minimum quantity for any test draft shall be equal to or greater than the amount delivered in one minute at the flow rate being tested.

Background: At its 2014 meeting, the Measuring Sector was asked to discuss and comment on two proposals that were submitted to the four regional weights and measures associations in Fall 2014. These proposals would amend NIST Handbook 44, LPG and Anhydrous Ammonia Liquid-Measuring Devices and Mass Flow Meters codes, Notes Section, Test Drafts, to allow transfer standards (master meters) to test and place into service. The Sector thoroughly discussed and vetted this item. There was extensive discussion about the transfer standard (also referred to as a "master meter") itself, such as:

- The need for the master meter to be a superior standard to the meter being examined;
- Verification procedures including the proper reference weighing device's capacity and division size;
- The need to maintain control charts on the master meter;

- Frequency of re-verification for the master meter;
- The need to develop NIST Handbook 105 series specifications, test procedures, and tolerances for "master meters;"
- Development of criteria and the ability of the master meter to assure legal traceability; and
- Training staff in the correct use of master meters in field applications; etc.

The Sector agreed that transfer standards are valuable in verifying measuring systems that are not readily tested with conventional test methods. Examples include measuring systems used to measure products such as CNG, LNG, viscous products, corrosive products, and other products whose physical properties create challenges in testing. The Sector supported moving these proposals forward as "Voting" items.

At the Sector's 2015 Meeting, this issue was again discussed, and the Sector reached the following decision.

After lengthy discussion on this issue, the Sector did not reach any conclusions on this proposal to share with the submitter or with the S&T Committee. The Sector reiterated points made during its 2014 meeting (see "Background" section earlier in this item). Additionally, while the Sector does not have specific recommendations regarding the proposal, the following "observations" might be useful for further work on this issue.

- The use of master meters has particular appeal for use in testing devices such as CNG metering systems where factors such as product type, safety, environmental factors, and the availability of equipment pose special challenges.
- Use of gravimetric testing for CNG has been reported to pose challenges such as returning/disposing of product; procuring a suitable scale and test tank; and controlling environmental influences that may affect testing results.
- Field standards must comply with the general criteria in NIST Handbook 44, Appendix A, Fundamental Considerations includes general criteria for field standards.
- Recognition of transfer standards in NIST Handbook 44 does not, by itself, ensure recognition or acceptance of these devices as an acceptable test method.
- Specific types of field standards do not have to be specifically identified in NIST Handbook 44 in order for a weights and measures jurisdiction to recognize their use in testing measuring devices.
- Additional provisions must be in place to ensure traceability of measurements using a transfer standard as an official test method. Examples include documentary standards for the field standard (e.g., NIST Handbook 105 applicable to the standard); training for laboratory metrologists in the testing of the field standard; control procedures to ensure continued performance of the transfer standard; training of field staff in the use of the transfer standard; and control procedures for maintaining the master meter.
- A master meter must perform better than the meter under test.

The Sector noted that the selection of appropriate test methods for type evaluation is an issue that is often faced by NTEP evaluating laboratories. The Sector agreed that guidelines on determining an appropriate test method(s) for an evaluation would be helpful to both the laboratories and manufacturers. Several Sector members including the following expressed an interest in working together to develop such guidelines for inclusion in Publication 14:

–Marc Buttler, Emerson Process Management/Micro Motion
–John Roach, California Division of Measurement Standards
– Michael Keilty, Endress + Hauser Flowtec AG, USA
– Tina Butcher, NIST OWM

This subgroup agreed to bring any recommendations it develops back to the Sector at its 2016 meeting as a carryover item, either as part of the H44 item or as a separate item for type evaluation criteria.

At the 2015 and 2016 NCWM Interim and Annual Meetings, the S&T Committee discussed both proposals in the "Recommendation" as a single item. The Committee heard comments from the submitter along with a list of benefits to using a master meter as the standard in testing meters used in applications to measure CNG, LNG, and LPG in comparison to using volumetric or gravimetric standards. The Committee also heard many comments, which were reiterated and summarized at its 2015 Annual Meeting regarding additional issues that must be carefully considered. See the Committee's 2016 Interim Report for details on discussions leading up to the 2016 NCWM Annual Meeting. At the NCWM Annual Meeting, the S&T Committee agreed to maintain these two items as developing items to allow the submitter time to address the comments received.

At the 2016 Sector Meeting, the Sector heard an update on progress on these two S&T items. Sector Chairman, Michael Keilty (Endress + Hauser) noted that those items were previously "Voting" items on the NCWM S&T Committee's agenda, but are now "Developing" items to allow additional discussion and input to be gathered. Many comments were made at the NCWM Annual meeting regarding the proposals before the S&T Committee. Several Sector members concurred that additional development is needed, including how to establish and demonstrate a sufficient degree of accuracy in the test method. Tina Butcher noted that there was an issue regarding the presentation of proposed language in NCWM Publication 15 and 16 versus the language that was originally submitted by the submitter and noted that the S&T Committee is working with the submitter for clarification on this point. Other more technical issues with the proposal were the need to clarify the type of transfer standard being referenced and the associated error and uncertainty with the test method. Mrs. Butcher, Randy Moses (Wayne), and others noted that there did not appear to be any opposition to the concept of recognizing transfer standards, only that additional work is needed on the technical concerns that have been raised and the language before the item is ready for adoption. Marc Buttler (Micro Motion) also noted that there is still a need to address the flow rates and times referenced and commented that he had made a proposal from the floor of the NCWM to specify a time of 2 minutes at the maximum operating flow rate. Mrs. Butcher noted that an additional concern about the proposed language for the Mass Flow Meters Code is that, as currently presented, it would not allow testing of compressed natural gas metering systems at the lower flow rates in accordance with the NTEP Examination Procedure Outline for those systems.

Recommendation: The Sector is asked for any additional input that might be of assistance to the S&T Committee and the submitter in its deliberations on Items 3302-1 N.3. Test Drafts (LPG & NH_3 Code) and Item 3307-1 N.3. Test Drafts (Mass Flow Meters Code).

Discussion: Sector Chairman, Michael Keilty, reviewed the item and the proposed changes, noting that language similar to that proposed already exists in other measuring codes. The proposal has been before the NCWM for a few years to allow for additional development and input. Dmitri Karimov (LC) questioned differences in terminology in the proposal with regard to the specified timing, asking whether it means 1 minute of flow rather than 1 minute of the maximum flow rate of the meter. Mr. Keilty responded that the proposal is for a minimum quantity and the quantity could be larger during a test. Mr. Sharif discussed where topics are similar in codes and discussed later that the minimum quantity could be related to the MMQ. Rich Miller (FMC) noted that this wouldn't preclude a test using a smaller size standard. Tina Butcher (NIST OWM) shared that OWM had expressed concerns about reports that the time frame for test runs on CNG retail motor-fuel dispensers are less than one minute of flow. Mr. Keilty pointed out that the proposal would not preclude someone from using a larger standard or vessel for the test, noting that the capacity of a standard is often limited by available sizes and sometimes it is necessary to go to a larger test standard size to satisfy the requirement; for example, an LPG prover may only be made in 25-, 50-, and 100-gallon sizes. Robin Parsons (Parafour Innovations) noted that some service companies and inspectors are using trailers equipped with multiple size test standards in order to accommodate a range of meter sizes. Marc Buttler (Micromotion) pointed out that, for CNG, it may be possible to use a larger size test tank to conduct the test.

Mrs. Butcher shared an overview of comments provided by OWM to the NCWM S&T Committee during its open hearings at the last few NCWM meetings. She noted that OWM supports the concept of using master meters, but the inclusion of this or any such paragraph in NIST Handbook 44 may be premature. Additional research is needed to ensure that essential elements required to establish traceability have been developed and implemented; in the process of addressing these elements it should become clear whether a change is needed to HB44 and, if so, what that change should be. She also noted that an OWM staff member, Val Miller, will be doing some work regarding master meters used as field standards in the next year and hopes to engage interested members in the community to gather additional information that would help the Committee and the community determine what additional work is needed on this issue in order to make an appropriate decision. OWM has also proposed some changes to the terminology being used (including the term "transfer standard") to begin cleaning up the inconsistencies throughout HB 44 regarding standards. Luciano Burtini (Measurement Canada) echoed Mrs. Butcher's comments, noting a proposed change to NIST HB 44 is only one of many things to address in order to consider using a master meter.

Mr. Keilty disagreed that the proposal is premature and noted that these meters are not just for alternative fuel dispenser testing but also for loading trucks loading trucks. He also noted that, since the time that the CNG Work Group first developed the EPO for testing CNG RMFDs, tank sizes and other aspects of testing has changed. In more recent times, he has seen larger and lighter tanks used for testing, thus, eliminating the concern about the time limit being too short. He also questioned the references in the other codes, such as the Cryogenic Liquid-Measuring Devices Code, which already include references to "transfer standards" as well as an expanded tolerance for test using that equipment. He also shared frustrations (acknowledged by others) about the challenges of finding an appropriate scale and test tank to test various sizes of metering systems, particularly larger systems such as those used to load rail cars.

Mrs. Butcher also noted that OWM had received inquiries about consider the use of master meters and other alternative proving methods such as small volume provers to test products such as LPG for which gravimetric testing may be difficult or impractical and for which conventional neck-type standards are not available or where safety concerns make previously used test methods inappropriate.

The Sector also discussed how standards are maintained and cared for and many shared thoughts about how to ensure that a master meter can continue to be used as a field standard. Several commented that, unlike a weight or neck type standard where damage or variation might be visibly evident, the process of maintaining confidence in a master meter can be challenging. However, most Sector members agreed there would be a significant advantage to being able to recognize their use. Mr. Miller suggested consulting API standards, noting that they have standards and procedures in place on the use of master meters that may be of help.

Mr. Marc Buttler (Micro Motion) stated he shares the goal of expanding the use of technology to use mass flow meters as field standards but agrees there are many things that need to be addressed. He expressed concern that the requirement may be too restrictive and doesn't want to inadvertently limit the use of the technology by putting a set time into NIST HB 44 that would do that. He noted that the subsequent Sector agenda item is aimed at beginning to move in this direction for type evaluation in a way that would ensure necessary elements are in place to ensure traceability of the measurements.

Decision: There is widespread support within the Sector for use of master meters. Sector members agree that the decision on whether to permit their use for routine field testing is not up to the Sector.

2. Master Meters as an Option for NTEP Testing

Source: Emerson Process

Background Information: "Master Meters" are often considered as an option for reference standards to facilitate testing of devices during NTEP evaluation and/or field inspection. NCWM Pub 14 could provide valuable information in the form of guidance on how to ensure that master meters are properly calibrated and qualified as reference standards. Additional information about the proper use, including minimum draft size would also be valuable to add to NCWM Pub 14.

In considering other alternatives to address the problem, the submitter made note that Section I currently provides this type of information for gravimetric test methods. However, for reasons that include a need for increased safety, environmental stewardship, and immunity to ambient and weather conditions, Master Meters are a desirable alternative to weigh scales in certain applications, especially CNG dispenser testing.

The Sector initially discussed this issue in conjunction with a carryover item from the Sector's 2015 agenda regarding the development of guidance for the NTEP Laboratories to use in assessing the appropriateness of transfer standards and other alternative test methods during type evaluation testing. Mr. Buttler noted that he developed proposed criteria drawing on "essential elements of traceability" identified by NIST OWM's Laboratory Metrology Program and circulated a draft guidelines document to the Sector the night before this Sector meeting. Several members noted that they did not think that they had adequate time to review the document before commenting on it, and Mr. Keilty suggested that the document be re-distributed to other Sector members for review and comment. Mrs. Butcher suggested that the small group established at the last Sector meeting continue to work on this issue, noting that the group hadn't had the opportunity to devote much time to the issue since the last Sector meeting.

Mrs. Butcher also suggested that the Sector consider breaking out the criteria in the draft guidelines to address specific metering technologies, starting with the use of mass flow meters used as transfer standards and, once that language and associated guidelines have been adequately developed, then move on to the use of other technologies. Mr. Buttler noted that the draft guidelines he has been working on for type evaluation could also be used in routine field inspections.

At the end of the 2016 Sector meeting, Sector members were generally in support of the concept of using transfer standards for both type evaluation testing and routine field tests, but acknowledged that additional development and details are needed for both the guidelines for NTEP evaluations and the items before the NCWM S&T Committee. The Sector agreed that the draft document developed by Mr. Buttler should be reviewed by Sector members and all Sector members should provide input on the draft to the small working group established in 2015. The Sector also agreed that the small group and the NTEP laboratories should continue to work on the guidelines and present an updated draft to the Sector for review by the next Sector meeting. A draft was distributed to the Sector via the NCWM Measuring Sector List Serve following the meeting.

Immediately after the 2016 Sector meeting, Mr. Buttler formally submitted this information on a Form 15 for consideration at the next Sector Meeting.

Recommendation: The Sector is asked to consider recommending that Section I. Field Evaluation and Permanence Tests for Mass Flow Meters be modified as shown in Appendix A to this agenda.

Discussion: Marc Buttler (Emerson Process) provided an overview of this issue and highlighted the proposed changes to NCWM Pub 14. He noted the purpose of the item is to clarify that a master meter may be used for type evaluation and to establish criteria in NCWM Pub 14 under which this can be accomplished. The proposed changes do not provide specifics, but emphasize the importance of demonstrating the validity of the master meters to be used. Another section was added to define what would be needed in lieu of a test conducted at an ISO 17025 accredited testing laboratory. For example, requiring witness-testing of the master meter's calibration in the laboratory. There was some additional discussion about the type of meters and the testing that would be required on the meters to allow their use as a master meter. Mr. Luciano Burtini and Mr. Farhad Sharifi (Measurement Canada) noted that Measurement Canada often use meters for testing purposes that don't meet requirements for commercial metering applications, but which have been demonstrated to meet necessary performance requirements and other criteria for use as a master meter; sometimes they even build scales to meet the needs for testing when such scales aren't commercially available. Tina Butcher (NIST OWM) commented that it is also necessary to consider the product used to test the meter in the laboratory and to ensure that it is appropriate to demonstrate performance on the product used in field testing. Mr. Keilty also questioned if additional criteria are needed on the selection of the right size for the meter to be used. Mr. Buttler noted the importance of demonstrating that you have taken into account all the uncertainties in your measurements.

The Sector also discussed extending the use of this criteria such that meter technologies in addition to mass flow meters might be used. Mr. Dmitri Karimov (Liquid Controls) commented he would like to see this cover other meter types and suggested locating the criteria in a section of the checklist such that it would apply to all meter types. Mr.

Buttler suggested not creating a separate section at this point. Instead, he suggested first having the laboratories use the criteria and modify it as needed to address other applications. There was general agreement with this approach, including industry as well as Mr. Joe Eccelston (Maryland) and Mr. Allen Katalinic (North Carolina), representing the NTEP laboratories. Mrs. Butcher suggested the criteria outlined in the Family of Products Table might be consulted to help identify key characteristics that might influence a given meter type as the criteria are expanded to other meter technologies. Mr. Karimov noted that the key is being able to demonstrate that the calibration hasn't changed when measuring different products. Mr. Buttler agreed that, if you can demonstrate a meter *type* is not affected by a change in fluid type, you should be able to use that meter with multiple fluids.

During its initial discussion of this item, the Sector agreed with the proposal, with the following modifications to Section I:

(1) Modify the first paragraph to clarify that the criteria apply to mass flow meters used as master meters since that is how the criteria were developed.

> Alternatively, transfer standard **mass** meters (master meters)….

(2) Modify the first main bullet under "Transfer Standard Meter (Master Meter) Qualification:

> "…equal to 1/3 of the tolerance allowed for the device ~~**in service**~~ that is to be tested."

(3) Modify the third sub-bullet:

> "the uncertainty of the calibrated master meter **over the entire flow range** stated in the Scope of Accreditation."

(4) Modify the fourth sub-bullet:

> "…the measurement procedures **and fluid(s)** used to calibrate the master meter."

(5) Modify the paragraph starting with "When the master meter….":

> "When the master meter **type** has been shown through testing against traceable standards to have the same calibration configuration values between ~~**liquid and gas, the calibration may be done on either liquid or gas, regardless of whether the master meter will be used as a liquid or a gas transfer standard during field evaluation testing**~~ **the master meter calibration fluid and the fluid for the test meter, testing may be done using the test fluid without adjustment to the master meter."**

Mr. Buttler and rs. Butcher were tasked with working overnight on the language and printing the revised proposal for review by the Sector on the second day of the meeting.

During discussions the second day of the meeting, there was disagreement with specific language regarding meter calibration factors used for the original meter test liquid and the liquid used in the meter under test. Mr. Keilty expressed concerns over saying that the master meter must have the same value. Mr. Buttler recommended (and others agreed with) striking that paragraph so that the rest of the proposal can advance.

Decision:* *After discussing and making additional revisions to the proposal, the Sector agreed to recommend inserting the proposed changes into NCWM Publication 14 as outlined in Appendix A to this summary.

The Sector is open to discussing proposals to add similar criteria to Publication 14 to address other types of metering technologies. Such a proposal could recommend adding similar criteria to those specific sections addressing other metering technologies. Alternatively, the proposal could be to pull the criteria out of Section I and create a separate section that addresses the use of master meters for all types of meters. Anyone interested in pursuing such a

proposal needs to submit a Form 15 outlining the proposal prior to the deadline for submitting agenda items to the Sector.

3. LMD & VTM Codes - Verification of Linearization Factors (S&T 330-3 and S&T 331-4)

Source: Carryover Item from 2016 Measuring Sector Meeting

Background: At its 2016 Annual Meeting, the NCWM adopted the following changes to the LMD Code and the VTM Code to add a test note pertaining to the testing of metering systems using linearization factors. A corresponding user requirement was added to each code to describe the user's responsibilities when making adjustments to systems with these capabilities.

LMD Code:

N.4.5. Verification of Linearization Factors. - All enabled linearization factors shall be verified. The verification of enabled linearization factors shall be done through physical testing, or a combination of physical testing and empirical analysis at the discretion of the official with statutory authority.

VTM Code:

N.4.6. Verification of Linearization Factors. - All enabled linearization factors shall be verified. The verification of enabled linearization factors shall be done through physical testing, or a combination of physical testing and empirical analysis, at the discretion of the official with statutory authority.

The submitter of these items also worked with a group of experts in the community to develop a document providing guidance on conducting an empirical analysis and presented the document to the S&T Committee for consideration. A copy of this document was included in Appendix C to the Sector's 2016 meeting summary and is titled "Guidance on Empirical Analysis." Comments received suggested getting additional input from the community on the guidance document, including input from the Measuring Sector, and providing the final document to NIST for incorporation in metering Examination Procedure Outlines as appropriate.

At its 2016 meeting, the Sector was asked to discuss whether additional criteria are needed for addition to NCWM Pub 14 with regard to the evaluation of systems including linearization factors, possibly in the Field Evaluation and Permanence Testing for Metering Sections of the LMD Checklist as outlined below.

Presently the only references in the checklist regarding linearization are a reference to the inclusion of multi-point calibration capability as a feature on a CC where applicable (See Technical Policy Section A. Type Evaluation Test Location, Installations Criteria, and Certificate of Conformance) and Technical Policy Section G. Range of Data Points (see below).

F. Range of Data Points

The number and types of tests to be run on devices covered under this checklist are specified in the Checklist and Test Procedures section and the Field Evaluation and Permanence Tests for Metering Systems section of this checklist. However, if the NTEP laboratory feels that there is a performance or other *NIST Handbook 44* related problem and provides reasons to support this belief, the laboratory is given the latitude to require additional testing.

A measuring element may use factory-established linearization curves to establish the minimum flow range (5:1, 10:1, or as required), providing the linearization programming is installed during manufacturing and the programming cannot be altered after leaving the factory.

Auxiliary equipment (e.g., indicator or register) with programmable multi-point calibration that alters the output signal from the measuring element to extend the flow range of the system beyond the measuring element's required minimum flow range may be used and the auxiliary device's multi-point calibration will

be noted on the Certificate of Conformance and must be marked on the meter.

The Sector was also asked to review the guidance document "Guidance on Empirical Analysis" and provide input on its contents.

The Sector acknowledged that the guidelines were developed for use in routine field testing rather than for type evaluation and that the criteria might be useful to include in relevant NIST EPOs. Some members suggested that a clear explanation of how to translate a meter factor into a meter error so that officials are able to appropriately assess the result of different meter factors through the flow range of a system would be useful, and the Sector suggested that additional explanation be provided in the guidance document regarding how to compare meter factors. Individual Sector members were also encouraged to provide comments on the guidance document to the Technical Advisor and to the Chairman of the Work Group that developed the document.

Several NTEP Laboratory representatives commented that it would be beneficial to have something in Publication 14 to describe how to handle multi-point calibration capability during type evaluation. Several Sector members noted that there are differences in how various systems and technologies handle linearization. Rich Miller (FMC) shared a copy of Measurement Canada's Approval Procedure for Linearization Functions Incorporated in Measuring Instruments and suggested that the Sector consider this in its assessment. He expressed concern about how poor performance of a particular meter could reflect negatively on the performance of an indicator. Mrs. Butcher noted that there are two issues for the Sector to consider: (1) The group that developed the guidance document *for use in routine field testing* submitted to the NCWM in July 2016 would appreciate feedback from people with expertise in metering systems, particularly the Measuring Sector members; and (2) There appears to be a need to further define/document how linearization capability is addressed in type evaluation with regard to how the feature will be evaluated so that there is consistency among type evaluations.

At the conclusion of the Sector's 2016 discussions on this item, Sector members were asked to review the guidelines presented by the small working group that presented the draft guidelines to the NCWM and provide input as it applies to field testing.

The Sector agreed that more definitive criteria is needed in Publication 14 to define how linearization factors are to be addressed during type evaluation. The labs currently address this feature in the same way, but agree it needs to be documented.

The Sector acknowledged that there is a document from Measurement Canada that could form the basis for these criteria. The Sector also noted that there is a draft checklist for indicators that is close to completion and that this type of criteria might be included in that document. Several members volunteered to work on finalizing this checklist and including criteria for evaluating indicators with linearization features.

The following members agreed to work on this project:

- Mr. Rich Miller (FMC)
- Mr. Allen Katalinic (North Carolina)
- Mr. Joe Eccleston (Maryland)

Mr. Miller and Mr. Katalinic agreed to co-chair the group. Others who are interested in working on this are encouraged to contact Allen.

The Sector agreed that this item should be included as a carryover item and that this group will work on finalizing the electronic indicators checklist, including additional guidance on linearization features.

Recommendation: The Sector will hear an update on the status of this work. Individual Sector members are asked to share any observations or suggestions that would be of help to this work.

Discussion: The Sector briefly discussed this issue. Mr. Katalinic reported that the small group has not done any additional work because no devices on which to try out the criteria were subsequently submitted for evaluation. Mr. Miller commented that the purpose of this criteria was to provide more procedures to assist the laboratories in their evaluations. This is the reason he recommended considering Canada's procedures as a starting point. Mr. Katalinic commented that he can continue using the existing NCWM Pub 14 criteria and Joe Eccelston (MD) agreed that he would do the same, noting that this type of device doesn't frequently come up for evaluation.

Decision: The NTEP Laboratories think that they have sufficient guidance regarding the use of linearization features. The guidance document developed by the subgroup could be used as an interim set of guidelines. If additional criteria are needed the Sector agreed to revisit the issue at that point and establish more specific criteria than is currently in NCWM Pub 14. With regard to the checklist for electronic indicators, since there have not been any submissions of indicators on which to apply the draft checklist, the Sector agreed to drop this portion off its agenda until such time that the checklist can again be tried out.

New Items:

4. Recommendations to Update NCWM Pub 14 to Reflect Changes to NIST HB 44 and Other Proposed Changes.

Source: NCWM S&T Committee

Background:
At its 102nd NCWM Annual Meeting, they adopted the following items that will be reflected in the 2018 Edition of NIST Handbook 44. These items were included on the Sector's agenda to inform the Measuring Sector of the NCWM actions and to recommend corresponding changes to NCWM Publication 14. For additional details on these items, refer to the NCWM S&T Committee's 2017 Interim Report and its accompanying appendix, which can be found on the NCWM's web site at: **www.ncwm.net/meetings/interim/archive#2017**

In the process of preparing these updates, Technical Advisor, Tina Butcher, also identified several other discrepancies and inconsistencies, including editorial changes needed to the checklist. Recommendations on these changes are also included under this item.

A. Vapor Elimination – Multiple Measuring Codes

Background: At the 2017 NCWM Annual Meeting, the NCWM adopted the following changes to the LMD Code; VTM Code; Milk Meters Code; Water Meters Code; and Mass Flow Meters Code:

LMD Code: (S&T Item 3300-1)

S.2. Measuring Elements.

S.2.1. Air/Vapor Elimination. -

~~**(a)**~~ A ~~**liquid-measuring device**~~ **measuring system** shall be equipped with a**n effective** ~~**vapor or**~~ air**/vapor** eliminator or other automatic means to prevent the passage of ~~**vapor and**~~ air**/vapor** through the meter.

~~**(b)**~~ Vent lines from the air ~~or~~ /vapor eliminator shall be made of ~~**metal tubing or other rigid**~~ **appropriate non-collapsible** material.

(Amended 1975 **and 2017**)

S.2.1.1. Air/Vapor Elimination on Loading Rack ~~Metering~~ Measuring Systems

(a) A loading rack ~~**metering**~~ **measuring** system shall be equipped with ~~**a vapor or air**~~ **an effective air/vapor** eliminator or other automatic means to prevent the passage of **air/**vapor and air through the meter unless the system is designed or operationally controlled by a **means** ~~**method, approved by the weights and measures jurisdiction having control over the device,**~~ such that air/~~**and/or**~~ vapor cannot enter the system.

(b) Vent lines from the air ~~or /~~vapor eliminator **~~(if present)~~** shall be made of **~~metal tubing or other rigid~~** **appropriate non-collapsible** material.

(Added 1994) **(Amended 2017)**

VTM Code:

(S&T Item 3301-1)

S.2. Design of Measuring Elements.

S.2.1. Air/Vapor Elimination. – A **~~metering~~** **measuring** system shall be equipped with an effective **~~vapor or~~** air/**vapor** eliminator or other automatic means to prevent the passage of **~~vapor and~~** air**/vapor** through the meter. Vent lines from the air **~~or~~/**vapor eliminator shall be made of **~~metal tubing or some other suitable rigid~~** appropriate non-collapsible material.

(Amended 1993) (Amended 2017)

Milk Meters Code:

(S&T Item 3305-1)

S.2.1. Air/Vapor Elimination. – A **~~metering~~** **measuring** system shall be equipped with an effective **air/**vapor eliminator or other **~~effective means~~** automatic **means** **~~in operation~~** to prevent the passage of **air/**vapor **~~and air~~** through the meter. Vent lines from the air **~~or~~/**vapor eliminator shall be made of **~~metal tubing or some other suitably rigid material~~** **appropriate non-collapsible material**.

(Amended 2017)

Water Meters Code:

(S&T Item 3306-1)

S.2.2. Batching ~~Meters~~Measuring Systems Only.

S.2.2.1. Air/Vapor Elimination, Batching Measuring Systems. – Batching **~~meters~~measuring systems** shall be equipped with an effective air**/vapor** eliminator **or other automatic means to prevent the passage of air/vapor through the meter. Vent lines from the air/vapor eliminator shall be made of appropriate non-collapsible material.**

(Amended 2017)

Mass Flow Meters Code:

(S&T Item 3307-1)

S.3.3. Air/Vapor Elimination. – A **~~liquid-measuring instrument or~~** measuring system shall be equipped with an effective **air**/vapor **~~or air~~** eliminator or other **~~effective~~** **automatic** means**~~, automatic in operation,~~** to prevent the measurement of **air**/vapor. Vent lines from the air/~~or~~ vapor eliminator shall be made of **~~metal tubing or some other suitable rigid~~** **appropriate non-collapsible** material.

(Amended 1999 **and 2017**)

S.3.3.1. **Air**/Vapor Elimination on Loading Rack Liquid **~~Metering~~** **Measuring** Systems.

(a) A loading rack **~~liquid metering~~** **measuring** system shall be equipped with a**n effective air/**vapor **~~or air~~** eliminator or other automatic means to prevent the passage of **air**/vapor **~~and air~~** through the meter, unless the system is designed or operationally controlled by a **means** **~~method, approved by the weights and measures jurisdiction having statutory authority over the device,~~** such hat neither air nor vapor can enter the system.

(b) Vent lines from the air/ **or** vapor eliminator ~~**(if present)**~~ shall be made of ~~**metal tubing or other rigid**~~ **appropriate non-collapsible** material.

(Added 1995) **(Amended 2017)**

Recommendation: The Sector is asked to consider the following proposed changes to NCWM Publication 14 to correspond with the changes to Handbook 44 relative to "vapor elimination" that were adopted by the NCWM in July 2017.

Proposed Changes to NCWM Publication 14 to Reflect Changes Adopted by the NCWM in July 2017: Vapor Elimination

Liquid-Measuring Devices Checklist, Checklist and Test Procedures for Common Specific Code Requirements
Page LMD-32:

1. Measuring Elements

Code Reference: S.2.1. Vapor Elimination (LPG S.2.1.)

If air**/vapor** enters ~~**through**~~ a ~~**metering**~~ **measuring** system or the product changes into **the** vapor **state** as it passes through the system, then ~~**it**~~ **the system** must be equipped with a**n effective air/**vapor eliminator **or other automatic means** to ~~**remove**~~ **prevent** the air ~~**or**~~ **/**vapor ~~**before it passes**~~ **from passing** through the meter. To prevent the vapor eliminator vent lines from being pinched closed and re-opened without being detected, the vent lines shall be made of ~~**metal tubing or other**~~ appropriate non-collapsible material. If the system is designed such that air ~~**or**~~ **/**vapor will not enter the system, then a**n air/**vapor eliminator is not required. One example is when a product is being pumped from the bottom of a tank and a low-level detector in the tank shuts off the pump before the liquid level gets to the point where air could enter the system. ~~**Code Reference: S.1.5.1. Symmetry**~~

6.1 The metering system is equipped with an effective **air/**vapor eliminator.	☐ Yes ☐ No ☐ N/A
6.2 The vent lines are made of ~~**metal tubing or some other**~~ appropriate non-collapsible material **to prevent the lines from being pinched closed and re-opened without being detected**.	☐ Yes ☐ No ☐ N/A
6.3 The vent lines are made of ~~**metal tubing or some other**~~ appropriate non-collapsible material **to prevent the lines from being pinched closed and re-opened without being detected**.	☐ Yes ☐ No ☐ N/A

Checklist and Test Procedures for Wholesale and Loading-Rack Meters

Page LMD-54

17. Measuring Elements

Code Reference: S.2.1.1. Vapor Elimination on Loading Rack Metering Systems

A loading rack ~~**metering**~~ **measuring** system shall be equipped with a**n effective** ~~**vapor or air**~~ **air/vapor** eliminator or other automatic means to prevent the passage of ~~**vapor and air**~~ **air/vapor**	☐ Yes ☐ No

through the meter. This is unless the system is designed or operationally controlled by a ~~**method that is approved by the weights and measures jurisdiction, which the device controls**~~ **means** such that air ~~**and**~~/or vapor cannot enter the system. (Several guidelines, not intended to be all-inclusive for evaluation of a loading rack metering system in which an air eliminator is not needed were adopted by NCWM in July of 1995. ~~**The guidelines are intended to be incorporated in the next edition of *NIST Publication 12*, EPO Number 25**~~). ☐ N/A

17.1. The metering system is equipped with an effective air/vapor eliminator. ☐ Yes ☐ No ☐ N/A

17.2 Other effective, automatic means are provided to prevent air/vapor from passing through the system. Describe the means provided and list this information on the Certificate of Conformance: ☐ Yes ☐ No ☐ N/A

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____

17.~~2.~~3. Vent lines from the ~~**air or vapor**~~ **air/vapor** eliminator ~~**(if present)**~~ shall be made of ~~**metal tubing or some other rigid**~~ **appropriate non-collapsible** material **to prevent the lines from being pinched closed and re-opened without being detected**. ☐ Yes ☐ No ☐ N/A

Renumber subsequent checklist items.

Checklist and Test Procedures for Mass Flow Meters

Page LMD-78 to LMD-79

Modify Section 34 to reflect changes to paragraph S.3.3. Vapor Elimination and to move references to S.3.5. Provision for sealing into a separate code reference for clarity, renumbering subsequent checklist paragraphs/sections.

34. Measuring Elements

Code Reference: ~~S.3.5. Provision for Sealing and~~ S.3.3. Vapor Elimination

~~**Measuring elements shall be designed with adequate provisions to prevent changes from being made to the measuring element or the flow rate control (if the flow rate control affects the accuracy of deliveries) without evidence of the change being made. These provisions can be an approved means of security (e.g., data change audit trail) or physically applying a security seal which must be broken before adjustments can be made. When applicable, the adjusting mechanism shall be readily accessible for the purposes of affixing a security seal.**~~ **If air/vapor enters a measuring system or the product changes into the vapor state as it passes through the system, then the system must be equipped with an effective air/vapor eliminator or other automatic means to prevent the air/vapor from being measured by the meter. To prevent vapor eliminator vent lines from being pinched closed and re-opened without being detected, the vent lines shall be made of ~~metal tubing or other~~ appropriate non-collapsible material. If the system is designed such that air/vapor will not enter the system, then an air/vapor eliminator is not required. One example is when a product is being pumped from the bottom of a tank and a low-level detector in the tank shuts off the pump before the liquid level gets to the point where air could enter the system.**

34.1. A mass flow metering system shall be equipped with a vapor or air eliminator or other automatic means to prevent the ~~passage of~~ **measurement of** vapor or air ~~**through**~~ **by** the meter. ☐ Yes ☐ No ☐ N/A

34.2. **Other effective, automatic means are provided to prevent air/vapor from passing through or being measured by the system. Describe the means provided and list this information on the Certificate of Conformance:** ☐ Yes ☐ No ☐ N/A

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34.3. Vent lines from the ~~air or vapor~~ **air/vapor** eliminator ~~(if present)~~ shall be made of ~~metal tubing or some other rigid~~ **appropriate non-collapsible** material to prevent the lines from being pinched closed and re-opened without being detected. ☐ Yes ☐ No ☐ N/A

Code Reference: S.3.5. Provision for Sealing

Measuring elements shall be designed with adequate provisions to prevent changes from being made to the measuring element or the flow rate control (if the flow rate control affects the accuracy of deliveries) without evidence of the change being made. These provisions can be an approved means of security (e.g., data change audit trail) or physically applying a security seal which must be broken before adjustments can be made. When applicable, the adjusting mechanism shall be readily accessible for the purposes of affixing a security seal.

34.4. A measuring element shall have provision for either…

Renumber subsequent checklist paragraphs/sections.

Additional Checklist and Test Procedures for Water Meters

Page LMD-93

44. Batching Meters Only

Code Reference: S.2.2.1. Air/Vapor Elimination, Batching Measuring Systems.

If air/vapor enters a measuring system or the product changes into the vapor state as it passes through the system, then the system must be equipped with an effective air/vapor eliminator or other automatic means to prevent the air/vapor from being measured by the meter. To prevent vapor eliminator vent lines from being pinched closed and re-opened without being detected, the vent lines shall be made of ~~metal tubing or other~~ appropriate non-collapsible material. If the system is designed such that air/vapor will not enter the system, then an air/vapor eliminator is not required. One example is when a product is being pumped from the bottom of a tank and a low-level detector in the tank shuts off the pump before the liquid level gets to the point where air could enter the system.

44.1 ~~Batching meters shall be~~ **The metering system is** equipped with an effective air**/vapor** eliminator. ☐ Yes ☐ No ☐ N/A

44.2 **Other effective, automatic means are provided to prevent air/vapor from passing through the system. Describe the means provided and list this information on the Certificate of Conformance:** ☐ Yes ☐ No ☐ N/A

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44.3 **Vent lines from the air or vapor air/vapor eliminator (if present) shall be made of** ~~metal tubing or some other rigid~~ **appropriate non-collapsible material to**

<u>prevent the lines from being pinched closed and re-opened without being detected.</u>	☐ Yes ☐ No ☐ N/A

<u>Field Evaluation and Permanence Tests for Metering Systems</u>

<u>Page LMD-122</u>

J. Testing of Lubricating Oil Meters

Lubricating oil meters are to be tested as follows using a specially designed small volume prover for small meters or using gravimetric test methods for all sizes of meters.

Avoid recirculating product during the testing process; recirculation can cause aeration of the product and create changes in product temperature. The Certificate of Conformance is to specify that effective **<u>automatic</u>** means must be provided in the installation to prevent the introduction of air**<u>/vapor</u>** into the meter **<u>or, in the case of a mass flow meter, prevent the air/vapor from being measured</u>**.

Discussion: Technical Advisor, Mrs. Tina Butcher, reviewed the proposed changes, noting they are proposed to reflect changes made to NIST Handbook 44 in July 2017. The Sector agreed with the proposed changes; however, several meter manufacturers suggested that the reference to "rigid metal tubing" be deleted to avoid any confusion or implication that the lines must be made of metal. The Sector agreed there are other appropriate materials besides metal that would be suitable to help prevent the vent line from being restricted.

Decision: The Sector agreed to delete references to "rigid metal tubing" that appeared in the original recommendation presented to the Sector; these modifications have been incorporated in the recommendation above. The Sector agreed to recommend that the remaining proposed changes be incorporated into NCWM Publication 14.

B. VTM Code: S.5.7. Meter Size

Background: At the 2017 NCWM Annual Meeting, the NCWM modified the VTM Code to delete the required marking for meter size as follows:

S.5.7. Meter Size. – Except for milk meters, if the meter model identifier does not provide a link to the meter size (in terms of pipe diameter) on an NTEP Certificate of Conformance, the meter shall be marked to show meter size.
[Nonretroactive as of January 1, 2009]
(Added 2008)

Recommendation: The Sector is asked to consider the following proposed changes to NCWM Publication 14 to correspond with the deletion of paragraph S.5.7. as adopted by the NCWM in July 2017.

<u>LMD Checklist, Checklist and Test Procedures for RMFDs:</u>

<u>Page LMD-62</u>

Delete Code Reference S.5.7. Meter Size as follows:

~~**Code Reference: S.5.7. Meter Size**~~

<u>32.20.</u>	~~Except for milk meters, if the meter model identifier does not provide a link to the meter size (in terms of pipe diameter) on an NTEP~~	~~☐ Yes ☐ No ☐ N/A~~

~~Certificate of Conformance, the meter shall be marked to show meter size.~~

Discussion: Technical Advisor, Tina Butcher, reviewed the proposed changes, noting they are proposed to reflect changes made to NIST Handbook 44 in July 2017. The Sector agreed with the proposed changes.

Decision: The Sector agreed to recommend that the proposed changes be incorporated into NCWM Pub 14.

C. MFM Code Paragraph S.4.1. Diversion of Measured Product

Background: In reviewing the changes outlined under Item 2A, Technical Advisor, Tina Butcher, noted that under Section 35. Discharge Lines and Discharge Line Valves in the Checklist and Test Procedures for Mass Flow Meters, the term "vapor" rather than "product" (as it appears in NIST Handbook 44 MFM Code Paragraph S.4.1.) is used in the code reference. The Technical Advisor researched past editions of NCWM Publication 14 and found that this terminology has been in place at least since the 1990s. A search of Measuring Sector summaries as early as 1994 revealed no Sector action that would have intentionally made this change. Note that Mass Flow Meters may be used in applications measuring liquid or vapor; thus, the term "product" would be universally applicable to either application.

Recommendation: The Sector is asked to consider recommending the word "vapor" be replaced with "product" in Section 35 as outlined below to correct the erroneous reference to NIST HB 44 MFM Paragraph S.4.1. Diversion of Measured Product

Page LMD-80

35. Discharge Lines and Discharge Line Valves

Code Reference: S.4.1. Diversion of Measured ~~Vapor~~Product

To prevent fraudulent practices, it shall not be possible to divert measured **~~vapor~~** **product** from the measuring chamber or the discharge line of a device.

A device may have two or more delivery outlets if there are automatic means to insure that:

a. **~~Vapor~~** **Product** can flow from only one outlet at a time. **AND**

b. The direction of **~~vapor~~** **product** flow is definitely and conspicuously indicated.

35.1. Except as identified above, it shall not be possible to divert measured **~~vapor~~** **product** from the measuring chamber or the discharge line of the device.	☐ Yes ☐ No ☐ N/A

Discussion: Sector Technical Advisor, Tina Butcher, introduced the proposal and noted that she found this apparent error in the process of updating NCWM Pub 14 for the changes adopted to HB 44 in 2017 relative to vapor elimination. Mrs. Butcher believes the term "vapor" was included in error. Since the term differs from that in the corresponding NIST Handbook 44 Code reference, she recommended it be changed to match HB 44. There was little additional discussion on this item.

Decision: The Sector agreed to recommend the proposed changes be incorporated into NCWM Pub 14 as written.

D. Section J. Testing of Lubricating Oil Meters, Field Evaluation and Permanence Tests for Metering Systems

Background: In reviewing the changes outlined under Item 2A, Technical Advisor, Tina Butcher, noted that in the Field Evaluation and Permanence Tests Metering Systems, Section J. Testing of Lubricating Oil Meters, the following note regarding air elimination appears to erroneously use the term "viscous liquids" rather than "less viscous liquids" in the last sentence. This note is found at the end of Section J, on page LMD-125 of the LMD Checklist.

> *Note: When a single meter is used to deliver various products with a range of viscosities or densities, performance tests should be made at least with the products of the extreme densities or viscosities. It should also be noted that air elimination becomes much more critical than with viscous liquids.*

Recommendation: The Sector is asked to consider whether the note should read as follows and, if so, recommend changes to this note in the 2018 edition of NCWM Publication 14 as follows:

> *Note: When a single meter is used to deliver various products with a range of viscosities or densities, performance tests should be made at least with the products of the extreme densities or viscosities. It should also be noted that air elimination becomes much more critical than with **less** viscous liquids.*

Discussion: Sector Technical Advisor, Tina Butcher, introduced the proposal and noted that she found this apparent error in the process of updating NCWM Pub 14 for the changes adopted to HB 44 in 2017 relative to vapor elimination. The Sector agreed that the language currently in NCWM Pub 14 is not correct; however, the Sector preferred to delete the word "than" instead of adding the word "less" to correct the error.

Decision: The Sector agreed to modify the last sentence of the note at the end of Section J, page LMD-125 as follows:

> ***Note: When a single meter is used to deliver various products with a range of viscosities or densities, performance tests should be made at least with the products of the extreme densities or viscosities. It should also be noted that air elimination becomes much more critical ~~than~~ with viscous liquids.***

5. Flow Rates Used in NTEP Testing

Source: Allen Katalinic (NCDA & CS, NC NTEP Laboratory)

Purpose: This would eliminate the manufacturers of liquid measuring devices expanding the minimum flow rates beyond the capability of the measuring element with the aid of the special tolerance formula. Mass meter technology is not afforded this option.

Recommendation: Modify NTEP Technical Policy Paragraph B. Tolerance Applications, Normal Test Tolerances as follows:

Normal Test Tolerances
For the purposes of calculating tolerances, normal tests conducted in an NTEP evaluation ~~may~~ shall be performed at any flow rate down to **the minimum flow rated on the meter:**
~~[50% of the rated maximum flow rate + the rated minimum flow rate]/2~~

~~For example: For a meter with a rated maximum flow rate of 60 gallons/minute (gpm) and a minimum flow rate of 12 gpm, the maximum discharge rate developed in an actual installation may be as low as 30 gpm.~~

~~Therefore, for NTEP tests, calculate the "breakpoint" between normal and special tests as:~~

~~[(50% x 60) + 12]/2 = 21~~

~~Thus, in the example, NTEP test runs at flow rates between 60 and 21 gpm are considered normal tests.~~

Background Information: NIST Handbook 44 addresses the need for special test when evaluating a device **and** any special elements **and** accessories associated with the device. NIST Handbook 44, General Code Paragraph G-T.1. (e) (shown below for reference) should always be applied for all devices and technologies under evaluation.

G-T.1. Acceptance Tolerances. – Acceptance tolerances shall apply to equipment:

(a) to be put into commercial use for the first time;

(b) that has been placed in commercial service within the preceding 30 days and is being officially tested for the first time;

(c) that has been returned to commercial service following official rejection for failure to conform to performance requirements and is being officially tested for the first time within 30 days after corrective service;

(d) that is being officially tested for the first time within 30 days after major reconditioning or overhaul; and

(e) undergoing type evaluation.

(Amended 1989)

In considering possible reasons against the proposal, the submitter notes that there may be strong opposition from some manufacturers to the proposed change. As an NTEP evaluator he has witnessed performance from meters that would not have passed the evaluation without applying the special tolerance values.

Discussion: Sector Chairman Michael Keilty introduced the item and asked for input from Mr. Allen Katalinic (North Carolina), submitter of the item. He explained his rationale and noted that there appear to be inconsistencies between this reference and HB 44. The Sector discussed the application of tolerances at some length and several manufacturers commented on the influences that can affect meter performance in field testing, including the impact that inspection procedures can have on the results. Mr. Rodney Cooper (Brodie International) noted (and Mr. Rich Miller and Mr. Randy Moses concurred) that a meter that has been in the field for many years may no longer be able to meet a tight tolerance if only using single point calibration, particularly at the lower end of the flow rate where the meter isn't intended to be frequently used. There was some discussion of when special tolerances apply and several members noted there are some instances (such as retail motor-fuel dispensers) where a special tolerance is not applicable.

Decision:* *After hearing comments from the manufacturers and others, Mr. Allen Katalinic (the submitter) agreed to withdraw the item from the Sector's agenda. Mr. Katalinic indicated he heard some good arguments for this issue and will consider whether he wants to ask that the corresponding proposal be withdrawn from the agendas of the regional weights and measures associations.

6. Laboratory and Field Evaluation – Clarification of Language

Source: NTEP Laboratories

Background Information: The NTEP evaluators have experienced confusion when interpreting the "laboratory or Field Evaluation: section of the LMD checklist (see Page LMD-111). It appears to some as it applies to a field inspector, not an NTEP evaluator. The labs offer the following clarification changes.

Recommendation: Amend the **Laboratory or Field Evaluation** section of NCWM Pub 14 Measuring Devices (Page LMD-111) as follows:

Laboratory or Field Evaluation

When evaluating electronic indicators submitted separate from a measuring element, simulated inputs (e.g. meter pulse, temperature, pressure, density, communications, etc.) may be used as follows:

· For the initial testing of the indicator.

· For software changes to a device with an existing CC.

Measuring systems, devices, and elements whose performance may change with use over time are generally subject to field evaluation and permanence tests.

The following types of devices and elements are subject to ~~a subsequent field evaluation after the~~ initial field or laboratory evaluation:

· Electronic Indicating Elements

· Consoles

· Recording Elements

· Electronic Cash Registers

· Data Processing Units

Field examination is conducted between 20 and before 30 days of use in a normal installation. During this interval, the device must perform and function correctly and not be serviced. Permanence tests are conducted on equipment such as a complete measuring system or only a measuring element (meter.)

The permanence test is not required in either new evaluations or updating a CC for the electronic devices listed above in stationary installations. The permanence test for mobile electronic devices may be waived by NTEP for updating a CC.

~~**Vapor Recovery Options**~~

~~**If a retail motor fuel dispenser includes a vapor recovery option, the following statement will be included on the Certificate of Conformance: "No NTEP National Type Evaluation Program (NTEP) testing has been performed on the device equipped with vapor recovery option or equipment to determine compliance with air resources board requirements."**~~ **Note: Not needed already stated in Technical Policy J.]**

Compatibility Test

Similar devices that were individually tested for a similar application can be "mixed and matched" without additional testing, if the system functions properly during the initial ~~**routine field**~~ test. For example~~**, inspectors**~~ **NTEP** can determine the compatibility of an approved console interfaced with an approved retail motor fuel dispenser during a ~~**field**~~ **type** evaluation when both components are previously approved in like applications. If devices are to be used in dissimilar applications, then additional NTEP testing is required.

Discussion: The Sector reviewed the proposed changes and agreed that there are multiple points in this section that are confusing. Sector Technical Advisor, Tina Butcher noted that the original section was intended to cover multiple applications. Over time, permanence test criteria were changed or deleted for certain device types and there appears to be residual language that needs to be moved or deleted. NTEP Director, Jim Truex noted that there have been arguments from manufacturers over the requirements for permanence testing, and modifying the language as proposed are intended to help eliminate these instances. After discussing the proposed changes at length, the Sector agreed that the proposed changes will help with some of the confusion, but more work is needed.

Decision: The Sector agreed to recommend with the proposed changes to NCWM Pub 14 for the time being. The Sector agreed that additional clarifications to this first section would be helpful; this will be a carryover item for next year. Tina Butcher agreed to rework the section based on the Sector's discussions and past decisions and circulate those proposed revisions to the labs, Rich Miller, and Dmitri Karimov and bring it back next year for the Sector to review.

7. Diesel Exhaust Fluid (DEF) - Testing Criteria to Include DEF on an NTEP CC

Source: NTEP Laboratories

Background Information: NTEP evaluators routinely are asked what testing is necessary to cover DEF on NTEP certificates. Another common question is what testing is necessary to get a family of meters certified for DEF and what other products will be included.

The current policy has been questioned at times by applicants. For example, a recent client stated that DEF is 67% water and 32% Urea. Mag Flow conductance for Urea is 5000 micro siemens/centimeter and water is 725 (see page LMD-7 in Pub 14 for both products). Plus, they are in different families.

NTEP tested the product with DEF. NTEP concluded that each family (water and fertilizer) should be tested to establish conductivity. Our thoughts were that we would simply give the product DEF (the product actually tested) on the CC since we are not really establishing conductivity for the family table for either water or fertilizer. In this case, after discussion, NTEP let the client know that they had a couple of choices.

1. Test only DEF and only get DEF with no conductance range

2. Test water and Urea which would establish conductivity for both water and fertilizer families.

Recommendation: Currently DEF is and has been considered fertilizer due to the Urea content. DEF is prevalent enough now to justify its own category listing. Establish a separate product category for diesel exhaust fluid (DEF).

Discussion: NTEP Director, Jim Truex introduced the item on behalf of the NTEP Laboratories, noting the proposal arose from discussions among the laboratories who need more specific criteria to address DEF. He clarified that the criteria are intended to apply to all meter types. Some Sector members asked if the proposed change, if adopted, would affect the status of current NTEP Certificates of Conformance (CCs) and Mr. Truex noted that NTEP would not require companies to resubmit CCs for evaluation. Some questioned whether not having the reference on a current CC might not create a disadvantage compared with companies getting new CCs with the listing on the CC.

Mr. Truex noted that DEF is becoming prevalent enough that people want this to be specifically listed on their CCs and giving DEF its own category night help answer some of the questions and clear up some current confusion. The Sector acknowledged that the Family of Products Table does not provide an exhaustive listing of specific products; these are just examples of products and their characteristics that might be measured with a given meter type and a classification of how they would be treated regarding NTEP testing.

There was some additional discussion about the nature of DEF and some commented on the fact that there can be different percentages of water used in the mixture. The Sector spent some time discussing possible ranges to list in the table. The Sector finally agreed that more research is needed and concluded that this task would be better completed outside of the meeting.

Decision:* *The group discussed this item at length, including proposed parameters for DEF and Urea. The proposed changes are more complex than can be resolved at the meeting and the Sector wants to see a final, marked-up draft of the changes to the Product Family Table before making a decision.

Mr. Keilty agreed to lead a small group of volunteers consisting of the following to work on this item:

Mr. Michael Keilty (Endress + Hauser)

Mr. Rich Miller (FMC)

Mr. Craig Cavanaugh (Tuthill Transfer System)

Mr. Robin Parsons (Parafour Innovations)

The group will develop and circulate a proposal to the remainder of the Sector in a ballot to add DEF as a separate line item for each meter type in the Product Family Table. In addition, the group will further review the listings for Urea to ensure the references are accurate.

8. Display of Unit Prices to Greater than Two Decimal Places for Bulk Fuel Metering Systems

Source: Be Fitchett, Southern States Cooperative, Inc.

Purpose: Removal of Section 1.22., NCWM Pub 14, Liquid Measuring Device Checklist. There is a legitimate need for retailers who deliver bulk fuel (other than motor fuels) to display and record unit prices greater than two decimal places to the right of the decimal point.

Recommendation: Remove Section 1.22. from LMD Checklist Page LMD-24 as shown below.

<u>LMD Checklist, Page LMD-24:</u>

Code Reference: G-S.5.1. and G-S.5.2.2. Indicating and Recording Elements

Several requirements of a general nature facilitate the reading and interpretation of displayed values. Each display for quantity or total price must be appropriate in design and have sufficient capacity for particular applications to be suitable for the application. For example, retail fuel dispensers capable of indicating to 99.999 liters or gallons or $99.99 are appropriate for automobiles at today's prices, but that are unsuitable for fueling trucks where deliveries may regularly exceed 100 liters or gallons and $100. Metering devices must be capable of indicating the maximum quantity and money values that can normally be expected in a particular application.

1.16. The maximum money value and quantity indications and unit prices are appropriate for the intended use.	☐ Yes ☐ No ☐ N/A
1.17. The indications must be clear, definite, and accurate.	☐ Yes ☐ No ☐ N/A
1.18. The indications must be easily read under normal operating conditions.	☐ Yes ☐ No ☐ N/A
1.19. Totalizer values must be accurate to the nearest minimum interval with decimal points displayed or subordinate digits adequately differentiated from others, if applicable.	☐ Yes ☐ No ☐ N/A
1.20. Symbols for decimal points shall clearly identify the decimal position. (Generally acceptable symbols are dots, small commas, or x.)	☐ Yes ☐ No ☐ N/A
1.21. The zero indication must consist of at least the following minimum indications as appropriate:	☐ Yes ☐ No ☐ N/A
1.21.1. One digit to the left and all digits to the right of a decimal point.	☐ Yes ☐ No ☐ N/A
1.21.2. If a decimal point is not used, at least one active decade plus any constant zeros.	☐ Yes ☐ No ☐ N/A
1.21.3. A fixed or constant zero cannot appear after a decimal point, (e.g., all decades to the right of a decimal point must be active).*	☐ Yes ☐ No ☐ N/A
~~1.22. Unit price values shall be displayed and recorded to the nearest 1 cent ($ 0.01), except motor fuel dispensers which are permitted to display and record up to three decimal places to the right of the decimal point ($0.001).~~	☐ Yes ☐ No ☐ N/A

*A fixed zero may appear after a decimal point on a receipt and/or console if the system is unable to distinguish if the digit is fixed or active.

Background: The submitter provided the following background information for this item.
Southern States Cooperative delivers bulk fuel (LP Gas (propane), gasoline, and diesel products) from 33 of our Company Owned Retail locations (as well as a similar number of our Member Coops). These locations use fuel trucks that are equipped with metering devices that must comply with HB 44 requirements.

The submitter is in the process of creating and implementing a mobile solution (software and hardware) to be installed in all of our fuel trucks. These systems will interact directly with the fuel meters to read in quantity delivered, calculate extended price, and print a combined delivery ticket/invoice to leave with customers. The software component, MAgExpress, will later sync with our point-of-sale system, MerchantAg, to finalize fuel delivery orders. MAgExpress and MerchantAg are both products of our software provider, EFC.

During the development of the MerchantAg software, EFC reached out to the Maryland Department of Agriculture in order to obtain a Certificate of Conformance. They were put in touch with NTEP evaluator, Joe Eccleston. After his evaluation of MAgExpress, he provided EFC with a few software requirements that needed to be resolved in order to gain compliance. Unfortunately, one of the requirements will fundamentally change the way SSC goes to market with all bulk fuels except motor fuels. The requirement stems from a new checklist item, Section 1.22., in NCWM Publication 14, added at the NTEP Measuring Sector Meeting in September of 2016. The new section requires liquid measuring devices to display and record unit prices to the nearest 1 cent ($0.01).

Justification for removing new Section 1.22. from NCWM Pub 14, Liquid Measuring Device Checklist:

1. Pricing bulk fuel to three decimal places to the right of the decimal point ($0.001) is standard business practice for fuel suppliers (not just SSC). In these markets, customers are used to seeing unit prices that include fractions of cents.

2. Customers who purchase large amounts of fuel will often enter into contract arrangements with their fuel suppliers in order to manage the risk of price increases.

    a. Sometimes, the contract price is a number that floats based upon an index that goes out to three or even four decimal places. In those cases, the customer expects to see a three or four-digit price on their invoices.

    b. Larger customers (including many government entities) will determine which supplier wins a contract bid based on prices that extend out to fractions of pennies. If SSC is forced to move to two-digit pricing because of our new software, it will cause irreparable harm to our ability to compete for those contracts.

The submitter also referenced the following item from the Sector's 2016 meeting when the Sector agreed to add Section 1.22 to the LMD Checklist:

Excerpts from Item 4 of the 2016 Measuring Sector Summary:

4. Display of Unit Price in Tenths of a Cent.

Source: NTEP Measuring Labs via NTEP Director Jim Truex

Recommendation: The Sector is asked to consider the addition of a specific Handbook 44 code reference to the lead in paragraph to NCWM Pub 14, Liquid Measuring Device Checklist, Section 1.16. to read as follows:

> "Code References: G-S.5.1**. and G-S.5.2.2.** Indicating and Recording Elements"

The Sector is also asked to consider recommending the addition of a new section **1.22.** to read as follows:

Page LMD-23, 2016 Edition:

Code Reference<u>s</u>: G-S.5.1. <u>and G-S.5.2.2.</u> Indicating and Recording Elements
Several requirements of a general nature facilitate the reading and interpretation of displayed values. Each display for quantity or total price must be appropriate in design and have sufficient capacity for particular applications to be suitable for the application. For example, retail fuel dispensers capable of indicating to 99.999 liters or gallons or $99.99 are appropriate for automobiles at today's prices, but that are unsuitable for fueling trucks where deliveries may regularly exceed 100 liters or gallons and $100. Metering devices must be capable of indicating the maximum quantity and money values that can normally be expected in a particular application.

…

<u>1.22. Unit price values shall be displayed and recorded to the nearest 1 cent ($ 0.01), except motor fuel dispensers which are permitted to display and record up to three decimal places to the right of the decimal point ($0.001).</u>

…

Background: During an NTEP evaluation the evaluator was asked to accept a recording element and receipt where the unit price was indicated and printed out to four decimal places (example: $3.6990). The NTEP Labs acknowledge that it is customary for dispensers to indicate unit price values to three decimal places but do not think it is appropriate for other devices, such as POS systems, registers for meters). Total price values need to be rounded to the nearest cent. The NTEP labs propose the following amendments to NCWM Pub 14.

Discussion: Sector Chairman, Michael Keilty, reviewed the item and its source, noting that the goal is to add clarity and consistency to the requirements for displaying unit prices on RMFDs. NTEP Director, Jim Truex, and a number of others questioned the need for multiple places past the decimal point; since transactions are conducted based on whole cents, the need for even tenths of a cent seems inappropriate. However, the practice for expressing unit prices to a tenth of a cent is already ingrained in the system.

Sector Technical Advisor, Mrs. Tina Butcher, commented that there are two different issues being discussed: (1) The value of the unit price is not sealable; and (2) The appropriate number of places past the decimal point for a unit price display. Mrs. Butcher also commented that it seems like the ability to make adjustments to the number of places past the decimal point should be a sealable feature; however, there was no additional discussion on this point. Mr. Truex and others agreed that the gap and lack of clarity around the appropriate number of places needs to be corrected and the Sector agreed that the proposed language will accomplish this.

Mr. Gordon Johnson (Gilbarco) expressed concerns that the change regarding the number of places past the decimal is not supported by a specific Handbook 44 reference. Others felt that the General Code adequately supported the change. The Sector discussed the idea of adding a reference to General Code Paragraph G-S.5.5. Money Values, Mathematical Agreement as well; however, there wasn't strong support to do this. Some manufacturers expressed concern about possible instances where they find that the additional places are legitimately needed, but couldn't provide examples at that point. The Sector agreed that there is always the option to bring the issue back at a future point should a specific need be identified.

Decision: The Sector agreed to recommend the proposed changes to the checklist. The Sector acknowledged that there are not specific references in Handbook 44 to reflect the proposed changes; however, there is a reference in the General Code under which the proposed changes clearly fall. Consequently, the Sector concurred that the proposed changes are supported by Handbook 44.

Discussion: NTEP Director, Mr. Jim Truex provided a history of the issue. Last year the Sector agreed to add a prohibition to the use of a unit price expressed to three decimal places. This decision was based on an interpretation of the General Code and suitability of indications. Some questioned whether contract sales are under the authority of weights and measures jurisdictions.

Technical Advisor, Mr. Tina Butcher pointed out that weights and measures jurisdictions may not routinely regulate all commercial measurement applications under their jurisdiction, but that does not necessarily mean they don't have authority over the applications. It will depend on their weights and measures laws and regulations. Robin Parsons (Parafour Innovations) and others noted Mr. that many companies who enter into contract sales think that if the device is used as a wholesale device it is not subject to weights and measures provisions. Some noted that for sales of very large quantities (e.g., millions of gallons) of product that a tenth or even thousandth of a cent can result in a huge price difference and so contracts are often negotiated to a resolution much finer than one might expect in non-contract sales.

Mr. Truex noted that the NTEP Labs generally think that the unit price shouldn't be expressed to any finer resolution than the whole cent; except for retail motor-fuel dispensers for which there is already an ingrained practice. Allen Katalinic (NC) stated he doesn't believe there is a need to go out as far as some are going in the resolution of the unit price. The U.S. money system is based on cents and to do otherwise seems inappropriate. There was also discussion regarding the use of the tenth of a cent in unit pricing in gasoline sales. Many think this is inappropriate as well and sometimes gives rise to consumer complaints, but it's a market practice that has been allowed for a long time and, unfortunately, would be difficult to change. Mrs. Butcher noted that the NIST Handbook 130 Method of Sale for Hydrogen Measuring Devices Code in Handbook 44 specifically restricts unit prices from being expressed in any finer resolution than a whole cent. However, she indicated she didn't believe there aren't any such restrictions on other devices at this point.

Mr. Joe Eccelston (MD) questioned how Canada addresses this, thinking we might be able to draw some parallels. Luciano Burtini (Measurement Canada) noted that they have no language to prohibit the finer resolution of unit price, but they require everything to be rounded to the nearest cent in calculations. He also noted that they have eliminated pennies on cash sales, so sales are rounded to the nearest five cents if you are paying cash; if you are paying via credit, the transaction is rounded to the nearest cent.

Decision: Although some Sector members felt that expressing the unit price to less than the whole cent is inappropriate and unnecessary, there may be a valid need for it under some circumstances. Without a specific prohibition in HB 44, the Sector felt like it would be difficult to prohibit this practice and acknowledged it may be needed for some applications. Consequently, the Sector agreed to recommend striking the prohibition and language added last year in checklist item 1.22 as shown in the recommendation above. After lengthy discussion, the Sector believes this issue might be better addressed at some point in the future through a proposal to modify HB 44 to include requirements that specify unit price resolution.

Additional Items as Time Allows:

If time permits, the NCWM S&T Committee and/or other groups would appreciate input from the Measuring Sector on the measuring-related issues that are outlined in the remaining agenda items below. A copy of any regional association modifications or positions will be provided to the Sector when these are made available by the regions. For each item in this section, the Sector is asked to review the item and consider providing input that might assist the S&T Committee in their deliberations.

9. S&T 2017 Carryover Items 3100-1 and 3600-2 – (Summing of Multiple Electronic Elements) - G-S.5.2.2. Digital Indications and Recorded Representations and Appendix A – Fundamental Considerations – Section 4.4. General Considerations

Source: Ross Andersen, Retired (2017)

Purpose: Address the application of the code requirements across multiple devices.

Items Under Consideration: The submitter is proposing the following modifications to General Code Paragraph G-S.5.2.2. Digital Indications and Recorded Representations and Appendix A – Fundamental Considerations – Section 4.4. General Considerations.

G-S.5.2.2. Digital Indication and Representation. – Digital elements shall be so designed that:

(a) All digital values of like value in a system agree with one another.

(b) A digital value coincides with its associated analog value to the nearest minimum graduation.

(c) A digital value "rounds off" to the nearest minimum unit that can be indicated or recorded.

(d) A digital zero indication includes the display of a zero for all places that are displayed to the right of the decimal point and at least one place to the left. When no decimal values are displayed, a zero shall be displayed for each place of the displayed scale division.
[Nonretroactive as of January 1, 1986]

(e) A digital value that is electronically summed from the digital indications of multiple independent devices shall be mathematically correct.
[Nonretroactive as of January 1, 20XX]

(Amended 1973, and 1985**, and 20XX**)

4.4. General Considerations. –

The simpler the commercial device, the fewer are the specification requirements affecting it, and the more easily and quickly can adequate inspection be made. As mechanical complexity increases, however, inspection becomes increasingly important and more time consuming, because the opportunities for the existence of faulty conditions are multiplied. It is on the relatively complex device, too, that the official must be on the alert to discover any modification that may have been made by an operator that might adversely affect the proper functioning of the device. **Code requirements in the Handbook are applied only to a single device or system, unless specifically stated in the code. An electronic sum of measured values from multiple devices is not subject to code requirements, except that it be mathematically correct, i.e. add up to the proper sum - See General Code G-S.5.2.2.(e).**

It is essential for the officials to familiarize themselves with the design and operating characteristics of the devices that he inspects and tests. Such knowledge can be obtained from the catalogs and advertising literature of device manufacturers, from trained service persons and plant engineers, from observation of the operations performed by service persons when reconditioning equipment in the field, and from a study of the devices themselves.

Inspection should include any auxiliary equipment and general conditions external to the device that may affect its performance characteristics. To prolong the life of the equipment and forestall rejection, inspection should also include observation of the general maintenance of the device and of the proper functioning of all required elements. The official should look for worn or weakened mechanical parts, leaks in volumetric equipment, or elements in need of cleaning.

Background: The submitter believes that the NCWM made a mistake in 1990 in interpreting how code requirements are applied to multiple-platform scales with multiple indicators. The submitter is proposing changes to the General Code and the Fundamental Considerations that would require that a summed indication derived by summing indications of individual elements be mathematically correct, but exempt the summed indication from other code requirements. While these proposals were designed to address concerns raised in conjunction with the application of requirements to weighing systems. The inclusion of the proposed changes in the General Code and Fundamental Considerations would extend their application to all weighing and measuring devices covered by Handbook 44. The Sector may wish to review the proposed changes and consider any potential impact on measuring systems that may provide summed indications derived from individual measuring elements (if such systems exist).

For full details on this issue, including the submitter's justification and recommendations and other background information, please see Appendix A, Pages S&T – A6 and A96 in the S&T Committee's 2017 Interim Report found at: **www.ncwm.net/_resources/e30d:omyqm5-od/files/75729907zaec3e14d/_fn/4-ST-Web.pdf**

Discussion: Sector Technical Advisor, Mr. Tina Butcher noted she included this item on the agenda in case it may impact systems in which there are multiple measuring elements tied to a single indicator. Some Sector members reported it did not impact their applications. Mr. Craig Cavanaugh (Tuthill Transfer Systems) commented that in boat applications the unused portion of diesel fuel used to flood an engine may be measured; however, he isn't certain if this measurement is being used as the basis for a commercial transaction. Michael Keilty suggested another potential application might be where additives are measured for inclusion in a mixture. Allen Katalinic (NC) commented that if you are adding individual values together, it becomes a system and the total should have to meet the same requirements; those indications shouldn't be exempt.

Decision: Although the Sector did spend time discussion the concept of the proposal, the Sector has no specific suggestions to offer on this item.

10. S&T 2017 Carryover Item (3300-2) – LMD Code – UR.3.4. Printed Ticket

Source: Morrow County, OH (2017)

Purpose: Require that printed receipts declares an alpha or numeric pump designation that coincides with the dispensing device used for a specific transaction.

Item Under Consideration: Modify LMD Code Paragraph UR.3.4. Printed Ticket as follows.

> UR.3.4. Printed Ticket. – **<u>This requirement applies only to devices that are capable of issuing a printed ticket.</u>** The total price, the total volume of the delivery, **<u>a corresponding alpha or numeric dispenser designation</u>** and the price per liter or gallon shall be shown, either printed by the device or in clear hand script, on any printed ticket issued by a device and containing any one of these values.
>
> (Amended 2001 **<u>and 2017)</u>**

Background: The submitter stated that, with these proposed changes, the consumer as well as the weights and measures official would be able to verify that all transaction information corresponds accurately at locations with multiple dispensers on site. If no pump designation is on the receipt it hinders the consumer's ability to know that they were given the correct receipt for the transaction. Similarly, a pump designation on the receipt will asset weights and measures in verifying correct communication between devices as well as follow up as needed in case of a consumer complaint. The submitter recognizes that software updates would be required for those establishments that do not already meet this proposed requirement.

The S&T Committee heard suggestions at the July 2017 NCWM Annual Meeting that corresponding modifications should be considered to specifications in the LMD Code related to recorded representations, including Paragraphs S.1.6.7. Recorded Representations (POS Systems) and S.1.6.8. Recorded Representations for Transactions Where a Post-Delivery Discount(s) is Provided. Without corresponding changes to such paragraphs, the proposed modifications to UR.3.4. would result in a device owner needing to hand write the pump number on any system that does not already provide that information. The Committee and others believe the proposal has merit and would benefit consumers, inspectors, and device owners; however, the Committee believes additional work is needed and changed the status of the item from "Voting" to "Developing" in order to allow the submitter to further develop the item.

For full details on this issue, including the submitter's justification and recommendations and other background information, please see Appendix A, Page S&T – A56 in the S&T Committee's 2017 Interim Report found at: **www.ncwm.net/_resources/e30d:omyqm5-od/files/75729907zaec3e14d/_fn/4-ST-Web.pdf**

Discussion: Sector Technical Advisor, Tina Butcher, explained the history of the proposal and its purpose. She commented that she understands the submitter has subsequently modified the proposal to add proposed changes to LMD Code Paragraph S.1.6.7. Recorded Representations (Point of Sale Systems) and S.1.6.8. Recorded Representations for Transactions Where a Post-Delivery Discount(s) is Provided as suggested during the S&T Committee Open Hearings at the 2017 Interim and Annual Meetings. Including requirements in the specifications will: (1) help ensure that the device owner/operator has a means for readily including this information on all recorded representations; and (2) prevent a user from having to hand write this information by hand on a receipt generated by a card reader in a dispenser that does not presently include the pump designation information. The Sector questioned how may dispensers are able to accommodate this requirement. Mrs. Butcher reported that Gordon Johnson (Gilbarco) had stated that there may be some systems that don't currently comply and additional time may be needed to bring them into compliance.

Decision: The Sector agreed with the merit of requiring the pump number/designation on the receipt. The Sector encourages the S&T Committee to explore the impact on the device manufacturer and ensure that appropriate timing is considered for the effective date. The Sector also noted that there needs to be corresponding specifications and user requirements tied together.

11. S&T 2017 Carryover Item (3302-2) LPG & NH_3 Code, N.4.2.4. Repeatability Tests - Type Evaluation

Source: Ross Andersen, Retired (2017)

Purpose: Address differences between Handbook44 and Publication 14 practices for LPG Liquid Meter testing.

Item under Consideration: Amend NIST Handbook 44 Liquid Measuring Devices Code as follows:

> **N.4.1.2. Repeatability Tests. –** Tests for repeatability should include a minimum of three consecutive test drafts of approximately the same size and be conducted under controlled conditions where variations in factors such as temperature, pressure, and flow rate are reduced to the extent that they will not affect the results obtained. **<u>Repeatability tests shall be based on the uncompensated volume, e.g. with the temperature compensator deactivated. Both field tests and type evaluation tests shall be run at flow rates consistent with normal tests as specified in N.4.1.</u>**
>
> **<u>(Amended 20XX)</u>**

Add a new Paragraph N.4.2.4. as follows:

> **<u>N.4.2.4. Repeatability Tests for Type Evaluation. – Tests for repeatability should include a minimum of three consecutive test drafts of approximately the same size and be conducted under controlled conditions where variations in factors such as temperature, pressure, and flow rate are reduced to the extent that they will not affect the results obtained. Repeatability tests shall be based on the uncompensated volume, e.g. with the temperature compensator deactivated. Type evaluation tests shall be run at flow rates consistent with special tests as specified in N.4.2., N.4.2.1., N.4.2.2,, or N.4.2.3. as appropriate.</u>**
>
> **<u>(Added 20XX)</u>**

Background: The proposal is aimed to correct a number of areas of confusion. The inclusion of repeatability in the N.4.1. series indicates that repeatability is to be run at normal flow rates. There was some confusion if this was the actual intent? Running the tests only at Normal flow rates is consistently how the test was performed in the field. The amendment to N.4.1.2. clarifies this explicitly for field tests and type evaluation tests.

The new paragraph was added because NTEP has for a long time required repeatability on tests over the entire range of flow rates conducted under controlled conditions during type evaluation testing. This means anywhere between rated maximum and minimum flow rates. The code addition now formalizes and legitimizes what has been done for a long time.

Another question arose whether gross or net results could be used in repeatability tests? Obviously, you can't compare net to gross but you can compare three consecutive gross or three consecutive net results. As the practice in HB44 is to test one variable at a time to the extent possible, the revision clarifies that repeatability is addressed to gross meter performance only. This can be through deactivating the ATC or just using gross values where both gross and net are available from the same test.

At the its 2017 NCWM Interim Meeting open hearings, the S&T Committee heard support for the item from Mr. Dmitri Karimov (Liquid Controls) on behalf of the MMA.

Mrs. Tina Butcher (OWM) clarified that although it is common for repeatability to be conducted at the normal flow rate, there is nothing precluding an inspector from running these tests at any valid flow rate. The meter should be expected to meet repeatability requirements at any flow rate throughout the approved range. There was also some discussion as to whether repeatability should only be applicable to gross or uncompensated meter readings. Some felt that the same requirements should also be applicable when testing a meter in net or compensated mode. OWM suggested that this may have unintended consequences. These may include errors or stability issues in the temperature compensation being interpreted as apparent repeatability issues.

Mr. Constantine Cotsoradis (Flint Hills Resources) also questioned whether or not repeatability requirements may be applied to the compensated, net registrations.

Mr. Michael Keilty (Endress + Hauser Flowtec AG) commented that the proposal should be further evaluated by the NTEP laboratories.

Mr. Karimov reminded the group that any changes to the requirements must consider all meter technologies and not just positive displacement (PD) meters.

Ultimately, the Committee agreed that more work was needed to develop the item and assigned it a "Developing" status.

For full details on this issue, including the submitter's justification and recommendations and other background information, please see Appendix A, Page S&T – A75 in the S&T Committee's 2017 Interim Report found at: **www.ncwm.net/_resources/e30d:omyqm5-od/files/75729907zaec3e14d/_fn/4-ST-Web.pdf**

Discussion: Sector Technical Advisor, Tina Butcher provided an summary of this issue, noting there are three main points to be addressed in considering the proposal: (1) Are the repeatability requirements only applicable to drafts conducted at a fast flow rate (i.e., should a device only be capable of meeting repeatability requirements at a single flow rate)?; (2) Is it permissible to conduct repeatability tests when the compensator is activated and engaged?; and (3) Why would one want to restrict the ability to conduct repeatability testing at any flow rate to type evaluation?

Mr. Luciano Burtini (Measurement Canada) reported they would have concerns about doing repeatability testing with the compensator activated since it would be difficult to determine if any failure was due to meter operation or compensator operation or both. Some noted that this seems logical for mechanical compensators, but for electronic compensators, in which the corrections are simply applied through a mathematical formula, it seemed that the device should be capable of meeting the repeatability tolerances. Jim Truex expressed concerns about the proposed N.4.2.4. Repeatability Tests for Type Evaluation, noting that some inspectors may attempt to apply it in the field.

Several Sector members expressed concerns about conducting repeatability (e.g., applying the tighter repeatability tolerances) at lower flow rates for routine field testing. During type evaluation, Mr. Rodney Cooper (Brodie International) and Mr. Marc Buttler (Emerson Process) noted that the evaluator generally has access to more data and the manufacturer is available to help ensure test conditions are appropriately controlled.

Decision: The Sector expressed general concern over the application of the repeatability tolerances to tests conducted at other than slow rates. This opinion is shared for other types of products besides LPG as well. The Sector acknowledged that this would allow a potential variation of 2% between LPG runs at slower flow rates. The Sector noted that, for type evaluation, the manufacturer is present for those tests and can ensure that tests are conducted under consistent conditions.

12. S&T 2017 Carryover Item (3600-5) –Appendix D – Remote Configuration Capability

Source: NIST Office of Weights and Measures

Purpose: Expand the scope of definition to cover instances where the "other device," as noted in the current definition, may be necessary to the operation of the weighing or measuring device or which may be considered a permanent part of that device.

Item under Consideration: Add a new paragraph to the General Code and modify the LMD Code; VTM Code; LPG & NH3 Code; Hydrocarbon Gas Vapor-Measuring Devices Code; Cryogenic Liquid-Measuring Devices Code; Milk Meters Code; Water Meters Code; Mass Flow Meters Code; Carbon Dioxide Liquid-Measuring Devices Code; and Hydrogen Measuring Devices Code as shown below. Note that the full proposal to the S&T Committee includes proposed changes to other Handbook 44 Codes; in the interest of brevity, only the proposed changes relevant to measuring systems were shared with the Sector and reviewed during the Sector's discussions of this item. Similarly, to reduce the size of this meeting summary, only the proposed changes to the General Code and the Liquid-Measuring Devices Code are shown below. Please refer to the NCWM S&T Committee's 2018 Interim Agenda or contact the NIST Technical Advisor for a copy of the full proposal and recommended changes to other measuring system codes.

1.10 General Code:

G-S.8.2. Devices and Systems Adjusted Using Removable Digital Storage Device. - For devices and systems in which the configuration or calibration parameters can be changed by use of a removable digital storage device, such as a secure digital (SD) card, USB flash drive, etc., security shall be provided for those parameters using an event logger in the device. The event logger shall include an event counter (000 to 999), the parameter ID, the date and time of the change, and the new value of the parameter. A printed copy of the information must be available on demand through the device or through another on-site device. In addition to providing a printed copy of the information, the information may be made available electronically. The event logger shall have a capacity to retain records equal to 10 times the number of sealable parameters in the device, but not more than 1000 records are required. (Note: Does not require 1000 changes to be stored for each parameter.)

(Added 20XX)

3.30 Liquid Measuring Devices:

S.2.2. Provision for Sealing. – **For devices and systems in which the configuration or calibration parameters can be changed by use of a removable digital storage device, security shall be provided for those parameters as specified in G-S.8.2. For parameters adjusted using other means, the following applies:**

Adequate provision shall be made for an approved means of security (e.g., data change audit trail) or for physically applying a security seal in such a manner that requires the security seal to be broken before an adjustment or interchange can be made of:

(a) any measuring or indicating element;

(b) any adjustable element for controlling delivery rate when such rate tends to affect the accuracy of deliveries; and

(c) any metrological parameter that will affect the metrological integrity of the device or system.

When applicable, the adjusting mechanism shall be readily accessible for purposes of affixing a security seal.

*[Audit trails shall use the format set forth in Table S.2.2.]**
*[*Nonretroactive and Enforceable as of January 1, 1995]*
(Amended 1991, 1993, 1995, 2006, and **20XX**)

Similar changes to those proposed for Section 3.30 above are proposed to the following codes; see the 2018 NCWM S&T Committee Agenda or contact the Technical Advisor for details.

3.31. Vehicle-Tank Meters

3.32. LPG and Anhydrous Ammonia Liquid-Measuring Devices

3.33. Hydrocarbon Gas Vapor-Measuring Devices

3.34. Cryogenic Liquid-Measuring Devices

3.35. Milk Meters

3.36. Water Meters

3.37. Mass Flow Meters

3.38. Carbon Dioxide Liquid-Measuring Devices

3.39. Hydrogen Gas-Measuring Devices – Tentative Code

Background: The S&T Committee initially considered a proposal from the NTEP Grain Analyzer Sector to modify the definition for "remote configuration capability." The proposal was intended to address the use of removable digital storage devices (such as a flash drive, memory card, etc.) in transferring calibration and other metrologically significant information to weighing and measuring devices. The Committee heard a lot of opposition to the proposed changes to the definition; however, acknowledged that changes are needed to adequately address security requirements for systems capable of adjustments using these types of devices. The Grain Analyzer Sector decided to address its concerns by requiring event loggers (which provide detailed information about metrologically significant changes made to a device) on grain analyzers with this capability. NIST OWM recognized that current NIST Handbook 44 requirements for device security do not adequately address other device types with these capabilities and asked the Committee to reassign the item to OWM. OWM presented the proposals outlined in the Item Under Consideration to the Committee in July 2017 and is asking that the regional weights and measures associations support forwarding the proposal to the S&T Committee as a voting item for the 2018 NCWM cycle. The proposal would essentially require an event logger on any device with the capability for accessing metrologically significant adjustments through removable digital media; existing requirements for device security would continue to apply to device types without this capability. OWM would appreciate input from the Sector on the proposed changes.

For full details on this issue, including the submitter's justification and recommendations and other background information, please see Appendix A, Page S&T – A107 in the S&T Committee's 2017 Interim Report found at: **www.ncwm.net/_resources/e30d:omyqm5-od/files/75729907zaec3e14d/_fn/4-ST-Web.pdf**

Discussion: Mrs. Tina Butcher (NIST OWM), Sector Technical Advisor, provided an overview of the proposal. Multiple Sector members supported the proposal in concept, and Marc Buttler, Micro Motion, noted that the proposal seems a better alternative than trying to rework the current sealing criteria and inadvertently make a change that negatively affects current equipment. Michael Keilty (Endress + Hauser) noted that some of his company's devices can be recalibrated or reconfigured through the use of digital media; however, a physical seal protects access to the removable media. The only way a change could be made to metrological parameters would be to first break the physical seal. Other Sector members agreed that the use of the physical seal to protect the access point is much like a physical seal affixed to a cover or access point to prevent access adjustable parameters. Mrs. Butcher asked whether the proposal would be more acceptable if OWM were to develop and propose the addition of a provision stating that it does not apply to devices in which the physical seal provides adequate protection. Mr. Keilty and other members concurred with this suggestion.

Decision: The Sector is concerned that the proposed changes may require an event logger on devices which are currently adjusted via removable cards, etc., but on which a physical seal is used to prevent removal of the media without detection. The Sector believes that such a configuration would provide adequate security. If the proposed requirements were modified to clarify that these requirements do not apply in instances when access to the removable media is protected with a physical seal, the Sector would be more amenable to the proposal.

13. S&T 2018 New Item – Vapor Elimination, Measuring Codes

Source: NCWM S&T Committee/Tina Butcher (NIST OWM)

Purpose: To align language in Sections 3.32 LPG and Anhydrous Ammonia Liquid-Measuring Devices Code; 3.34 Cryogenic Liquid Measuring Devices Code; and 3.38. Carbon Dioxide Liquid-Measuring Devices Code with changes adopted in 2017 to the Liquid-Measuring Devices Code; the Vehicle-Tank Meters Code; the Milk Meters Code; the Water Meters Code; and the Mass Flow Meters Code.

Item under Consideration: Amend the requirements for vapor elimination in the following NIST Handbook 44 Sections and Paragraphs as outlined below:

Section 3.32. LPG Code:

S.2. Design of Measuring Elements.

S.2.1. Air/Vapor Elimination. A ~~device~~ **measuring system** shall be equipped with an effective **air/vapor eliminator or other** automatic means to prevent the passage of **air/**vapor through the meter. Vent lines from the **air/**vapor eliminator shall be made of appropriate non-collapsible material.
(Amended 2016)

Section 3.34. Cryogenic Liquid-Measuring Devices Code:

S.2. Design of Measuring Elements.

S.2.1. Air/Vapor Elimination. – A measuring system shall be equipped with an effective **air/**vapor eliminator or other ~~effective~~ **automatic** means to prevent the ~~measurement of vapor that will cause errors in excess of the applicable tolerances~~ **passage of air/vapor through the meter. Vent lines from the air/vapor eliminator shall be made of appropriate non-collapsible material.** (Also see Section T. Tolerances.)

Section 3.38. Carbon Dioxide Liquid-Measuring Devices Code:

S.2. Design of Measuring Elements.

S.2.1. Vapor Elimination.

~~(a)~~ A ~~device~~ **measuring system** shall be equipped with an effective **air/vapor eliminator or other** automatic means to prevent the passage of **air/**vapor through the meter.

~~(b)~~ Vent lines from the **air/**vapor eliminator shall be made of appropriate non-collapsible material.

(Amended 2016)

Background: In 2016, changes were made to the requirements for vapor elimination in the LPG & NH_3 code to make the requirement less design specific; clarify that the means provided for vapor elimination must be "effective;" and recognize that the vent line need not be rigid, provided the material chosen is effective at preventing the vent line from being obstructed. In 2017, corresponding changes were made to:

- Section 3.30 Liquid-Measuring Devices Code (S.2.1);
- Section 3.31 Vehicle-Tank Meters Code (S.2.1);
- Section 3.35 Milk Meters Code (S.2.1);
- Section 3.36 Water Meters Code (S.2.2.1); and
- Section 3.37 Mass Flow Meters Code (S.3.3)

The changes made e to the Mass Flow Meters Code, include slight variations in the language to reflect that the introduction of air into the meter does not create accuracy problems for some mass flow metering systems.

In the process of reviewing the proposals submitted in 2017, the NCWM S&T Committee heard comments that similar changes should be made to align the language in the vapor/air elimination paragraphs in all the measuring codes. At the Committee's suggestion, the submitters of the 2017 item, Tina Butcher (NIST OWM) and Mr. Dmitri Karimov (Liquid Controls), prepared corresponding proposed changes to align the vapor/air elimination paragraph(s) in Sections 3.32, 3.34, and 3.38, including vetting these proposals with members of the Meter Manufacturers Association. The Committee felt that these changes could be incorporated into the existing proposal; however, the BOD concluded that these additional changes needed to be introduced as a separate item in the next NCWM cycle. Rather than delay the items presented in 2017, the Committee decided to recommend those items for a vote and propose the remaining items for a vote in 2018. Consequently, this current proposal to modify Sections 3.32., 3.34., and 3.38. is being submitted as outlined during the 2017 Interim Meeting. Note that, although the paragraph in Section 3.32. was modified in 2016, the changes proposed to the other measuring codes in 2017 included some additional minor changes to align format and language.

Discussion: Mrs. Tina Butcher (NIST OWM), Sector Technical Advisor, provided an overview of the proposal, noting that the intent of this proposal is to align the LPG, Cryogenic, and CO2 codes with the changes made in 2017 to corresponding requirements in other HB44 measuring codes. Sector Chairman, Michael Keilty, raised a question about using the terms "air" and "vapor," noting that the term should more appropriately be "vapor." S&T Committee Member, Luciano Burtini (Measurement Canada), and Mrs. Butcher commented that the Committee decided to use both terms to provide some consistency among the codes and to cover all scenarios. Craig Cavanaugh, Tuthill Transfer Systems, commented that including both terms wouldn't hurt anything and it may prevent confusion since many in the industry refer to "air eliminator" as a generic reference.

Decision: The Sector discussed whether the term "air" should be part of the proposals for these three codes. For consistency with other codes, the Sector sees no harm in allowing the term to remain. The Sector also noted that, should there be any air that would enter the system, the language would address this scenario as well.

14. S&T 2018 New Item – Water Meters – Paragraph S.2.1. Provision for Sealing

Source: John Roach, CA Division of Measurement Standards, California NTEP Laboratory

Purpose: To standardize sealing requirements in the Water Meter Code with the LMD code.

Recommendation: Adopt the three categories of sealing into the water meter code 3.36. like the criteria found in H44 LMD Code Paragraph and Table S.2.2. (See the current LMD Code and the 2018 NCWM S&T Committee Agenda to view the current criteria in other codes and the proposed criteria.)

Background Information: The submitter notes that water meters submitted to NTEP now have digital registers instead of the old analog odometer type of registers. The current water meter code section 3.36 S.2.1. provision of sealing, seems to only allow for a physical sealing provision. Digital registers use a remote device or even Near Field Communication (NFC). Because of the digital technology changes, MCWM should adopt the three categories for sealing into the water meter code to allow for audit trail event counter (Category 2) or event logger (Category 3) because a physical seal won't protect or even be tamper evident. Remote or NFC has the capability to change the unit of measure from gallons to cubic feet or even the calibration factor. We need the guidelines of Category 2 or 3 to properly seal meters that are digital. Otherwise, water meters using today's technology cannot be certified by NTEP.

Discussion: Mrs. Tina Butcher (NIST OWM and Sector Technical Advisor) provided an overview of the proposal, noting that the goal is to add specific criteria for electronic means of sealing similar to that which is already included in other HB44 Measuring System Codes. Some raised questions about whether meters currently used in domestic utility applications are equipped with remote configuration capability. Others confirmed that there are devices currently in use with this capability.

Decision: The Sector supports the proposal, noting that the addition of the proposed changes would provide more specific criteria needed for defining requirements for electronic sealing for water metering systems.

15. Discussion of Possible Meeting Location and Date

Background/Discussion: The Sector discussed plans for the 2019 Sector Meeting, including proposed locations and time frame. The Sector discussed the possibility of holding the meeting in conjunction with a regional association; however, there were multiple objections to extending travel beyond that required for a regional and to meeting on a weekend.

Decision: Most Sector members prefer not to hold the meeting in conjunction with a regional association meeting and want to avoid holding it over a weekend. The Sector agreed to recommend the following locations and time frames for the NCWM to consider. The Sector acknowledged that the final decision is up to the NCWM and the NCWM will be considering input from the other NTEP Sectors as well.

Possible destinations:

- *Atlanta, Georgia*
- *Baltimore/Annapolis, Maryland*
- *Columbus, Ohio*
- *Denver, Colorado (different hotel than before)*
- *Fort Wayne, Indiana*
- *Indianapolis, Indiana*
- *Jacksonville, Florida*
- *Orlando, Florida*

Possible time frames:

- ***Week of September 24-28***
- ***Week of October 1-5***

Note: The week of September 17-21 was also discussed; however, some members noted a possible conflict with a WELMEC meeting.

Appendix E

National Type Evaluation Program
Software Sector Meeting Summary

May 3, 2017
Columbus, OH

INTRODUCTION

The charge of the NTEP Software Sector is important in providing appropriate type evaluation criteria for software based weighing or measuring device based on specifications, tolerances, and technical requirements of NIST Handbook 44, "Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices," Section 1.10. General Code, Section 2 for weighing devices, Section 3 for liquid and vapor measuring devices, and Section 5 for taximeters, grain analyzers, and multiple dimension measuring devices. The Sector's recommendations are presented to the National Type Evaluation Program (NTEP) Committee each January for approval and inclusion in NCWM Publication 14, "Technical Policy, Checklists, and Test Procedures," for national type evaluation.

The Sector is also called upon occasionally for technical expertise in addressing difficult NIST Handbook 44 issues on the agenda of the National Conference on Weights and Measures (NCWM) Specifications and Tolerances (S&T) Committee. Sector membership includes industry, NTEP laboratory representatives, technical advisors, and the NTEP Administrator. Meetings are held annually, or as needed and are open to all NCWM members and other registered parties.

Proposed revisions to the handbook(s) are shown as follows: 1) deleted language is indicated with a **bold face font using ~~strikeouts~~** (e.g., **~~this report~~**), 2) proposed new language is indicated with an **underscored bold-faced font** (e.g., **new items**), and 3) nonretroactive items are identified in *italics*. There are instances where the Sector will use **red** text and/or highlighted text to bring emphasis to text that requires additional attention. When used in this report, the term "weight" means "mass."

Table A
Table of Contents

Table B
Glossary of Acronyms and Terms

Acronym	Term	Acronym	Term
BIML	International Bureau of Legal Metrology	OIML	International Organization of Legal Metrology
CC	Certificate of Conformance	OWM	Office of Weights and Measures
EPO	Examination Procedure Outline	PDC	Professional Development Committee
NCWM	National Conference on Weights and Measures	S&T	Specifications and Tolerances Committee
NIST	National Institute of Standards and Technology	SMA	Scale Manufacturers Association
NTEP	National Type Evaluation Program	WELMEC	European Cooperation in Legal Metrology

Details of All Items
(In order by Reference Key)

STATUS REPORTS – RELATED NCWM AND INTERNATIONAL ACTIVITY

NCWM Activity

The Software Sector didn't have any agenda items for the 2017 NCWM Interim Meeting. The Grain Analyzer Sector had an item regarding removable devices which did pertain to software. There were some suggested wording changes, to ensure it only covered metrologically-significant software, not all software changes. That item is Developing.

International Activity

Two weeks ago, we received a markup of D-31, which is being revised. Our concern is to ensure that the requirements are workable in the field. Originally the meeting was scheduled for June, but they've moved it back to mid-September in Berlin. Dr. Thompson intends to ask them to add a specific section for field inspectors. R129 was reviewed by the MDMD Work Group.

SOFTWARE SECTOR PRESENTATION

Technical Advisor Doug Bliss gave a presentation from the Software Sector for the benefit of those MDMD Work Group members who may not have been familiar with the Software Sector agenda items and the background behind them. The presentation can be found on the NCWM.net web site for those interested in reviewing the background.

CARRY-OVER ITEMS

1. Software Identification / Markings

Source:
NTEP Software Sector

Background:
See the 2016 Software Sector Meeting Summary for more background on this item.

Since its inception, the sector has wrestled with the issue of software identification and marking requirements. Numerous changes to the HB44 language were attempted and though support for the concepts was expressed, resistance to specific language made the course difficult. Finally, in 2015 in a joint meeting with the Measuring Sector, some additional fine tuning on the recommended changes to G-S.1 was done and we felt we had addressed everyone's concerns and had language ready to be voted upon for adoption. The recommended language is below.

Amend *NIST Handbook 44:* G-S.1. Identification as follows:

G-S.1. Identification. – All equipment, except weights and separate parts necessary to the measurement process but not having any metrological effect**,** shall be clearly and permanently marked for the purposes of identification with the following information:

(a) the name, initials, or trademark of the manufacturer or distributor;

(b) a model identifier that positively identifies the pattern or design of the device;

(1) The model identifier shall be prefaced by the word "Model," "Type," or "Pattern." These terms may be followed by the word "Number" or an abbreviation of that word. The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.). The abbreviation for the word "Model" shall be "Mod" or "Mod." Prefix lettering may be initial capitals, all capitals, or all lowercase.
[Nonretroactive as of January 1, 2003]
(Added 2000) (Amended 2001)

(*c*) *a nonrepetitive serial number, except for equipment with no moving or electronic component parts and* ~~**not-built-for-purpose software-based software devices**~~ ***software***;
[Nonretroactive as of January 1, 1968]
(Amended 2003)

(1) The serial number shall be prefaced by words, an abbreviation, or a symbol, that clearly identifies the number as the required serial number.
[Nonretroactive as of January 1, 1986]

(2) Abbreviations for the word "Serial" shall, as a minimum, begin with the letter "S," and abbreviations for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., S/N, SN, Ser. No., and S. No.).
[Nonretroactive as of January 1, 2001]

(*d*) the current software version or revision identifier for not-built-for-purpose software-based devices~~;~~ **manufactured as of January 1, 2004 and all software-based devices or equipment manufactured as of January 1, 2022;**
~~***[Nonretroactive as of January 1, 2004]***~~
(Added 2003) **(Amended 2017)**

(1) The version or revision identifier shall be:

i. *prefaced by words, an abbreviation, or a symbol, that clearly identifies the number as the required version or revision;*
[Nonretroactive as of January 1, 2007]
(Added 2006)

Note: If the equipment is capable of displaying the version or revision identifier but is unable to meet the formatting requirement, through the NTEP type evaluation process, other options may be deemed acceptable and described in the CC.
(Added 2017)

ii. ***continuously displayed or be accessible via the display. Instructions for displaying the version or revision identifier shall be described in the CC. As an alternative, permanently marking the version or revision identifier shall be acceptable providing the device does not always have an integral interface to communicate the version or revision identifier.***
[Nonretroactive as of January 1, 2022]
(Added 2017)

(2) Abbreviations for the word "Version" shall, as a minimum, begin with the letter "V" and may be followed by the word "Number." Abbreviations for the word "Revision" shall, as a minimum, begin with the letter "R" and may be followed by the word "Number." The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.). ***Prefix lettering may be initial capitals, all capitals, or all lowercase.***
[Nonretroactive as of January 1, 2007]
(Added 2006) (Amended 2017)

(e) an National Type Evaluation Program (NTEP) Certificate of Conformance (CC) *number or a corresponding CC Addendum Number for devices that have a CC.*

(1) The CC Number or a corresponding CC Addendum Number shall be prefaced by the terms "NTEP CC," "CC," or "Approval." These terms may be followed by the word "Number" or an abbreviation of that word. The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.)
[Nonretroactive as of January 1, 2003]

The required information shall be so located that it is readily observable without the necessity of the disassembly of a part requiring the use of any means separate from the device. (Amended 1985, 1991, 1999, 2000, 2001, 2003, ~~**and,**~~ 2006 **and 2017**)

The amended proposal was Accepted as a Voting item at the 2016 Interim meeting and passed at the 2016 Annual Meeting.

Since the future work on this item depends on the expiration of the window for compliance (2022), the Sector agreed to table this item until 2020/2021, when we can again begin to discuss further modifications with the eventual goal of eliminating G-S.1.1 and the differentiation between built-for-purpose and not-built-for-purpose.

Discussion:
In July of 2016 the MDMD Work Group addressed some of these issues pertaining to software running on small devices such as phones that have very small screens. They discussed prioritization of what needed to be displayed, such as CC so that the remainder of the information can be looked up.

Conclusion: This agenda item remains tabled until 2020.

2. Identification of Certified Software

Source:
NTEP Software Sector

Background:
See the 2016 Software Sector Meeting Summary for more background on this item.

This item originated as an attempt to answer the question "How does the field inspector know that the software running in the device is the same software evaluated and approved by the lab?"

In 2010, the sector recommended the following change to NIST Handbook 44, General Code: G-S.1(d) to add a new subsection (3):

> *(d) the current software version or revision identifier for* ***~~not-built-for-purpose~~*** ***<u>software-based electronic</u>*** *devices;*
> *[Nonretroactive as of January 1, 2004]*
> (Added 2003) **<u>(Amended 20XX)</u>**
>
> *(1) The version or revision identifier shall be prefaced by words, an abbreviation, or a symbol, that clearly identifies the number as the required version or revision.*
> *[Nonretroactive as of January 1, 2007]*
> *(Added 2006)*
>
> *(2) Abbreviations for the word "Version" shall, as a minimum, begin with the letter "V" and may be followed by the word "Number." Abbreviations for the word "Revision" shall, as a minimum, begin with the letter "R" and may be followed by the word "Number." The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.).*
> *[Nonretroactive as of January 1, 2007]*
> (Added 2006)
>
> **<u>(3) The version or revision identifier shall be directly and inseparably linked to the software itself. The version or revision identifier may consist of more than one part, but at least one part shall be dedicated to the metrologically significant software.</u>**
> ***<u>[Nonretroactive as of January 1, 201X]</u>***
> **<u>(Added 20XX)</u>**

Also, the sector recommended the following information be added to NCWM Publication 14 as explanation/examples:

- Unique identifier must be displayable/printable on command or during operation, etc.
- At a minimum, a version/revision indication (1.02.09, rev 3.0a, etc.). Could also consist of / contain checksum, etc. (crc32, for example)

This item was eventually withdrawn. Mr. Darrell Flocken shared his recollection of why the S&T Committee objected to this wording back in 2010. Basically, it went too deep for Handbook 44 and would be better placed in Pub. 14.

In addition, the sector considered the following information to be added to NCWM Publication 14 as explanation/examples:

- The current software identifier must be displayable/printable on command during operation (or made evident by other means deemed acceptable by G-S.1.)
- At a minimum, the software identifier must include a version/revision indication (1.02.09, rev 3.0 a, etc). It could also consist of / contain checksum, etc. (crc32, for example).

- The version or revision identifier may consist of more than one part, but at least one part shall be dedicated to the metrologically significant software.

Other questions previously brought up that have not really been satisfied to date are:

- If we allow hard-marking of the software identifier (the sector has wavered on this in the past), does the above wording then imply that some mechanical means is required (i.e. physical seal) to "inseparably link" the identifier to the software?

- If a device is capable of doing so, does it still have to be able to display, print or communicate the identifier somehow, even if it is hard-marked?

The possibility of creating a separate Publication 14 section specific to software was debated. There are pros and cons in terms of the chances of adoption with that approach. It might be beneficial to manufacturers, due to keeping the requirements in one place. This becomes a philosophical question – is the content of Handbook 44 intended to be a guide to manufacturers, or is it intended as direction to field inspectors? This discussion was tabled for present.

Historically, CC's have been written in terms of "version X and higher". It is not our intention to change that "policy", but it isn't documented anywhere. Perhaps that should be addressed by the Software Sector. Mr. Jim Truex reviewed the administrative policy text, which includes the requirement to report changes to NTEP, based on whether they're metrologically significant.

California indicated that their NTEP lab only puts the software version on the certificate if it's not-built-for-purpose, but it seems that the other labs do so for all software-based devices.

If pushed, the Sectors agreed that a simple defining statement to qualify the class of devices that are to be included would be forwarded to the interested parties:

Software Based Device – Any device with metrologically significant software.

The Software Sector decided that we'd leave the previously withdrawn recommendation as-is, in the hopes that the other changes to G-S.1 will be adopted and then this can be revisited. Several Measuring Sector members and all the labs indicated their support for the language as written.

Regarding field inspection and locating the required information: The list of acceptable menu text and symbols in Appendix A are intended to assist the labs in finding the certification number. The sector noticed no action by the sectors had been taken when this list was circulated for comment. We would like to remind them that we would like to have it reviewed. We feel that this belongs in, for example, the Weighing Device Pub. 14, page DES-22, Section 3; the Belt – Conveyor Scales, page BCS-10, Section 8.7; the Measuring Devices, page LMD-21, Section 1.6; the Grain Moisture Meter, page GMM-14, Section 1 (G.S.1); and Near Infrared Grain Analyzers, page NIR-8, Section 1 (G.S.1).

Mrs. Tina Butcher mentioned that the Weighing Sector has a Weighing Checklist that has a similar set of approved symbols, so the examples shown in Appendix A would be in line with their current practice.

Since the recommended new G-S.1 language was voted on and adopted in 2016, we can now move forward on this item and consider adding to NCWM Publication 14 the specifics that we have been discussing related to presenting the software identification.

Mr. Darrell Flocken asked whether it's a specification or information. That would determine whether it should belong in HB44 or only in Pub. 14. One possibility is below:

(3) The version or revision identifier shall be directly and inseparably linked to the software itself.

Note: The version or revision identifier may consist of more than one part, but at least one part shall be dedicated to the metrologically significant software.

[Nonretroactive as of January 1, 201X]

(Added 20XX)

Concern was expressed that this could cause confusion with field inspectors. Software separation isn't something that's intended to be useful in the field, it is intended to ease type approval and software maintenance release processing. - This would lend weight to the argument of keeping it in Pub. 14.

If the Sector desires to include this in Pub. 14, we would need to identify all the sections where this concept would need to be added. The Software Sector doesn't have the authority to add it to the other sectors' Pub. 14's. Mr. Flocken reported that a note regarding the concept of software separation has already been added to several of the various Pub. 14 sections.

It was also noted that the checklist being developed for the labs currently includes (1.4.3) the requirement that the software version or revision be linked to the software itself.

The Chair proposed that we table Agenda Item 2 until 2021, and that we continue to pursue implementing the checklist in Pub. 14. Mr. Flocken suggested that the Software Sector recommend that the various sectors adopt this for their Pub. 14's. It would take a year or so, to make it through all the various sectors. A note could be added saying that a device can't be rejected if it doesn't meet this requirement in the checklist until 2022. It was agreed that we would table this item until the 2021 meeting, at which time we will propose the following (updated) wording for the 2022 Pub. 14:

3. Additional Marking Requirements- Software

Identification of Certified Software:

The manufacturer must describe and possibly demonstrate how the version or revision identifier is directly and inseparably linked to the metrologically significant software. Where the version revision identifier is comprised of more than one part, the manufacturer shall describe which portion represents the metrological significant software and which does not.

Note: Manufacturers may choose to separate metrologically significant software from non-metrologically significant software. Separation would allow the revision of the non-metrological portion without the need for further evaluation. In addition, non-metrologically significant software may be updated on devices without breaking a seal, if so designed. Separation of software requires that all software modules (programs, subroutines, objects, etc.) that perform metrologically significant functions or that contain metrologically significant data domains form the metrologically significant software part of a measuring instrument (device or sub-assembly). If the separation of the software is not possible or needed, then the software is metrologically significant as a whole.

Discussion:
At the 2017 joint meeting, the MDMD Work Group discussed adding the section regarding linking of identifier to the software to their section in Pub. 14. There were no objections, so Mr. Flocken said he'd add it for next year's publication. A note shall be added that this is voluntary until 2022.

Also, we further discussed the idea of software separation, especially in how it pertains to the difference between the terms "metrologically significant" and "legally relevant". Some legal requirements have nothing to do with metrology. There is a difference in how the U.S. regards this (since each state can have different legal requirements) vs. the philosophy in Europe. There isn't a definition of "metrologically significant" in Handbook 44, but Publication 14 has a description of all the parameters that needs to be sealed, which includes both metrologically significant and legally relevant parameters.

A definition of "metrologically significant" could be helpful, but Mr. Flocken suggested that we make sure it doesn't contradict VCAP's administrative policies.

Handbook. 44 does contain a definition for "metrological integrity".

Type evaluation is the time at which decisions are made regarding which exact parameters are sealable. According to Mr. Jim Truex, the U.S. has never been able to come to a consensus on this subject.

Conclusion:
Mr. Jim Pettinato suggested that we work offline to generate a description intended to provide guidance on what we mean by "metrologically significant". Mr. Pettinato, Mr. Doug Bliss, Dr. Ambler Thompson, and Mr. Kevin Detert volunteered to make up a subcommittee to address this subject.

We also considered the issue of having to adopt a general software requirement to multiple sections of Publication 14 to address essentially the same requirement for each category of device separately. The idea was floated by the Sector that perhaps a new section should be added to Publication 14 specific to software that applies to all metrologically significant software in all devices types that might contain such. Rather than formally suggesting this be done, we decided to informally run the idea past the Specifications and Tolerances committee. That way, if there was little interest or strong objection, we wouldn't waste time generating a draft.

3. Software Protection / Security

Source:
NTEP Software Sector

Background:
See the 2014 Software Sector Summary for additional background on this item.

The Sector continued to develop a proposed checklist for NCWM Publication 14. The numbering will still need to be added. This is based roughly on R 76 – 2 checklist and discussions beginning as early as the October 2007 NTEP Software Sector Meeting. The information requested by this checklist is currently voluntary, however, it is recommended that applicants comply with these requests or provide specific information as to why they may not be able to comply. Based on this information, the checklist may be amended to better fit with NTEP's need for information and the applicant's ability to comply.

The labs using this checklist on a trial basis indicated that there was some confusion as to versions/wording. There may be more than one version in circulation. The version shown in this Summary shall be used henceforth.

During the discussion, Mr. Ed Payne (NTEP lab, Maryland) said that his impression is that this is at least making some of the manufacturers think about security, which they hadn't necessarily done in the past.

It was indicated that some more or better examples may be helpful to manufacturers, and that more guidance is needed. Clearer instructions could be part of the checklist, or it could be a separate document. The Sector would like additional feedback specifically regarding what portions of it are causing confusion.

Due to proprietary issues, the labs can't simply give us direct feedback from the companies they interact with. Mr. Flocken volunteered to obtain information from the labs, aggregate it, and remove any potential proprietary information issues.

The checklist as updated during the 2014 meeting:

1. Devices with Software

1.1.	Declaration of the manufacturer that the software is used in a fixed hardware and software environment. **<u>The manufacturer should indicate whether it's solely software or includes hardware in the system. Can the software be changed after the system has been shipped without breaking a seal?</u> AND**	☐ Yes ☐ No ☐ N/A
1.2.	Cannot be modified or uploaded by any means after securing/verification. **<u>With the seal intact, can you change the software?</u>**	☐ Yes ☐ No ☐ N/A

Note: It is acceptable to break the "seal" and load new software, audit trail is also a sufficient seal.

1.3. The software documentation contains:

1.3.1. Description of all functions, designating those that are considered metrologically significant. ☐ Yes ☐ No ☐ N/A

1.3.2. Description of the securing means (evidence of an intervention). ☐ Yes ☐ No ☐ N/A

1.3.3. Software Identification, including version/revision. **<u>It may also include things like name, part number, CRC, etc.</u>** ☐ Yes ☐ No ☐ N/A

1.3.4. Description how to check the actual software identification. ☐ Yes ☐ No ☐ N/A

1.4. The software identification is:

1.4.1. Clearly assigned to the metrologically significant software and functions. ☐ Yes ☐ No ☐ N/A

1.4.2. Provided by the device as documented. ☐ Yes ☐ No ☐ N/A

1.4.3. Directly linked to the software itself. **<u>This means that you can't easily change the software without changing the software identifier. For example, the version identifier can't be in a text file that's easily editable, or in a variable that the user can edit.</u>** ☐ Yes ☐ No ☐ N/A

2. Programmable or Loadable Metrologically Significant Software

2.1. The metrologically significant software is:

2.1.1. Documented with all relevant (see below for list of documents) information. *The list of docs referred to exists in agenda item 5.* ☐ Yes ☐ No ☐ N/A

2.1.2. Protected against accidental or intentional changes. ☐ Yes ☐ No ☐ N/A

2.2. Evidence of intervention (such as, changes, uploads, circumvention) is available until the next verification / inspection (e.g., physical seal, Checksum, Cyclical Redundancy Check (CRC), audit trail, etc. means of security). ☐ Yes ☐ No ☐ N/A

3. Software with no access to the operating system and/or programs possible for the user. <u>This section and section 4 are intended to be mutually exclusive. Complete this section only if you replied Yes to 1.1.</u>

3.3. Check whether there is a complete set of commands (e.g., function keys or commands via external interfaces) supplied and accompanied by short descriptions. ☐ Yes ☐ No ☐ N/A

3.4. Check whether the manufacturer has submitted a written declaration of the completeness of the set of commands. ☐ Yes ☐ No ☐ N/A

4. Operating System and / or Program(s) Accessible for the User. <u>Complete this section only if you replied No to 1.1.</u>

4.5. Check whether a checksum or equivalent signature is generated over the machine code of the metrologically significant software (program module(s) subject to legal control Weights and Measures jurisdiction and type-specific parameters). **<u>This is a declaration or explanation by the manufacturer.</u>** ☐ Yes ☐ No ☐ N/A

4.6. Check whether the metrologically significant software will detect and act upon any unauthorized alteration of the metrologically significant software using simple software tools (e.g., text editor). **<u>This is a declaration or explanation by the manufacturer.</u>** ☐ Yes ☐ No ☐ N/A

5. Software Interface(s)

5.7. Verify the manufacturer has documented:

5.7.1.	**<u>If software separation is employed, t</u>**he program modules of the metrologically significant software are defined and separated.	☐ Yes ☐ No ☐ N/A
5.7.2.	**<u>For software that can access the operating system or if the program is accessible to the user, t</u>**he protective software interface itself is part of the metrologically significant software.	☐ Yes ☐ No ☐ N/A
5.7.3.	The functions of the metrologically significant software that can be accessed ~~**via the protective software interface**~~.	☐ Yes ☐ No ☐ N/A
5.7.4.	The **<u>metrologically significant</u>** parameters that may be exchanged ~~**via the protective software interface**~~ are defined.	☐ Yes ☐ No ☐ N/A
5.7.5.	The description of the functions and parameters are conclusive and complete.	☐ Yes ☐ No ☐ N/A
5.7.6.	There are software interface instructions for the third party (external) application programmer.	☐ Yes ☐ No ☐ N/A

Mr. Pettinato reiterated the Software Sector's request that the labs continue (or begin) to ask manufacturers whether they're willing to participate in the use of this checklist (on a voluntary basis), and to send their feedback to Mr. Flocken. Ms. Teri Gulke will clean up the checklist and put it in a separate document that can be posted on the NCWM website under the Software Sector's documents.

The contents of the checklist should tie back to requirements in Pub. 14. We originally crafted our checklist from the contents of D-31, so we went back to it to see if we could use it as a starting point for writing our own requirements for Pub. 14.

Though they need to be reworded, of course, the most useful portion of D-31 for our current purposes are probably sections 5.1.1., 5.1.3.2.a., 5.1.3.2.d, and 5.2.6.1. which state, respectively:

> *5.1.1 Software identification*
> *Legally relevant software of a measuring instrument / electronic device / sub-assembly shall be clearly identified with the software version or another token. The identification may consist of more than one part but at least one part shall be dedicated to the legal purpose. The identification shall be inextricably linked to the software itself and shall be presented or printed on command or displayed during operation or at start up for a measuring instrument that can be turned off and on again. If a sub-assembly/an electronic device has neither display nor printer, the identification shall be sent via a communication interface in order to be displayed/printed on another sub-assembly/electronic device.*
>
> *5.1.3.2.a The legally relevant software shall be secured against unauthorized modification, loading, or changes by swapping the memory device. In addition to mechanical sealing, technical means may be necessary to secure measuring instruments having an operating system or an option to load software.*
>
> *5.1.3.2.d Software protection comprises appropriate sealing by mechanical, electronic and/or cryptographic means, making an unauthorized intervention impossible or evident.*
>
> *5.2.6.1 Only versions of legally relevant software that conform to the approved type are allowed for use (see 5.2.5). Applicability of the following requirements depends on the kind of instrument and is to be worked out in the relevant OIML Recommendation. It may differ also depending on the kind of instrument under consideration.*

The question was again asked, do these new requirements need to go into a new appendix specific to software in Pub. 14? Do we need to document new requirements at all if the checklist is put into Pub. 14? It could be considered that the checklist itself constitutes the new requirements. Mr. Flocken and Mr. Truex supported that interpretation.

At the 2016 meeting, we learned that the Grain Analyzer Sector's labs have not had the opportunity to try using the checklist because they didn't meet in 2015. Mr. Tom Buck (Ohio) reported that they've been giving the checklist to manufacturers but haven't been getting them back. Mr. Flocken has two examples, one for built-for-purpose and one for a not-built-for-purpose device. Jason Jordan from GIPSA said that they'd try it out. Mr. Bliss and Mr. Pettinato have volunteered to answer any questions that might arise as the labs attempt to use the checklist.

The Sector asked that the revised checklist continue to be used by the labs.

Discussion:
As we meet with each Sector jointly, we can get an updated report on the trial and decide if we're ready to recommend it for Pub. 14. We can also look at the language from D-31 in more detail in an effort to craft guidance in line with NCWM/NTEP philosophy.

This checklist was discussed during the NTEP lab meeting, and Mr. Flocken received two submissions. One response was very helpful, and the other one said that everything was N/A pertaining to their device, except for a bit regarding calculating the CRC and sealing. In general, the labs said that even when they hand the checklist out, they usually don't get it back. We're pushing the labs to be a bit more proactive.

MDMD has only one lab. All the labs have been given a copy of the checklist, but we're not sure whether their lab has found it helpful.

Conclusion:
Darrell Flocken will continue to be a point of contact if businesses or the labs have questions, but no one has yet contacted him in that regard.

Again, the benefit of a separate section of Pub. 14 for software is evident for this agenda item.

4. NTEP Application for Software and Software-based Devices

Source:
NTEP Software Sector

Background:
The purpose of initiating this item was to identify issues, requirements and processes for type approving Type U device applications. It was suggested that it may be useful to the labs to devise a separate submission form for software for Type U devices. What gets submitted? What requirements and mechanisms for submission should be available? Validation in the laboratories - all required subsystems shall be included to be able to simulate the system as installed.

Mr. Roach (California Division of Measurement Standards) stated that if the software package being evaluated supports platforms/subsystems from multiple manufacturers, testing should be done using at least two platforms/subsystems. Scale laboratories and scale manufacturers indicated that this is not usually done for scale evaluations.

Since the NTEP Committee passed the related item at NCWM Annual Meeting we will continue to work on this. Mr. Truex (NTEP Administrator) indicated that we can move in this direction, but felt that it was somewhat premature to develop this thoroughly now. At the point where the sector has developed checklist requirements, then we could move to perhaps add a subsection to current NTEP applications for applicable software. (Refer to D-31.6.1) It was also agreed that there seems to be no reason for limiting the scope of this item to software-only applications, and hence all software/software-based devices could benefit from an enhanced application process.

Comments given at the meeting indicate that current practice does not require anything different for software / software based devices compared to any other type approval. It was also noted that for international applications, OIML D-31.6.5 states, "The approval applicant is responsible for the provision of all the required equipment and components." This would likely also be the policy of NTEP.

Since the checklist is still being tried out by some of the laboratories, the sector is not quite ready to develop this fully. Some documentation that eventually might be required by applicants could include (from WELMEC doc. 7-2 Issue 4): This is the list of documents referred to in the checklist.

- A description of the software functions that are metrologically significant, meaning of the data, etc., e.g. an architecture diagram or flowchart.
- The software identification (version, revision, etc.) and how to view it.
- An overview of the security aspects of the operating system, e.g. protection, user accounts, privileges, etc.

Mr. Flocken and Mr. Truex reviewed existing documentation required for obtaining certification in NCWM Pub. 14, administrative policy, and the application, to see what is already required. Administrative policy 9.1.7 was where this was found:

- Engineering specification
- Operating descriptions that characterize the type

NTEP evaluators already have the authority to request whatever documentation they need. We can provide them with a list of documents that we think would assist the evaluator in his job and also give the manufacturer a good idea of what they should be capable of providing.

Mr. Flocken suggested that this list could be added to administrative policy 9.1.7 in Pub. 14. Jim Truex suggested it could also be added to the application.

If we combine the two lists, it might appear as something like this:

- A description of the software functions that are metrologically significant, meaning of the data, etc., e.g. an architecture diagram or flowchart.
- A description of the user interface, communication interface, menus, and dialogs.
- The software identification (version, revision, etc.) and how to view it.
- An overview of the system hardware, e.g. topology block diagram, type of computer(s), type of network, etc, if not described in the operating manual.
- An overview of the security aspects of the operating system, e.g. protection, user accounts, privileges, etc.
- The operating manual.
- Engineering specification.
- Operating descriptions that characterize the type.

A statement could be made along the lines of, "If not included in the operating manual, provide the following, as applicable."

After the last sentence in 9.1.7, this could be added:

As part of the type evaluation submission, the following information should be provided for software-based devices:

- **A description of the software functions that are metrologically significant, meaning of the data, etc., e.g. an architecture diagram or flowchart.**

- **The software identification (version, revision, etc.), how to view it, and how it is tied to the software.**

- **An overview of the security aspects of the operating system, e.g. protection, user accounts, privileges, etc.**

These documentation requirements will be considered as input for requirements that will eventually appear in NCWM Publication 14 and the application paperwork. Further work by the Sector to develop the NCWM Publication 14 requirements is needed, after more input from the labs is gathered. The Sector recommends including the above bulleted list as an introduction to the checklist as part of our recommendation to include the checklist from agenda item 3 in NCWM Pub. 14. As a description of the accuracy of the measuring algorithms, simply declaring the type and class being aimed for may be sufficient. This list should reflect the needs of the labs for an evaluation. The bulleted list and the paragraph before it should be brought to the labs for an initial review and their input.

There may be concerns with disclosure of proprietary information. Jim Truex says that the labs already protect other proprietary information. If the information provided is sufficiently high level, even theft of the data shouldn't cause too much of a concern.

While working on writing requirements for NCWM Pub. 14 from the checklist we've designed, we considered altering the second bullet point in our proposal for 9.17, so that it will require a description of how the software version or revision identifier is tied to the software itself.

At the 2016 meeting, it seemed that the goal of this agenda item has somewhat shifted back to the original purpose, which is how do we communicate to applicants the expectations related to software based devices? Diane Lee suggested we review the OIML requirements for documentation. The comment was made from the floor that OIML may go further than we are currently prepared to recommend. Mr. Jordan expressed his opinion that moving forward with this item will be helpful for the labs. Mr. Flocken and Mr. Truex think this should be added to the Application section. If limited to that section, it shouldn't require approval from any of the other Sectors. Mr. Bliss suggested that it might be easier to provide examples that do not meet acceptable standards.

As we began discussing the training of field inspectors, Mr. Flocken asked that we also provide further training for lab inspectors. There's an annual lab meeting typically around April, in 2017 it will be in Annapolis, Maryland.

Discussion:
The Software Sector's recommendation is to add the requirements to the Application section. The Software Sector agreed to provide support for any desired training of lab personnel at the April meeting.

Mr. Pettinato suggested that this agenda section has become largely redundant to the previous agenda section (the checklist). As time has passed, we've begun to address software the same regardless of its platform. Built-for-Purpose and Not-Built-for-Purpose differentiation seems less relevant. Mr. Bliss pointed out that we still need to address how to communicate these issues to manufacturers. For now, we will continue with two different agenda items since the contents of the checklist are a separate issue from how we want to address / communicate the requirements.

As previously stated in earlier meetings, the labs can ask for any documentation they like, but it would be good to give manufacturers advance notice. Part of the Technical Policy (NTEP or individual codes) could include a requirement to fill out the checklist. Mr. Truex suggested our best path forward may be to take the checklist (once we're sure it's mature) to the NTEP committee and ask them to add it to their policy.

Though we haven't thoroughly considered adding this to Hdbk. 44, Mr. Flocken pointed out that there is a portion of the handbook that pertains only to type evaluation.

Mr. Truex's suggestion is probably the option with the best chance of success, but it will require some convincing. Mr. Bliss suggested that we may need to put together a presentation like what we did for the adoption of our G-S.1 wording.

9.3 of Administrative Policy describes how to prepare for type evaluation. It might be better to add our suggested wording there instead of 9.1.7. Mr. Pettinato found a page on NCWM's website that describes what's needed for a type evaluation. He suggested we could add our checklist to the list of documents there. The NTEP Committee decides what's posted on the website.

Mr. Truex thinks we may need to come up with a list of software parameters and functions that are required to be protected. This will be a lot of work, but it may be the right answer, generating a separate section in NCWM Pub. 14 (and/or HB. 44) pertaining specifically to software.

Mr. Flocken suggested we create a new agenda item for addressing the NTEP Committee. They meet 4 times a year. In fact, they meet 2 weeks from now (after the NUMA meeting) in Saratoga Springs, New York. Thereafter they meet in July.

Mr. Truex said that he doesn't think that the software security concept has progressed far enough for it to be adopted in any formal manner.

The group discussed whether a list of sealable parameters should include device-specific parameters as well as software-specific parameters (e.g. CRC), or only the latter. The latter should be a fairly short list, including such parameters as:

- Replacing software
- Access to critical sections of the software

Historically, requirements for software-only applications haven't been as high as requirements for software applications that include hardware. The number of software-only applications has increased dramatically over the last few years.

The topic arose once again that we propose to the NTEP Committee we add a software specific section to Pub. 14. We may not know exactly what we want to include, but we could get the ball rolling by presenting a set of examples of situations that show the need. Jim Truex thinks that the NTEP Committee will ask whether this needs a change to Hdbk. 44. We need to address that in any sort of presentation we make to them. Dick Suiter suggested that we add a requirement to HB44 that the software be sealable, which is a bit of a difference from making changes to software evident. G-S.2. appears to address this in its mention of avoiding facilitation of fraud. The philosophy of sealing and method of sealing also cover this. We want to recommend adding a separate section to NCWM Pub. 14 for software, a list of sealable parameters, explain that going to the separate sectors isn't working, and explain that manufacturers will need to address both our software section as well as application-specific portions of NCWM Pub. 14.

Conclusion:
We will provide an outline for the proposed Pub 14 section prior to the meeting in two weeks, to run past the NTEP Committee to get their feedback. We want to make sure this is a viable approach, in their opinion.

5. Training of Field Inspectors

Source: NTEP Software Sector

Background:
During discussions at the 2009 NTEP Software Sector Meeting, the sector concluded that a new agenda item should be initiated specific to the training of field inspectors in relation to evaluating/validating software-based devices.

California has an Examination Procedure Outline (EPO) that begins to address this. Use California Handbook 112 as a pattern template for how it could read.

Items to be addressed:

- Certificate of Conformance

- Terminology (as related to software) beyond what is in NIST Handbook 44.
- Reference materials / information sources

System Verification Tests

NOTE: Item numbers 1 through 5 apply to both weighing and measuring devices. Numbers 6 and 7 are specific to weighing devices; while numbers 9 and 10 apply to measuring devices.

1. Identification. The identification (ID) tag may be on the back-office server and could be viewed on an identification screen on the computer monitor. The ID information may be displayed on a menu or identification screen. Though currently discouraged, some systems may be designed so the system must be shut down and reset to view the ID information. G-S.1 (1.10)

   1.1. Manufacturer.

   1.2. Model designation.

   <u>**1.3 Software version/revision**</u> (added at the 2017 Software Sector meeting)

2. Provisions for sealing. G-S.8 [1.10]; S.1.11 [2.20]; S.2.2 [3.30]

   2.1. Verify sealing category of device (refer to Certificate of Approval for that system).

   2.2. Verify compliance with certificate.

3. Units of measure.

   3.1. A computer and printer interfaced to a digital indicator shall print all metrological values, intended to be the same, identically. G-S.5.2.2(a); G-S.5.1 [1.10]

   3.2. The unit of measure, such as lb, kg, oz, gal, qts, liters, or whatever is used, must agree.

4. Operational controls, indications and features (buttons and switches). Verify that application criteria and performance criteria are met (refer to Certificate of Approval).

   4.1. Any indication, operation, function or condition must not be represented in a manner that interferes with the interpretation of the indicated or printed values.

5. Indications and displays.

   5.1. Attempt to print a ticket. The recorded information must be accurate or the software must not process and print a ticket with erroneous data interpreted as a measured amount.

Weighing Devices

6. Motion detection.

   6.1. For railway track, livestock, and vehicle scales apply or remove a test load of at least 15d while simultaneously operating a print button, push-button tare or push-button zero. A good way to do this is to try to print a ticket while pulling the weight truck or another vehicle onto the scale. Recorded values shall not differ from the static display by more than 3d. Perform the test at 10%, 50% and 100% of the maximum applied test load. S.2.5.1(a) [2.20]; EPO NO. 2-3, 2.4

   6.2. For all other scales, apply or remove at least 5d. Printed weight values must agree with the static weight within 1d and must exactly agree with other indications. S.2.5.4(b) [2.20]; EPO NO. 2-3, 2.4

7. Behind zero indication.

   7.1 Apply a load in excess of the automatic zero setting mechanism (AZSM) and zero the scale. S.2.1.3 [2.20]; EPO NO. 2-3, 2.4, 2.5.2

   Example: On a vehicle scale have someone stand on the scale, then zero them off (AZSM is 3d). Remove the weight (person) and note the behind zero display (usually a minus weight value) or error condition.

   7.2. Attempt to print a ticket. With a behind zero condition, (manually or mechanically operated) a negative number must not be printed as a positive value.

8. Over capacity.

   8.1. Manually enter a gross weight if permissible or apply a test load in excess of 105% of the scale's capacity. S.1.7 [2.20]; S.1.12, UR.3.9 [2.20]

   8.2. Attempt to print a weight ticket. A system must not print a ticket if the manually entered weight or load exceeds 105% of the scale capacity.

Measuring Devices

9. Motion detection.

   9.1. Initiate flow through the measuring element. Attempt to print a ticket while the product is flowing through the measuring chamber. The device must not print while the indication is not stable. S.2.4.1. (3.30)

10. Over capacity.

    10.1. Attempt to print a ticket in excess of the indicated capacity. A system must not print a ticket if the device is manually or mechanically operated in excess of the indicated value.

NOTE: Be aware of error codes on the indicator which may be interrupted as measured values.

Mr. Jordan (California Division of Measurement Standards), is already doing something similar, and he may be able to assist. Mr. Roach (California Division of Measurement Standards) will talk to him to see whether they're available. In addition, Mr. Parks (California Division of Measurement Standards) is based in Sacramento and a potential resource. If the meeting is held in Sacramento next year, they may be able to attend.

Mr. Truex (NTEP Administrator) pointed out that the PDC would also be a valuable resource on this subject. Mr. Pettinato, Co-Chair, will contact them.

**NIST Handbook 112- Examination Procedure Outline for Commercial Weighing and Measuring Devices.*

The PDC is focused on training sessions at the moment, so it's unsure how much time they'd have to review this currently.

It was suggested by Mr. Truex and Mr. Flocken we make it part of our report as an attachment or an appendix of the meeting minutes. Then we can send out an email notifying the Software Sector members as to where to find it.

Alternatively, we could forward the document to the PDC Committee, tell them it was our starting point, and ask them for their suggestions.

The Sector would like to continue exploring means by which it can be of assistance in training of field inspectors as software and electronic systems become more and more prevalent in their daily tasks.

It was also suggested we contact Mr. Ross Andersen, a paid consultant working with the PDC Committee, to ask his opinion on how the Software Sector could best proceed to assist in the training of field inspectors. The Sector chair, Mr. Pettinato, will act as primary point of contact for this communication.

For the Grain Analyzer Sector, Ms. Diane Lee thought it would take some time to put together some training material, as they do not currently have anything in place for software requirements.

Examples from completed checklists would be very helpful when putting together field inspector training. A lot of training videos have been recently generated. Mr. Doug Musick suggested that we recommend adding this to the agenda for the PDC Committee. Certification exams could be updated more easily, on a state-by-state level. It might be better to make software a separate exam.

Ms. Lee suggested we look at developing a basic course for software, incorporating specific guidelines for specific device types.

Ms. Amanda Dubin was concerned about having the field inspectors know all the different existing software, which is a monumental task. Instead, the training should focus on how to find the pertinent CoC and look up information from it on the website. Ideally, down the road there could be some sort of database or software tool disseminated to field inspectors to assist in the look up of certificate numbers and the approved version number(s) for the software for a particular device, and even instructions on how to view/print the audit trail.

Mr. Truex holds a meeting once a year for the lab evaluators. Mr. Flocken suggested that we also focus on training them on software. Ms. Lee mentioned that NIST has been having manufacturers coming in to provide training on, for example, how to access the audit trail.

Discussion:
A video explaining the different sealing requirements was developed several years ago. It was intended for inspectors. NIST has given this video out at several training sessions.

The very first thing a field inspector needs to do is determine whether the software/system is metrological. Jim Truex said that they need guidance in figuring this out.

Inspectors are trained to look for a CC and look it up. A lot of the time this occurs during initial implementation of new equipment.

Not all devices are evaluated by NTEP, so they won't have a CC. That might be because NTEP hasn't established an evaluation for that type of device yet.

There are only 4 states that don't participate in NTEP. Two of those do participate informally (not legally required).

Conclusion:
Mr. Pettinato suggested that at least for the short term, we work with California on an EPO.

6. Retrieval of Audit Log information

Source:
Adam Oldham, Gilbarco

Background/Discussion:
The current requirements for a Category III audit trail include printing of log on demand. However, many devices are approved standalone and can be connected to systems that are approved standalone. How could Category 3 audit trail mechanisms be approved in situations where multiple devices need to work together to attain it? How can a device maintain Category 2 and 3 approvals in this scenario? What alternatives to printing can be considered as potentially valid solutions? (files, laptop, flash drive, etc.).

This was discussed during the Measuring Sector's meeting on 9/15. The wording suggested was not agreed upon. Mr. Oldham would like to have the Software Sector's suggestions, so he can put together a proposal for next year.

The U.S. has rather unique requirements for printing the Category 3 audit trail, which are quite unwieldy – both in terms of the actual printing process (and results), as well as the needed approvals (the example provided by Mr. Oldham required an approval for each and every POS system that might be connected to their system). The most similar is from Mexico, but they require an electronic copy.

Mr. Flocken reported that there has been a little movement forward – alternative methods are now allowable, to some degree, but it's dependent on what the states are going to allow, and it still requires the ability to print it. The change will be in LMD Code S.2.2., not in Handbook 44 G-S.2.2.

We discussed the difficulty of requiring that the electronic data be printable on-site, given that some sites don't have any printers, and other sites may have printers attached to computers that are restricted in what can be used to attach to them.

In Mexico, Gilbarco relies upon laptops being present, supplied by the auditing company.

LMD Pub. 14 has a section in Appendix B Requirements for Metrological Audit Trails on the event logger, and that information doesn't seem to be in Handbook 44. In fact, it may even contradict what's in the LMD Pub. 14. In practice, what's in Pub. 14 tends to be more influential with evaluators.

Mr. Oldham volunteered to work on the wording for a proposal to present at the 2016 Software Sector meeting for review, but was not in attendance at the meeting, so the item was tabled.

The chair has anecdotal evidence that other parties have also expressed interest in specifying alternate methods for distributing audit trail information aside from the current 'printing' requirements. This discussion should be continued at the 2017 meeting.

Discussion:
In 2016 the Conference worked on some changes, but some states don't care for them. Previously only printouts were allowed, but now an "alternate method" is potentially allowed if all parties agree. Jim Truex thinks this issue has moved as far forward as it probably will for the time being.

Mr. Flocken suggested that if/when we get a separate software section added to Pub. 14, we ensure that our wording match the other similar sections in Pub. 14.

Conclusion:
This agenda item was closed by the Sector.

NEW ITEMS

7. Use of GPS Receivers and Mapping Software for Trade (e.g. fare determination)

Source: Software Sector

Background:
See the 2016 Software Sector Meeting Summary for additional background.

There were a few presentations at the Interim Meeting on this subject. The 2016 Annual Meeting archive (Denver 2016) includes a presentation from Lyft from that meeting.

Dr. Ambler Thompson has discussed this subject with European officials. One issue is traceability of the time stamp(s). You can also calculate velocity based upon the phase shift of the GPS signal, though it requires a high-end, survey-grade GPS receiver ($50k each). Car companies can use these devices to obtain a great deal of data.

Uber and Lyft claim that they are not billing upon GPS data, but rather a pre-negotiated contract based upon distance, time, and type of vehicle. Mr. Bliss has been told that the bill is based upon the starting GPS location from the driver's phone, the ending GPS location from the same phone, and a calculation of the shortest distance from Google Maps. If the driver's phone doesn't have a great GPS receiver, or if the reception is bad so it's relying upon cell towers, etc., that's a problem. We're also not sure just how accurate Google Map's route calculation is. Also, Google Maps is a disinterested third party whose database is being used for a purpose they didn't specifically authorize.

Discussion:
Both Uber and Lyft provided presentations at the 2017 Interim Meeting to address some of the concerns that have been raised.

There is a U.S. working group devoted to this subject now. There are three commercial parties – the driver, the rider, and the company itself. The driver is the one providing the phone that is relied upon for measuring the time and distance. There is an option for an up-front fare, which doesn't fall under W&M jurisdiction. The driver's compensation is based upon time and distance, so that is pertinent for W&M, as is the rider's cost if a destination isn't provided. Google Maps isn't being evaluated, just the Uber/Lyft software. The focus for testing is inputs and outputs.

GPS data is traceable by NIST, which accounts for a different approach between the US and Europe. Google Maps is not traceable.

There are two proposals before the S&T Committee pertaining to these systems. One is for transportation management systems (i.e. Uber and Lyft), and if approved it would be on a test basis; systems wouldn't be red-tagged based upon it yet. The other one is for amending the existing taxi meter code to address these systems. Both will be voted upon in July. There's a third item, but it isn't as extensive of the other two items.

Conclusion:
At this stage, there isn't much for the Software Sector to do on this subject. Mr. Pettinato asked that the members of the Software Sector review the proposals in Pub. 16 pertinent to this issue.

8. Next Meeting

Background:
The sector is on a yearly schedule for NTEP Software Sector Meetings. Now that we've adopted a joint meeting system, the next Sector joint meeting will coincide with one of the remaining Sector meetings.

Everyone thinks that the joint sessions have been productive; however, Mr. Flocken pointed out that if we do get a separate software section in NCWM Pub. 14 we may want to have a separate working session to work out wording/terminology before meeting with the other sectors for feedback.

If we stick with the same rotation, the Weighing Sector would be the next meeting, though that would a year and a half from now. The MDMD Work Group will meet again in May 2018, and they're asking that we meet with them again since they anticipate a lot of changes in their functionality in that time. There is less pressure to meet right before regional meetings because we aren't currently proposing changes to Hdbk. 44 though our proposal to the NTEP Committee might have to go through the regionals.

Conclusion:
After some consideration, we decided we would meet with the Weighing Sector in August 2018.

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Appendix F

National Type Evaluation Program (NTEP) Weighing Sector Meeting Summary

August 22-23, 2017
Houston, TX

INTRODUCTION

The charge of the NTEP Weighing Sector (WS) is important in providing appropriate type evaluation criteria based on specifications, tolerances, and technical requirements of NIST Handbook 44, "Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices," Sections 1.10. General Code, 2.20. Scales, 2.22. Automatic Bulk Weighing Systems, and 2.24. Automatic Weighing Systems. The Sector's recommendations will be presented to the National Type Evaluation Program (NTEP) Committee each January for approval and inclusion in NCWM Publication 14, "Technical Policy, Checklists, and Test Procedures" for national type evaluation.

The Sector is also called upon occasionally for technical expertise in addressing difficult NIST Handbook 44, issues on the agenda of National Conference on Weights and Measures (NCWM) Specifications and Tolerances (S&T) Committee. Sector membership includes industry, NTEP laboratory representatives, technical advisors, and the NTEP Administrator. Meetings are held annually, or as needed and are open to all NCWM members and other registered parties.

Proposed revisions to the handbook(s) are shown as follows: 1) deleted language is indicated with a **bold face font using ~~strikeouts~~** (e.g., **~~this report~~**), 2) proposed new language is indicated with an **underscored bold-faced font** (e.g., **new items**), and 3) nonretroactive items are identified in ***italics***. There are instances where the Sector will use **red** text and/or text to bring emphasis to text that requires additional attention. When used in this report, the term "weight" means "mass."

Note: It is the policy of the National Institute of Standards and Technology (NIST) to use metric units of measurement in all of its publications; however, recommendations received by NCWM technical committees and regional weights and measures associations have been printed in this publication as submitted. Therefore, the report may contain references in U.S. customary units.

Table A
Table of Contents

Title of Contents	Page

Table B
Glossary of Acronyms and Terms

Acronym	Term	Acronym	Term
ABWS	Automatic Bulk Weighing Systems	NCWM	National Conference on Weights and Measures
AREMA	American Railway Engineering Maintenance-of-Way Association	NIST	National Institute of Standards and Technology
AWS	Automatic Weighing Systems	NTEP	National Type Evaluation Program
CC	Certificate of Conformance	OIML	International Organization of Legal Metrology
DES	Digital Electronic Scales	OWM	Office of Weights and Measures
HB 44	NIST Handbook 44	R	Recommendation
IZSM	Initial Zero-Setting Mechanism	SS	National Type Evaluation Program Software Sector
LMD	Liquid Measuring Device	S&T	Specifications and Tolerances Committee
MC	Measurement Canada	SMA	Scale Manufacturers Association
MRA	Mutual Recognition Agreement	WS	National Type Evaluation Program Weighing Sector

Details of All Items
(In order by Reference Key)

CARRY-OVER ITEMS

1. Recommended Changes to NCWM Publication 14 Based on Actions at the 2017 NCWM Annual Meeting

Source:
Mr. Richard Harshman (NIST Technical Advisor) will provide the Sector with specific recommendations for incorporating test procedures and checklist language based upon actions of the 2017 NCWM Annual Meeting. The Sector is asked to briefly discuss each item and, if appropriate, provide general input on the technical aspects of the issues.

1.a. 3200-2 Verification Scale Interval

Source:
2017 S&T Committee Final Report

Background/Discussion:
At its 2017 Annual meeting, the NCWM voted to add a new NIST Handbook 44 Scales Code subparagraph S.1.2.2.2. Class I and II Scales used in Direct Sales, which requires the value of the scale division (d) to be equal to the value of the verification scale interval (e) on all Class I and II scales used in a direct sale application. The new subparagraph that was adopted is shown below. It is non-retroactive as of January 1, 2020, to be become retroactive January 1, 2023.

S.1.2.2.2. Class I and II Scales used in Direct Sales. When accuracy class I and II scales are used in direct sale applications the value of the displayed division "d" shall be equal to the value of the verification scale interval "e."

(Added 2017) ***(Nonretroactive as of January 1, 2020. To become retroactive as of January 1, 2023***

Note that existing Scales Code subparagraph S.1.2.2.2. Class III and IIII Scales was renumbered S.1.2.2.3. as a result of adding this new subparagraph to the Handbook.

OWM's understanding of new subparagraph S.1.2.2.2. is that it will require the value of the scale division (d) to be equal to the value of the verification scale interval (e) on Class I and II scales manufactured as of January 1, 2020, when these scales are used in direct sale applications. Additionally, the value of "d" and "e" will be required to be equal on all Class I and II scales used in a direct sale application as of January 1, 2023, regardless of when they were manufactured.

OWM's review of some active NTEP CC's corresponding to Class I and II scales in the NCWM NTEP CC database revealed that within some of the tables providing indication of specific models, capacities, and division values for a particular scale, there exists certain models/types of Class I and II scales in which the value of "d" and "e" are different and other models in which they are the same. For example, consider the entries in the table below copied from NTEP CC number 05-078A2, which corresponds to a Mettler-Toledo Non-Computing Counter/Bench, Digital Electronic scale:

Specific Models, Capacities, and Division Sizes

Model/Type	Capacity	e	d	Class
JL602-G/Ayy	610 g	0.1g	0.01g	II
JL802-G/Ayy	810 g	0.1g	0.01g	II
JL1103-C/Ayy	220 g /1100 ct	0.001 g / 0.001 ct	0.001 g / 0.001 ct	I
JL1501-G/Ayy	1510 g	0.1 g	0.1 g	II
JL3001-G/Ayy	3100 g	0.1 g	0.1 g	II
JL6001-G/Ayy	6100 g	1 g	0.1 g	II
JL6001-G/LAyy	6100 g	1 g	0.1 g	II

Based on OWM's interpretation of new subparagraph S.1.2.2.2., the first- and last- two models of scales shown in this table could not be placed into a direct sale application (as of Jan. 1, 2020) because the manufacturer has designated a different value of "d" than "e." It would not be permissible for someone to simply turn off (or disable) the "d" resolution on one of the scale models referenced in this table in which the "d" value is different than the "e" value and change the marking to indicate that the value being displayed is "d." It would, in fact, be of concern if someone were to be able to simply turn off or deactivate the "d" resolution and change the marking on a scale to reflect that the value being displayed is "d" instead of "e" because it is OWM's understanding that deactivation of a "d" resolution on a Class I or II scale equipped with a value of "d" that differs from "e" causes a scale roundoff problem on some scales. That is, once the "d" resolution has been deactivated, "e" values do not round to the nearest minimum increment, which subparagraph G-S.5.2.2. Digital Indication and Representation requires. Thus, it is a reasonable expectation, in OWM's judgement, that the proposal requires the value of "d" and "e" to be equal.

Technical Advisor's note: OWM checked with one U.S. scale manufacturer concerning whether or not the Class I and II scales they currently produce would round properly if the "d" resolution were disabled (or deactivated) on those Class I and II scales in which the value of "d" differed from "e." The manufacturer reported that there is no possible way of disabling the "d" resolution on any of the models of Class I and II scales that they manufacture in which the value of "d" and "e" are different. It should not be concluded, however, from the reporting of one scale manufacturer that the "d" resolution on scales produced by other U.S scale manufacturers cannot be deactivated, and if it can be, whether or not the "e" resolution would round properly.

Due to the possible roundoff problem created by deactivating a "d" resolution on a Class I or II scale equipped with a value of "d" that differs from "e," OWM plans to submit a new NCWM Form 15 proposal to add a new subparagraph beneath S.1.2.2. Verification Scale Interval to be considered in the next Conference cycle. The following draft subparagraph was developed by OWM for submission to the NCWM for consideration:

> **S.1.2.2.3. Deactivation of a "d" Resolution. - It shall not be possible to deactivate the "d" resolution on a Class I or II scale equipped with a value of "d" that differs from "e" if such action affects the scale's ability to round digital values to the nearest minimum unit that can be indicated or recorded as required by paragraph G-S.5.2.2.**

OWM believes new paragraph S.1.2.2.2. is consistent with OIML R 76 Non-automatic weighing instruments, which prohibits the use of an auxiliary indicating device (e.g., an indicating device with a differentiated scale division) and extended indicating device (e.g., expanded resolution) for direct sales to the public.

Recommendation:
No specific recommendation is being made to the Sector at this time because it is believed the adopted changes to the Scales Code do not impact any of the type evaluation criteria in NCWM Publication 14. Members of the Sector should, however, consider the impact of these changes when considering the sale of high accuracy scales that are destined for or could eventually find their way into direct sale applications. The NIST advisor believes a discussion on how non-retroactive requirements apply and the impact of including a date in which the new

requirement becomes retroactive might be beneficial to some members of the Sector. A review of the Handbook 44 definition of "direct sale" might also be helpful.

Discussion:
Mr. Harshman provided a brief summary of the purpose of new NIST HB 44 Scales Code paragraph S.1.2.2.2. and OWM's interpretation of how the paragraph is intended apply to Class I and II scales used in a direct sale application once the requirement becomes enforceable (i.e., as of the effective date of the paragraph). OWM's interpretation of the paragraph is that the value of "e" and "d" would have to be equal on Class I and II scales placed into commercial service as of January 1, 2020, if the application of those scales is for direct sale (a "direct sale" is defined as a sale in which both parties in the transaction are present when the quantity is being determined). Additionally, all Class I and II scales used in a direct sale application would have to comply with the paragraph once the paragraph becomes retroactive on January 1, 2023. Mr. Harshman noted that the paragraph does not allow for the simple deactivation of the "d" resolution on a scale with a value of "d" that differs from "e" to make possible the use of the scale in a direct sale application because the paragraph explicitly specifies, "the value of the displayed division "d" shall be equal to the value of the verification scale interval "e."

Mr. Harshman reported that in OWM's analysis of this item, it had learned that some Class I and II scales in which the value of "e" and "d" differ, may not round properly if the "d" resolution is disabled so that only the "e" value is displayed. That is, some scales may not round to the closest value of "e" once the "d" resolution is disabled as required by HB 44 G-S.5.2.2. Digital Indications and Representation. For this reason, OWM planned to submit a new NCWM Form 15 proposal to add a new paragraph into the Scales Code for consideration during the 2018 NCWM cycle that would prohibit the deactivation of the "d" resolution if, once deactivated, it causes the "e" resolution to round improperly.

Mr. Pascal Turgeon (MC) noted that the "d" resolution allows for a more accurate weight determination because it allows a scale operator to read indications to a more precise value (i.e., a value between verification scale intervals). Limiting the scale display to indicate only the verification scale interval (e) would offset any benefit gained in reducing confusion concerning the appropriate value to use for the basis of a commercial transaction because it decreases the precision by which a scale may be read.

During the discussion, it was acknowledged by several members of the Sector that scale manufacturers of Class I and II scales equipped with a value of "d" that differs from "e" never intended for the "d" resolution to be used for the basis of commercial transaction. It was also noted that OIML R 76 Non-automatic weighing instruments does not allow the use of the "d" resolution on scales used for direct sales to the public. Mr. Darrell Flocken (NCWM NTEP Specialist) and Mr. Harshman exchanged views on the differences between a "d" resolution (on a scale equipped with a value of "e" that differs from "d") and an expanded resolution on a scale designed for the expanded resolution to be displayed. They agreed that the two were intended for different purposes.

Mr. Harshman, referencing a concern made evident by one of the NTEP Lab evaluators during the lab meeting held earlier the same day, noted that new paragraph S.1.2.2.2. could create a potential problem for the NTEP labs. This is because some NTEP labs may not have error weights (also sometimes referred to as "flip" weights) small enough to be able to conduct testing in accordance with "standard practice" procedures currently used by the NTEP labs. Current testing procedures allow an evaluator to use the "d" resolution (instead of using error weights), when testing Class II scales equipped with a value of "d" that differs from "e," to determine the precise amount of error in the scale at the different test points of applied test load. If there is no "d" resolution displayed on a scale submitted for type evaluation (because it has been disabled or deactivated) and the value of "e" is small, some labs won't have the error weights necessary to make possible error determinations to values less than the displayed scale increment (e). Mr. Harshman stated, because of this concern, that he believes the impact of this new paragraph may not be fully understood and the Sector may need to revisit this issue in the future. *Technical advisors note: The State of New York had reported earlier that its smallest test weight available for use in the lab is ten milligrams. Ohio reported its smallest test weight is one milligram.*

Mr. Jerry Wang (A&D Engineering, Inc.) questioned whether paragraph S.1.2.2.2. allowed for the manufacturing of a single scale to serve both applications (i.e., direct sale application and non-direct sale application) providing the function for selecting the application is secure (located behind the security seal or other means of security). Mr. Flocken and Mr. Harshman both stated they believed the paragraph would allow for this; although, the NTEP

Certificate of Conformance for the scale would need to identify the two applications in such a way that officials could easily tell which applied to scales being inspected in the field.

No action was taken by the Sector on this item, although the Sector may wish to revisit this item in the future if the need develops.

2. NCWM Publication 14 DES Section 31 Multi-Interval Scales

Source:
Measurement Canada/Canada (2015)

Background:
This item appears as Agenda Item 10 on the 2015 NTEP Weighing Sector Agenda. During the 2015 Weighing Sector Meeting, Mr. Pascal Turgeon (MC) identified conflicts in various parts of NCWM Publication 14, DES Section 31. Multi-Interval Scales and suggested some changes be made to NCWM Publication 14 based on the type evaluation criteria developed and used by MC in their evaluation of a tare feature on a multi-interval scale. The conflicts identified by MC were disclosed during a routine general maintenance of the Canadian documents, and in particular, the requirements pertaining to multi-interval scales. Noting the importance of being careful not to change something that could conflict with Handbook 44 or NCWM Publication 14 because of the US and Canadian Mutual Recognition Agreement, MC requested an interpretation of the following sections of NCWM Publication 14, which it viewed as conflicting:

- The preamble to Section 31. contains examples and clauses that conflict with the requirements set out in 31.1. and 31.2. For example, the tare calculation example shows a net weight value that is not consistent with the scale interval of the weighing segment in which it falls, but both 31.1. and 31.2. require that it be consistent. The preamble also states that "Except for semi-automatic tare, all tare values shall not exceed the maximum capacity of the first weighing segment" whereas as 31.1.5. states "Tare may be taken to the maximum capacity of the smallest weighing range (segment) of the scale," leading to another contradiction

- Another issue with Section 31. is the applicability of 31.1. vs 31.2. It seems to be implied that either one or the other applies, depending on how the device operates, but it is not clear. It seems that 31.1. applies to devices that display all three values, while 31.2 is for devices that only display in one mode. However, review of the sub-clauses in each section show that this isn’t correct (e.g. 31.1.9. refers to scales that only show net weight). We feel that section 31 needs to be reviewed to consolidate redundant clauses and clearly state the applicability of 31.1. and 31.2.

The Sector was asked at its 2015 meeting to review NCWM Publication 14, Section 31. for consistency and recommend changes as needed to resolve any conflicts or ambiguous parts. Members of the Sector concluded there are conflicts within Section 31. and it was generally accepted that at least some of the conflicts identified are the result of grouping together the different requirements that apply to the various types of tare, e.g., semi-automatic, keyboard, etc., used with multi-interval scales and scales designed with a single versus dual weight display.

Mr. Harshman (NIST Technical Advisor) noted that the tare requirements contained in the Scales Code of NIST Handbook 44 do not provide the same level of detail as those in the Publication 14 checklist. Members of OWM’s Legal Metrology Devices Program believe more work is needed to further develop requirements that apply to tare taken on multi-interval scales. Mr. Flocken (NCWM) suggested a small work group be formed to further develop the checklist and eliminate the conflicts in Section 31. of Publication 14 DES. Mr. Harshman suggested a review of the requirements in Section 31. to determine their intended application, e.g., those intended to apply to scales equipped with semi-automatic tare versus keyboard tare, etc. He further noted that he believed that much of this work had already been completed by the Sector in previous meetings.

The Sector agreed with Mr. Flocken’s suggestion to form a small work group to further develop the checklist and eliminate the inconsistencies that had been identified. The following members of the Sector volunteered to participate on the work group:

Tom Buck (Ohio)
Scott Davidson (Mettler-Toledo)
Paul Lewis (Rice Lake Weighing)
Pascal Turgeon (Measurement Canada) or (Justin Rae)
Rick Harshman (OWM)

Mr. Harshman agreed to host the first work group tele-conference and it was agreed that the work group would attempt to develop a proposal for the Sector to consider at next year's meeting.

A final recommendation made by Mr. Pascal at the 2015 Sector meeting was to move 31.1.9. and all of its subparts to 31.2. since all of 31.1.9. applies to scales that display or record only net weight values and 31.2. applies to scales that indicate in only one mode (gross or net). This recommendation to be considered by the work group as part of their review and further development of Section 31.

Prior to the 2016 NTEP Lab Meeting, Mr. Harshman developed a draft document titled "Principles of Tare - Multi-Interval and Multiple Range Scales" to be reviewed at the 2016 NTEP Lab Meeting with the NTEP weighing evaluators and those members of the small work group formed by the WS (to further develop the checklist and eliminate inconsistencies) in attendance at the meeting. This draft document was created with the thought that if agreement could be achieved on some basic principles of tare for the different types of tare operation, e.g. keyboard, push-button, etc., it might make it easier to identify in NCWM Publication 14 those requirements that deviate from the agreed upon principles that they could then be eliminated. The draft document was reviewed at the 2016 Lab Meeting, feedback provided, and a revised version of the document was completed.

At the 2016 WS Meeting, members of the Sector were asked to review the revised draft document titled, "Principles of Tare - Multi-Interval and Multiple Range Scales" and provide feedback on whether or not they agreed or disagreed with the different tare principles specified in the document and to identify any remaining gaps that needed to be addressed. The revised draft document was provided as an attachment to the Sector's 2016 agenda and is also included as an attachment to this agenda. Providing the Sector can achieve agreement on basic principles of tare, it was further recommended that members of the Sector review the specific portions of DES Section 13 that MC had previously identified as being in conflict and recommend corrective action as necessary.

The Sector may also want to consider recommending that a final completed version of this draft document be inserted as an Appendix to the DES Section of NCWM Publication 14 for future reference.

During the 2016 WS meeting, Mr. Harshman (NIST Technical Advisor) provided a review of the different portions of NCWM Publication 14 DES Section 31 that had previously been identified by MC as being in conflict with one another. He stated that the tare requirements in HB 44 applicable to single range scales are easy to understand and apply because for most scale types, the value of the tare division must equal the value of the scale division. If an attempt is made to enter a tare to a value that differs from the value of the scale division, the scale must either reject the entry or round the entry to the value of the nearest scale division. Either option is considered acceptable for single range scales and will typically result in a net weight indication that is mathematically correct (i.e., gross – tare = net).

The subtraction of tare from a gross load on a multi-interval and multiple range scale becomes more complicated because tare can be taken in a weighing segment or range that differs from the weighing segment or range of the gross load applied. Consequently, the value of the scale division in the range where tare is taken is often different than the value of the scale division in the range where the gross load happens to fall. NCWM Publication 14 restricts the maximum tare that can be taken to the capacity of the smallest weighing range or segment. Thus, when a tare is taken in the smallest weighing range or segment and the gross load applied is in a higher weighing range or segment, how the scale treats that tare entry to provide an accurate net weight indication (result) is of concern. If the scale has been designed to round the tare to the nearest scale division of the weighing range or segment in which the gross load falls, the tare could round to zero, and some could conceivably argue that by doing so, facilitates the perpetration of fraud. Additionally, a different net weight can result depending on whether the scale rounds the tare before subtracting it from the weight of the gross load or rounds the net weight result after tare has been subtracted from the weight of the gross load. This issue is made even more complex when considering the different types of tare, e.g. semi-automatic, keyboard, digital, etc., and the fact that the determination of net weight might be different depending on the type of tare being operated.

Mr. Harshman noted too that HB 44 contains a provision (Scales Code S.1.2.1.) which exempts multi-interval and multiple range scales from having to present net weight indications in divisions of 1, 2, or 5, (or a decimal multiple or submultiple of 1, 2, or 5) when the net weight indication is calculated from gross and tare weight indications that have different scale division values. Mr. Harshman stated that to his knowledge very few multi-interval and multiple range scales are designed to operate in this fashion (perhaps only a single model from one manufacturer). Mr. Harshman stated that he did not believe Canadian requirements included such a provision. Mr. Turgeon acknowledged agreement.

Mr. Harshman stated that he believed if U.S. scale manufacturers could agree on some basic principles of how tare is to operate on multi-interval and multiple range scales, these principles could quite possibly help resolve the conflicts that had been identified by MC in Publication 14. They might also be used to help establish a means of grouping together the different tare requirements in Publication 14 by tare type, should someone wish to take on this effort, so they are better organized and can be more easily followed. Mr. Harshman then initiated a review of a draft document that he had prepared titled, "Principles of Tare – Multi-Interval and Multiple Range Scales" to try and determine if different U.S. scale manufacturers represented at the meeting were consistent in how they had designed their scales to calculate a net weight indication from a tare taken in a lower weighing range or segment than the weighing range or segment of the gross load. He asked the various members of the Sector, and in particular, those representing a US scale manufacturer, to review the example calculations shown in the draft document and to explain how their scales determined the net weight result. Several of the scale representatives, upon being asked to provide input, indicated that they were not familiar with how their scales determined net weight and would need to consult with engineering staff and report back sometime later. Consequently, it was agreed this item could not be concluded during the meeting because it required additional input from the U.S. scale manufacturers. As a result, the Sector agreed this item would remain on its agenda in 2017 as a carryover item.

In concluding the discussions on this item, Mr. Harshman indicated that although he wished to remain an active member of the tare work group, he preferred not to lead it in 2017 due to a current staffing shortage within the Legal Metrology Devices Program of OWM and there being no indication of when that situation might improve. Mr. Darrell Flocken (NTEP Specialist) offered to assume lead of the work group and the Sector accepted his offer. All 2016 members of the tare work group agreed to continue participation on the work group. Mr. Robert Meadows (KS) and Mr. Eric Golden (Cardinal Scale Manufacturing, LLC) volunteered and were added as new participants on the work group.

Recommendation:
Mr. Flocken to provide an update to the Sector on the progress of the tare work group since the last WS meeting.

Discussion/Conclusion
Mr. Flocken reported that although his available time to work on this issue was very limited since the Sector's last meeting, he was able to contact a few U.S. scale manufacturers to discuss with them the operational characteristics of tare taken on single range, multiple range, and multi-interval scales. This contact was made to try and determine if US scale manufacturers are consistent in how tare is designed to operate for the different kinds of tare offered (e.g., semi-automatic, manually-entered, etc.) on scales manufactured by US companies. Mr. Flocken stated that he does not believe, based on those discussions, that US scale manufacturers are consistent in how they've designed tare to operate for the different kinds of tare and particularly as an operational feature on multi-interval and multiple range scales. He further stated that he didn't believe scale manufacturers necessarily needed to agree at the present time on the specifics of how tare should operate to be able to resolve the conflicts identified by MC and noted in the background/discussion portion of this agenda item.

Mr. Flocken then offered, in an effort to take advantage of the time made available due to a small number of items on the Sector's agenda, to lead a discussion on tare following completion of all remaining agenda items. Mr. Harshman (NIST OWM) shared a concern that he had raised earlier during the meeting with the NTEP labs. He stated any agreement on principles of how tare is to function on multi-interval and multiple range scales needed, in his opinion, to take into consideration the weights and measures model law. The model law prohibits a person, by himself, or by his servant or agent, to sell, offer, or expose for sale less than the amount represented of any commodity or object. In the case of a multi-interval or multiple range scale having to change a tare entered in a lower weighing range or segment in which the net weight happens to fall, if by changing the tare value (e.g., the scale rounds the tare down because the net result is in a higher weighing range) it causes customers to receive less product than the amount represented, might the scale manufacturer be held responsible? Mr. Flocken and others agreed the concern needed to be part of the discussion on tare for multi-interval and multiple ranges scales.

Most members of the Sector were present during the tare discussion led by Mr. Flocken, which occurred the next morning. Mr. Flocken opened the discussion by suggesting the Sector consider splitting the item into two separate and distinct parts and trying first to resolve the more immediate concern of the two; that being, the existence of conflicts in NCWM Publication 14 DES associated with the taking of tare on multi-interval scales. The other part, which would likely take longer to resolve and could be worked on as time permits and at a less accelerated pace, is for the weights and measures community to agree on some basic principles of how different types of tare are to function on multi-interval and multiple ranges scales. Once basic principles of tare have been established, the Sector could then propose additional changes, as needed, to NIST HB 44 and NCWM Publication 14 DES. Members of the Sector agreed to the approach suggested my Mr. Flocken.

Mr. Flocken shared his understanding of how single range scales, multiple range scales, and multi-interval scales typically function when different kinds of tare is taken. The following are some significant points made by Mr. Flocken relating to the conflicts identified by MC:

- There is an exception in HB 44 to requiring the value of a scale division to be expressed as 1, 2, or 5, (or a decimal multiple or submultiple of 1, 2, or 5) for net weight indications and recorded representations calculated from the gross and tare weight indications when the scale division of the gross weight is different from the scale division of the tare weight(s) on multi-interval or multiple range scales. For example, a tare may be taken in a lower weighing segment or range and then subtracted from the gross indication in a higher weighing segment or range and the net weight result be mathematically correct and expressed to a value other than 1, 2, or 5 (or a decimal multiple or submultiple of 1, 2, or 5). This exception appears in Scales Code paragraph S.1.2.1. Digital Indicating Scales, Units. MC requirements provide no such exception; so, in this regard, MC requirements are different than U.S.

- A rounding problem occurs on a multiple range scale having three ranges when the scale division values of the three ranges are 1 lb, 2 lb, and 5 lb, when the scale user enters a 1 lb tare and the applied load is in the 5 lb range. The problem created from this scenario is that the scale will zero the tare, which isn't permitted.

- Hand-entered tare cannot be taken above the capacity of weighing segment one on a multi-interval scale, however, semi-automatic tare (i.e., push-button tare) can be taken in any weighing segment.

Once Mr. Flocken had finished sharing this information, he stated that he didn't expect everyone in the room to agree with every example that he had provided. He also said that he recognized different scale manufacturers may have designed tare to operate somewhat differently than he had described, especially with respect to multi-interval scales.

Mr. Flocken then requested Mr. Turgeon identify the different conflicting sections of Publication 14 DES. He also asked members of the Sector to consider possible solutions to those conflicts as Mr. Turgeon identified and described each one. The following three conflicts were identified and possible solutions discussed:

1. The preamble to Section 31. contains examples and clauses that conflict with the requirements set out in 31.1. and 31.2. For example, the tare calculation example shows a net weight value that is not consistent with the scale interval of the weighing segment in which it falls, but both 31.1. and 31.2. require that it be consistent.

Possible Solution: Identify within 31.1 and 31.2 an appropriate location to add a sentence, similar to the following, appearing in HB 44 Scales Code paragraph S.1.2.1:

> *The requirement that the value of the scale division be expressed only as 1, 2, or 5, or a decimal multiple or submultiple of only 1, 2, or 5 does not apply to net weight indications and recorded representations that are calculated from gross and tare weight indications where the scale division of the gross weight is different from the scale division of the tare weight(s) on multi-interval or multiple range scales.*

2. The preamble to Section 31. also states that "Except for semi-automatic tare, all tare values shall not exceed the maximum capacity of the first weighing segment (WS1)" whereas 31.1.5. states "Tare may be taken to the maximum capacity of the smallest weighing range (segment) of the scale," leading to another contradiction.

   Possible Solution: Consider adding the words, "Except for semi-automatic tare" as a lead in to the sentence in 31.1.5.

3. Another issue with Section 31. is the applicability of 31.1. versus 31.2. It seems to be implied that either one or the other applies, depending on how the device operates, but it is not clear. It seems that 31.1. applies to devices that display all three values, while 31.2 is for devices that only display in one mode. However, review of the sub-clauses in each section show that this isn't correct (e.g. 31.1.9. refers to scales that only show net weight). We feel that section 31 needs to be reviewed to consolidate redundant clauses and clearly state the applicability of 31.1. and 31.2.

   Discussion/Possible solution: It is believed that Section 31.1., at the time when first added to Publication 14 was intended to apply to scales equipped with a separate display for gross-, tare-, and net- weight indications and that 31.2. was intended to apply to single display scales. Most computing scales are equipped with only a single display and because 31.1.9. identifies "most computing scales" as the example of a scale that displays or records only net weight values, it is believed that 31.1.9. and all of its subparts, should be part of Section 31.2. rather than Section 31.1. Consequently, the agreed upon solution for this conflict is to move 31.1.9. and all its subparts to Section 31.2.

   There was general agreement amongst Sector members that the possible solutions discussed for each of the conflicts identified by MC seemed appropriate. Mr. Flocken, acknowledging the fact that members seemed to agree on the solutions to these issues, suggested that a new proposal to amend the pertinent sections of Publication 14 be drafted and presented for consideration at next year's Sector meeting. Members of the Sector agreed with his suggestion and Mr. Turgeon offered, at Mr. Flocken's request, to draft a proposal that would address each of the conflicts.

This item will appear as a carryover item on the Sector's 2018 agenda.

NEW ITEMS

3. NCWM Publication 14 DES - Minimum Platform Area (Section Lengths) Parameter Sections 8.1., 8.2., and 8.3.

Source:
J. Eric Golden (Cardinal Scale Manufacturing Company)

Background:
At the 2009 Weighing Sector meeting, Mr. Ed Luthy (Brechbuhler Scales) submitted an item for consideration that would affect NCWM Publication 14 DES Sections 8.1, 8.2, and 8.3. The Sector agreed to the proposal, though only Section 8.1 was changed. The submitter believes it was an accidental omission to not also update Sections 8.2 and 8.3 and is recommending these sections be amended since they too, were part of the proposal. He is also recommending that the changes be retroactive back to 2009; the date in which the proposal was originally considered by the WS.

The submitter is recommending the following changes:

Proposed changes to Section 8.2:

8.2. Additional criteria for vehicle scales, railway track scales, combination vehicle/railway track scales, and other platform scales greater than 200 000 lb.

A CC Will Apply to All Models Having:

a. **Nominal capacities** no greater than the evaluated capacity.

~~**b. A platform area for any two section portion no less than 50% of smallest two section portion incorporated in the device evaluated.**~~

b.~~c~~ Widths up to 120% of the width of the platform tested that of the device tested.[3]

c.~~d~~ Lengths **no shorter than 7' and up** to 100% of the length of the platform tested (for railway track and railway track portion of combination scales length to 150% of device evaluated.)

d.~~e~~ Spans between sections of not more than 20% greater than the equipment evaluated (for vehicle scale no greater than the device evaluated.)

Notes For ***d*** ~~*e*~~*:*

- On a combination Vehicle/Railway Track Scale, a test of the CLC for the vehicle portion of the scale is not required provided the scale has been evaluated as a Railway Track Scale.
- The device must be evaluated using the smallest emin value that will be listed on the certificate. This may require the use of a multiple range weight indicator for combination vehicle/railway track scales.
- The CLC for the vehicle scale portion of the device must not exceed the maximum test weight used for the section test of the railway track scale. The CLC listed on the CC shall be no greater than what would be permitted in Section 8.d.)

---

[3] *For scales with widths greater than 12 feet, this policy on range of widths may not be applied retroactively unless the criteria in DES 67 or 68 have been performed. Test procedures for scales wider than 12 feet will be addressed by NTEP management and the NTEP laboratories on a case-by-case basis.*

Proposed changes to Section 8.3:

8.3. Modular Load-Cell Vehicle, Livestock, or Railroad Track Scales

Note: These criteria apply if the scale is …

Modular Scale

A vehicle, livestock or railroad track scale made up of individual …

8.3.1. Modular Scale to be Tested

The following criteria must be satisfied …

8.3.2. Range of Parameters for Modular Scales

The following range of parameters will be used to establish the sizes and capacities of modular load cell vehicle, livestock, or railway track scales that will be covered on a CC based upon the test of a single scale.

a. Nominal capacities not more than 1.5 times CLC for a two-section scale to 135% of capacity of the device evaluated. The nominal capacity for the railroad track scale in a modular vehicle/railroad combination will be no greater than the capacity of the device submitted for evaluation.

b. ~~**Platform area not less than 50% of smallest two-section (four-cell) module incorporated in the device evaluated.**~~ **<u>Platform lengths no shorter than 7'.</u>** Increased lengths for scales with two or more modules are not restricted as long as the width complies with 8.3.2. (e) and the load cells meet the vmin formula (e.g., vmin ≤ d / √ N where "N" is the number of load cells in a single independent weighing/load receiving element. Independent means with a weighing/load receiving element not attached to adjacent elements and with its own A/D circuitry and displayed weight.) Additional modules to increase length must be of the same type as those used in the device submitted for evaluation (e.g., 4-cell, 2-cell, and 0-cell.)

c. **…**

Recommendation: Review the contents of Agenda Item 11. in the Sector's 2009 Meeting Summary to determine if the submitter's recommended changes to Sections 8.2. and 8.3. are appropriate. The entire contents of Agenda Item 11. from the 2009 WS Meeting Summary have been copied and inserted as an attachment to this item in Appendix A.

Note from NIST Technical Advisor: *Although the title of Agenda Item 11 from the 2009 WS Agenda references Sections 8.1., 8.2., and 8.3, it does not appear that the Sector considered or discussed changing Sections 8.2. or 8.3. during the meeting. The only changes made note of in the Sector's Summary Report and the NIST Technical Advisor's DRAFT Brief Summary and Action Items Report are to Section 8.1. Additionally, the Background information for Agenda Item 11. provides only the submitter's recommendation to amend Section 8.1.*

Discussion/Recommendation: Mr. Harshman provided an overview of the background information pertaining to this item to members of the Sector, which included a description of the problem identified by the submitter. Mr. Harshman noted, that, based on his review of the 2009 WS Summary Report and an additional report completed by Mr. Steve Cook (NIST Technical Advisor to the WS in 2009) on action items from that meeting, it didn't appear the Sector ever considered changes to Sections 8.2 or 8.3. during the 2009 WS meeting. Mr. Harshman requested that members of the Sector direct their attention to the three documents he had copied and inserted as attachments to this item in Appendix A of the agenda to see if they too shared his perspective on whether or not the WS, in 2009, had considered changes to these Sections.

Mr. Golden stated that when first drafting the proposal he thought that the reason Sections 8.2. and 8.3. weren't changed following the 2009 WS meeting was simply an oversight. He now believes, having completed a review of the documents referenced by Mr. Harshman, it is likely that the WS never considered the changes proposed to Sections 8.2. and 8.3. He then questioned the rationale of making changes to Section 8.1. without also making corresponding changes to Sections 8.2 and 8.3. and asked if it were possible for the Sector to consider these changes now. Members of the Sector agreed to discuss and consider the changes.

A representative of one of the U.S. scale manufacturers questioned why NTEP's policy corresponding to length of platform for railroad track scales is 150 percent of device evaluated and for truck scales the policy is only 100 percent of the length evaluated. Mr. Flocken stated that the reason for this difference is due to: 1) the existence of more stringent installation requirements for railroad scales which are specified in the Association of American Railroads (AAR) Scale Handbook, and 2) this section of the NTEP Technical Policy deals with non-modular vehicle scales.

Mr. Golden, upon being made aware of the Sector's decision to consider the proposed changes, stated that he understands why NTEP would need to restrict *maximum* platform length and width, but he doesn't understand why NTEP would need to provide a restriction on the *minimum* platform area; area being comprised of length and width. He asked if anyone knew the reason for the platform area restriction. Mr. Flocken reported that it was his understanding that that there was no technical basis for NTEP's decision to add the *minimum* platform area restriction into its policy and at the time of drafting of the policy, 50 percent of the smallest two-section portion incorporated in the device evaluated seemed reasonable.

Mr. Rob Upright (WS Chairman) then asked members of the Sector if there were any concerns regarding the changes being proposed by Mr. Golden. There were no concerns raised and members of the Sector then agreed to recommend NCWM Publication 14 be amended as proposed by Mr. Golden. Mr. Flocken asked members if they thought it necessary to specify a minimum platform width considering the Sector's decision to recommend that the restriction on minimum platform area be deleted. There was very little discussion on the question and no one spoke in support of including a minimum platform width. Consequently, it was decided not to include such a specification.

Members of the Sector, in addition to agreeing to recommend NCWM Publication 14 be amended as proposed by Mr. Golden, also agreed that the recommended changes should be backdated to apply to equipment submitted for type evaluation from January 1, 2010 forward. Mr. Flocken commented that NTEP has no issue with the proposed change to specify platform lengths no shorter than seven feet or making the changes retroactive as of 2010. A new NTEP application will need to be submitted in order to amend the NTEP CC on any weighing/load-receiving elements affected by these changes.

4. Identification of Certified Software - NCWM Publication 14 DES Section 3. Additional Marking Requirements- Not Built-for-Purpose Software-Based Devices

Source:
NTEP Software Sector (2017)

Background:
At the 2017 NTEP Software Sector Meeting, members of the Software Sector agreed that the second paragraph of the Note shown in NCWM Publication 14 DES Section 3. Additional Marking Requirements-Not Built-for-Purpose Software-Based Devices be part of the checklist applicable to software that is submitted for NTEP certification rather than part of a Note, as is the case now. The following reflects the current text in Section 3.:

3. Additional Marking Requirements- Not Built-for-Purpose Software-Based Devices

Identification of Certified Software:

Note: Manufacturers may choose to separate metrologically significant software from non-metrologically significant software. Separation would allow the revision of the non-metrological portion without the need for further evaluation. In addition, non-metrologically significant software may be updated on devices without breaking a seal, if so designed. Separation of software requires that all software modules (programs, subroutines, objects, etc.) that perform metrologically significant functions or that contain metrologically significant data domains form the metrologically significant software part of a measuring instrument (device or sub-assembly). If the separation of the software is not possible or needed, then the software is metrologically significant as a whole.

The manufacturer must describe and possibly demonstrate how the version or revision identifier is directly and inseparably linked to the metrologically significant software. Where the version revision identifier is comprised of more than one part, the manufacturer shall describe which portion represents the metrological significant software and which does not.

The following reflects the changes proposed by the SS:

X. Additional Marking Requirements- Not Built-for-Purpose Software-Based Devices

Identification of Certified Software:

X.X. The manufacturer must describe and possibly demonstrate how the version or revision identifier is directly and inseparably linked to the metrologically significant software. Where the version revision identifier is	☐ Yes ☐ No ☐ N/A

comprised of more than one part, the manufacturer shall describe which portion represents the metrological significant software and which does not.

Note: Manufacturers may choose to separate metrologically significant software from non-metrologically significant software. Separation would allow the revision of the non-metrological portion without the need for further evaluation. In addition, non-metrologically significant software may be updated on devices without breaking a seal, if so designed. Separation of software requires that all software modules (programs, subroutines, objects, etc.) that perform metrologically significant functions or that contain metrologically significant data domains form the metrologically significant software part of a measuring instrument (device or sub-assembly). If the separation of the software is not possible or needed, then the software is metrologically significant as a whole.

Recommendation:
Members of the Sector are requested to consider the changes suggested by the SS and determine if they are appropriate. This proposal was also submitted to the Grain Analyzer Sector and the Measuring Sector for consideration at their 2017 meetings and if approved, all of text in the proposal will be added to respective portions of NCWM Publication 14**.**

Conclusion: There were no objections to the SS's suggested changes and members of the WS agreed to recommend Publication 14 be amended as proposed.

ATTACHMENTS

Attachment to Agenda Item 2. Principles of Tare – Multi-Interval and Multiple Range Scales

Principles of Tare – Multi-Interval and Multiple Range Scales

Multi-Interval Scales

Digital, Keyboard, and Programmable Tare

- It shall not be possible to enter or program a tare value that exceeds the capacity of WS1
- All tare values shall be equal to the value of the displayed scale division of WS1
    - If an attempt is made to enter a tare to a different value of d of WS1, the scale shall either reject the tare entry or round the tare entry to the nearest value of d of WS1
- Which of the following two bullet points in the box below is a correct statement (i.e. principle of tare) or should it be specified that either "rounding" method is appropriate?

1. A tare entered (or programmed) to the value of the displayed scale division of WS1 will automatically round to the closest value of the displayed scale division of the WS in which the net weight happens to fall once a gross load has been applied; *or*

2. A tare entered (or programmed) to the value of the displayed scale division of WS1 will be subtracted from the weight of a gross load and the net result then rounded to the closest value of the displayed scale division of the WS in which the net result happens to fall.

The example below provides indication of the difference in the net weight results depending on which value (tare or net) gets rounded.

Consider the following capacity statements marked on a multi-interval scale for this example:

WS1 0–1000 lb x 2 lb
WS2 1000 – 5000 lb x 5 lb

Displayed and/or Printed		
	Actual	Acceptable
Gross	1010 lb	1010 lb
Tare	− 12 lb	− 12 lb
Net	998 lb	1000 lb

In this example, if the scale rounds tare to the closest value of the displayed division in the range of the resulting net weight, it would round the 12 lb tare to 10 lb and the net result would be 1 000 lb. However, if it is the net weight that gets rounded after subtraction of tare, the net weight would round to the closest 2 lb and the result would be 998 lb.

The decision is important becasuse if it decided that rounding is to the net weight (i.e., after subtraction of tare) then there is only one correct answer and that is 998 lb. If rounding of tare is permitted, then both net results would be considered correct (that is, 998 would still be considered acceptable due to the exception allowed by Scales Code paragraph S.1.2.1.)

NCWM Pub 14 DES Section 31. currently specifies the following:

In applying these principles, it is acceptable to:

- **Round the indicated and printed tare values to the nearest appropriate net weight scale division.**

In reviewing this example during the 2016 NTEP Lab meeting, Mr. Flocken indicated that the net result could be either 998 lb or 1 000 lb. For the net result to be 1 000 lb, the 12 lb tare must round to the nearest value of d in the second weighing range (10 lb). That is, rounding would have to occur before subtraction of tare from gross. If rounding occurred after subtraction, then the only acceptable answer would be 998 lb. A 2 lb rounding error is significant because it represents approximately 0.2 % of the net load. Review answers again with Darrell just to confirm he believes both answers are correct.

Which is correct? What is the rule or principle that applies?

- The value of the scale division for the net weight, whether positive or negative, must be displayed in scale divisions consistent with the weighing segment in which the net weight falls.

- If a tare value can be cleared when a load is on the platform, a clear indication that the tare value has been eliminated must be provided.

- In all cases, any displayed or recorded net weight value must be in mathematical agreement with the gross and tare values indicated or recorded (i.e., gross - tare = net).

    - This applies to both when a tare value and the resulting net weight value fall in the same WS (i.e., WS1) and when a tare value and the resulting net weight value fall in different WSs (e.g., tare in WS1 and the resulting net weight in WS2)

- A multi-interval scale may indicate and record tare weights in a lower weighing segment (WS) and net weights in a higher WS and provide a mathematically correct net weight result in accordance with the examples provided in HB 44 Scales Code paragraph S.1.2.1. Digital Indicating Scales, Units.

The following examples are provided to better show how these principles apply:

Consider the following capacity statements marked on a multi-interval scale for Examples A-D shown in the table below:

WS1	0 – 5 lb x 0.002 lb
WS2	5 – 10 lb x 0.005 lb
WS3	10 – 30 lb x 0.01 lb

Example A
Displayed and/or Printed

	Actual	Acceptable
Gross	13.38 lb	13.38 lb
Tare	− 0.122 lb	− 0.122 lb
Net	13.258 lb	13.26 lb

In the "Acceptable" column 13.258 lb has been rounded up to the nearest scale division of WS3.

Example B
Displayed and/or Printed

	Actual	Acceptable
Gross	13.38 lb	13.38 lb
Tare	−0.004 lb	−0.004 lb
Net	13.376 lb	13.38 lb

In the "Acceptable" column 13.376 has been rounded up to the nearest scale division of WS3. *In this case, the scale clears the tare value once the load is applied. The scale is required to provide a clear indication of that it has done so.*

Example C
Displayed and/or Printed

	Actual	Acceptable
Gross	13.38 lb	13.38 lb
Tare	−0.006 lb	− 0.006 lb
Net	13.374 lb	13.37 lb

In the "Acceptable" column 13.374 has been rounded to the nearest scale division of WS3.

Example D
Displayed and/or Printed

	Actual	Acceptable
Gross	10.54 lb	10.54 lb
Tare	− 0.626 lb	− 0.626 lb
Net	9.914 lb	9.915 lb

In the "Acceptable" column 9.914 has been rounded to the nearest scale division of WS2.

In each of the examples shown above, the net values shown beneath both "Actual" and "Acceptable" would be considered the only acceptable results given the principles of tare on a multi-interval scale.

Push-button (Semi-automatic) Tare

- There are no capacity limitations for semi-automatic tare. Tare may be taken to the capacity of any WS.
- A semi-automatic tare rounds the weight of the object being tared to the closest value in the range where taken.
- Entries of tare shall be to the value of the displayed scale division of the WS in which the tare is taken and then rounded to the closest value of the displayed scale division in the WS in which the net weight results once a load is applied.
- In all cases, any displayed or recorded net weight value must be in mathematical agreement with the gross and tare values indicated or recorded (i.e., gross - tare = net).

- The value of the scale division for the net weight, whether positive or negative, must be displayed in scale divisions consistent with the weighing segment in which the net weight falls.

Multiple Range Scales

- It is important to think of each weighing range of a multiple range scale as if a single scale. There are multiple range scales in which the range is manually selected and there are those in which the range changes automatically with the amount of load applied.
  - For those in which the range is manually selected, tare can only be taken to the value of the displayed scale division of the range selected. An attempt to enter a keyboard (or programmable) tare value that differs from the value of the displayed scale division can either be rejected or rounded and accepted to the closest value of the displayed scale division.
  - For those in which the range changes automatically, the scale must only accept a tare entry to the displayed scale division of the range in which the tare value falls. A tare entry accepted in a lower WR will automatically round to the nearest displayed scale division of a higher weighing range once the application of a load causes the net weight indication to breach the higher WR. However, if the applied load is then decreased, the value of the tare scale division (that was previously rounded to the higher WR) must not change, nor shall the value of the displayed net weight scale division change to that of the lower WR.
  - If a tare value can be cleared when a load is on the platform, a clear indication that the tare value has been eliminated must be provided (*What constitutes a clear indication that tare has been removed?*

Both Multi-Interval and multiple range scales

- The tare mechanism shall only operate in a backward direction with respect to the zero-load balance condition of the scale.
- Scales must provide a clear indication that tare has been taken.
- If tare is set to zero, there must be a clear indication that tare has been removed.
- If a tare value can be cleared when a load is on the platform, a clear indication that the tare value has been eliminated must be provided. What is not known is how the scale will identify the quantity being displayed once tare is erased. I believe some scales revert back to a gross. What constitutes a clear indication that tare has been removed? Under what conditions would NTEP accept the deletion of a tare entry?
- Scales designed to automatically clear tare, shall be designed to prevent the clearing of tare until a complete transaction has been indicated.
- A pre-programmed tare cannot replace a manually entered tare without obvious indication.
- The tare weight plus the net weight must always equal the gross weight. In all cases, any displayed or recorded net weight value must be in mathematical agreement with the gross and tare values indicated or recorded (i.e., gross - tare = net).
- Keyboard and programmable tare entries must be visible at some point in the transaction so the entry can be verified. (Re: DES Section 48). Do you agree that this principle also applies to multi-interval and multiple range scales?

Attachments to Agenda Item 3 Minimum Platform Area.

- **Pdf copy of the 2009 proposal submitted by Mr. Luthy (Brechbuhler Scales)**

National Conference on Weights and Measures / National Type Evaluation Program

Request for Agenda Items

Weighing Sector Meeting / August 25-27, 2009 / Columbus, Ohio

If completing **Request for Agenda Items for the Weighing Sector Meeting by hand**, do so legibly and in blue ink. Illegible forms may delay processing times. **Submit by July 24, 2009** in one of the following ways:
Mail: 1135 M Street, Suite 110 / Lincoln, NE 68508 **P.** 402.434.4880 **F.** 402.434.4878 **E-Form.** Sent Via Your Email

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Date:	Member ID #:	Full Name:
7-24-09	25313	L. EDWARD LUTHY

Organization / Jurisdiction:	Title:
BRECHBUHLER SCALES INC	V.P. - HIGH CAPACITY

Phone Number:	Fax Number:	Email Address:
330-453-2424	330-471-8909	ELUTHY@BSCALES.COM

PLEASE ATTACH ADDITIONAL PAGES AND INFORMATION AS NEEDED

PROBLEM/JUSTIFICATION (Include a concise statement of the issue/problem outlining the purpose and need for its consideration.)

WHAT IS THE JUSTIFICATION FOR HAVING A MINIMUM SPAN LENGTH? MAX. SPAN OKAY AS IS.

PROPOSAL (Proposed solutions to problems stated in specific language in amendment form to Publication 14, test methods and/or test method interpretations.)

REMOVE THIS FROM REQUIREMENTS AND ALLOW ANY MIN. SPAN.

ALTERNATIVE CONSIDERED

ATTACHMENTS (List the accompanying documents, data, studies, etc.)

Reset Submit

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June 2009
Weighing Sector Meeting Request for Agenda Items

- **Excerpt from the 2009 Weighing Sector Meeting Summary**

11. PUB 14 - MINIMUM PLATFORM AREA (SECTION LENGTHS) PARAMETER SECTIONS 8.1., 8.2., AND 8.3.

Source*:* Mr. Ed Luthey, Brechbuhler Scales

Background: Brechbuler Scales is questioning why the minimum platform area on a vehicle scale is limited to 50 % of the device that was tested. For example, a 70' x 10', 3-section vehicle scale was evaluated and passes type evaluation. The CC would then list the minimum platform size as 350 ft^2 or list the minimum L x W scales that would comply with the Pub 14 criteria. Under the Pub 14 language, the applicant would have to submit a smaller second scale if they wanted 10' x 10', 2-section scale listed on the CC.

The submitter of the item believes that there is no technical justification for the limitation. Brechbuhler Scales submitted a proposal to eliminate the 50 % minimum platform area restriction as shown in the recommendation below:

8.1. Additional criteria for vehicle scales, railway track scales, combination vehicle/railway track scales, and other platform scales over 30 000 lb and up to and including 200 000 lb.

A CC will apply to all models having:

a. **nominal capacities** up to 135 % of evaluated capacity;

~~**b. a platform area for any two section portion no less than 50 percent of smallest two section portion incorporated in the device evaluated.**~~

c. **widths** up to 120 % of the width of the platform tested;

d. **lengths** 150 % of the length of the platform tested;

e. a **span** between sections is not more than 20 % greater than the equipment evaluated;

Discussion: Mr. Steve Cook (NIST Technical Advisor) reported on past Publication 14 language and WS discussions on this item. Mr. Cook noted that the above referenced language has been in Publication 14 since its earliest publication. Additionally, he found references to the current language as far back as 1983 in the notes of the National Type Approval work group. The National Type Evaluation work group included NIST, Weights and Measures Officials, scale manufacturers, and load cell manufactures. Mr. Cook contacted some of the work group participants (Mr. Richard Suiter and Mr. Henry Oppermann) to inquire if they recall the justification for the accepted language and report any additional information during the WS meeting. They recalled that it was agreed that a lower limit was needed and that the selections of the 50 % lower limit was not based on any technical justifications. Mr. Truex was concerned that completely eliminating the lower limit for platform area may result in variations in sizes that may be used in unsuitable applications (e.g., a small Class III L vehicle scale used in a Class III platform scale application.). The WS agreed with Mr. Langford's suggestion of seven-foot minimum length.

Conclusion: The Sector agreed to amend the criteria in DES Technical Policy 8.1.b and c by deleting 8.1.b. and adding "lengths no shorter than 7" . . ." to 8.1.c. since the platform area is deleted. This recommendation can be found in Appendix A - Agenda Item 11.

Appendix A: Agenda Item 11.

8.1. Additional criteria for vehicle scales, railway track scales, combination vehicle/railway track scales, and other platform scales over 30 000 lb and up to and including 200 000 lb.

A CC will apply to all models having:

a. **nominal capacities** up to 135 % of evaluated capacity;

~~**b. a platform area for any two section portion no less than 50 percent of smallest two section portion incorporated in the device evaluated**~~.

b~~c~~. **widths** up to 120 % of the width of the platform tested**;**

c~~d~~. **lengths no shorter than 7' and up to** 150 % of the length of the platform tested**;**

d~~e~~. a **span** between sections is not more than 20 % greater than the equipment evaluated;

- **Excerpt from the 2009 WS Meeting Report of DRAFT Brief Summary and Actions Items as reported by Steve Cook (NIST Technical Advisor, retired)**

National Type Evaluation Technical Committee
Weighing Sector
August 25 – 27 2009, Columbus Ohio
DRAFT Brief Summary and Action Items

Item	Subject	Conclusion/Action[1]	Who	Date
1	Load Cell Creep Recovery	Sector supports proposed changes to Pub 14.	Cook	11-09
		Sector supports proposed editorial changes (as amended) to Pub 14.	Cook	11-09
...	…	…	…	…
11.	Pub. 14 - Minimum Platform Area (Section Lengths) Parameter Sections 8.1., 8.2., and 8.3.	The Sector agreed to amend the criteria in DES Technical Policy 8.1.b and c by deleting 8.1.b. and adding "no shorter than 7' to c.	Cook	11-09
…	…	…	…	…

[1]Recommended changes to Publication 14 will be submitted by the NIST Technical Advisor to the NTEP Administrator for review and distribution to the NTEP Committee prior to the 2010 NCWM Interim Meeting.

ATTENDEE LIST 2017 MEETING

Tom Buck
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Nominating Committee
2018 Interim Meeting Report

Ms. Kristin Macey, Committee Chair
California

INTRODUCTION

The Nominating Committee (hereinafter referred to as the "committee") submits its Interim Report for consideration by National Conference on Weights and Measures (NCWM). This report contains the slate of nominees as officers of the corporation.

Table A identifies the agenda items by reference key, title of item, page number and the appendices by appendix designations.

Table A
Table of Contents

Table B
Voting Results

Reference Key Number	*House of State Representatives*		*House of Delegates*		*Results*
	Yeas	*Nays*	*Yeas*	*Nays*	
To Elect the Slate of Officers as presented in the Report	Voice Vote				Adopted

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Details of All Items
(In order by Reference Key)

NOM – NOMINATIONS

NOM-1 V Officer Nominations

Source:
Nominating Committee

Purpose:
Election of NCWM officers

Item Under Consideration:
The following slate of officers was selected by unanimous vote of the Committee:

Chairman-Elect:
Craig VanBuren, Michigan Department of Agriculture

Board of Directors Active Director - Southern: (5 years)
Hal Prince, Florida Department of Agriculture and Consumer Services

Board of Directors Active Director - Central: (2 years to complete the term vacated by Craig VanBuren)
Ivan Hankins, IA Department of Agriculture

Board of Directors At-Large Director: (5 years)
Rebecca Richardson, MARC IV Consulting

Background / Discussion:
The Nominating Committee met during the 2018 Interim Meeting at the Sirata Beach Hotel and Resort in St. Pete Beach, Florida at which time the Committee nominated the persons listed above to be officers of the 104th National Conference on Weights and Measures. In the selection of nominees from the active and associate membership, consideration was given to professional experience, qualifications of individuals, conference attendance and participation, and other factors considered to be important.

Ms. Kristin Macey, California | Committee Chair
Mr. Stephen Benjamin, North Carolina | Member
Mr. Mark Coyne, City of Brockton, Massachusetts | Member
Mr. Frank Greene, Connecticut | Member
Mr. Ivan Hankins, Iowa | Member
Mr. Richard Lewis, Georgia | Member
Mr. Hal Prince, Florida | Member

Nominating Committee

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