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United States
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REPORT OF THE 82ND NATIONAL CONFERENCE ON WEIGHTS AND MEASURES

as adopted by the 82nd
National Conference on
Weights and Measures 1997

NIST Special Publication 920

1997

Report of the 82nd National Conference on Weights and Measures

Sponsored by the National Institute of Standards and Technology (NIST)

Attended by Officials from the Various States, Counties, and Cities, and Representatives from U.S. Government, Industry, and Consumer Organizations

Chicago, Illinois - July 20-24, 1997

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NIST Special Publication 920

November 1997

Abstract

The 82nd Annual Meeting of the National Conference on Weights and Measures (NCWM) was held July 20 through 24, 1997, at the Swissôtel in Chicago, Illinois. The theme of the meeting was "Fostering International Harmony in Legal Metrology."

Reports by the standing and annual committees of the Conference constitute the major portion of the publication, along with the addresses delivered by Conference officials and other authorities from government and industry.

Special meetings included those of the Metrology Subcommittee, the Associate Membership Committee, the Meter Manufacturers Association, the Gasoline Pump Manufacturers Association, the National Industrial Scale Association, and the National Association of State Departments of Agriculture Weights and Measures Division.

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

Library of Congress Catalog Card Number 26-27766.

Note: The policy of the National Institute of Standards and Technology is to use metric units of measurement in all of 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 inch-pound units. 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.

Nat. Inst. Stand. Technol. Spec. Publ. 920, 350 Pages (Nov. 1997)
CODEN: NSPUE2

U.S. GOVERNMENT PRINTING OFFICE
WASHINGTON: 1997

For sale by the Superintendent of Documents, U.S. Government Printing Office,
Washington, DC 20402-9325

Contents

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44th	1959	C. M. Fuller, CA
45th	1960	H. E. Crawford, FL
46th	1961	R. E. Meek, IN
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54th	1969	S. H. Christie, NJ
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58th	1973	George L. Johnson, KY
59th	1974	John H. Lewis, WA
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61st	1976	Richard L. Thompson, MD
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63rd	1978	James F. Lyles, VA
64th	1979	Kendrick J. Simila, OR
65th	1980	Charles H. Vincent, TX
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*(Grain Moisture Meter Sector only)

Special Address

"Measurement Canada - 1997 and Beyond"
Presented by Alan E. Johnston, President, Measurement Canada

[Mr. Johnston addressed the NCWM at the General Session on Tuesday, July 22, 1997. The text of the slides he used during his presentation is provided below.]

SLIDE 1:

Presentation to NCWM January 1997

Highlights included:

1. Integration of Weights and Measures and Electricity and Gas activities
2. Special Operating Agency Status
3. Mission, Vision, and Values
4. Strategic Direction

SLIDE 2:

Where is Measurement Canada Today?

- Focusing on innovation and improved service delivery
  Focusing limited resources on areas where there is the greatest return to Canadians
- Using the Mission, Vision and Values as the foundation for decision-making at the Agency
- Implementing the Strategic Direction through leadership teams

SLIDE 3:

The General Themes of Measurement Canada's Strategic Direction Are...

- Identification of the core services Measurement Canada will provide directly (establishing rules, monitoring the marketplace, taking action where necessary, and resolving complaints)
- Increased client service and marketplace presence through alternative service delivery and private sector partnerships
- Innovative, client-oriented, and business-like program delivery with an increased emphasis on service, quality and accountability for results
- Increased marketing/communication of Measurement Canada's contribution to a fair, efficient and competitive marketplace
- Development of a knowledgeable and professional workforce capable of assuming new roles critical to the success of Measurement Canada

SLIDE 4:

Strategies for Success - Business Scope

Develop a marketplace intervention model for trade measurement to address the following issues:

- is intervention required in a particular trade sector, i.e., water metering?
- is intervention required in the trade sector beyond that currently provided?
- what is the level of intervention required by Measurement Canada?
- draft criteria include economic risk, trade sector compliance, consumer confidence and stakeholders' informed views

Special Address

SLIDE 5:

Strategies for Success - Alternate Service Delivery

Analysis of Alternate Service Delivery (ASD) options:

- determine which options can be used while ensuring the mission and mandate are met
- develop minimum criteria to be met by potential partners for selected ASD options, including non-performance sanctions
- identify incentives and possible barriers
- consult stakeholders and potential clients

SLIDE 6:

Strategies for Success - Service Excellence

Service excellence will be achieved by:

- setting measurable service standards
- developing a systematic approach to information gathering and establishing results-oriented performance measures
- consulting with clients and understanding their expectations
- recognizing that service excellence is an ongoing process

SLIDE 7:

Strategies for Success - Marketing and Communications

Measurement Canada will market the opportunities presented by its Strategic Direction, and the value of its contribution to a fair and efficient marketplace by:

- demonstrating the benefits of marketing to our colleagues within the Agency
- creating a marketing plan
- using visibility, resources and skills to keep the momentum going

SLIDE 8:

Strategies for Success - Quality Assurance

Quality assurance will become an integral part of Measurement Canada's programs and services by:

- identifying the elements of quality assurance to be used in Agency activities
- developing an implementation plan to phase in quality assurance in the various activities

SLIDE 9:

Strategies for Success - Work Environment, Skills and Knowledge

The value of employees will be supported by:

- training strategies enabling staff to adopt to changing roles in the future
- consistent application of training throughout the Agency
- mechanism to ensure future skills and knowledge requirements are identified and acted upon for all levels of staff

President's Address

Presented by Dr. Robert E. Hebner, Acting Director
National Institute of Standards and Technology

Good afternoon. It is especially rewarding to be able to speak with you today. I have spent most of my career working in laboratory-based research focusing on measurements and standards, and I have long understood their importance to the development and commercialization of new technologies. Even in my formative years, I had significant exposure to weights and measures.

I grew up on the Texas coastal plain at a time when cotton was king. My first salaried job was in a cotton gin, a small belt-driven factory that separated the cotton from its seed and compressed the cotton into bales. At that time, cotton was still picked by hand largely by crews of migrant workers augmented by locals with a little spare time.

The pickers were paid by the pound of cotton that they picked. Those of us who have ever done it appreciate how much work goes into picking a pound of cotton. The cotton was put into bags and when your picking sack was full, you took it to the trailer parked at the edge of the field. Attached to the side of the trailer was a rudimentary balance. You would weigh your sack, the farmer would record your name and how much you picked.

It is easy to imagine how either the farmers or the pickers could cheat using this system, and even when I'm in my most nostalgic mood, I know that people were not fundamentally more honest back in those days. So a system of checks involving the cotton gin evolved.

The farmer and one or more pickers would bring the trailer to the cotton gin. I would weigh the trailer, vacuum the cotton out of the trailer, reweigh the trailer to determine the tare, and calculate the weight of cotton. I would then calculate the total weight as determined by totaling each picker's weight as measured in the field. I would then use my determination of the total weight to re-calculate each picker's fair share. This was a weights and measures check and correction, done with pencil and paper, leaning against a tractor, with every step being checked in real time by both concerned parties. Thus, I have great empathy for inspectors who can't hide behind an anonymous letter, but who look people in the eye and say based on my measurements and calculations, there is a problem here and corrective action must be taken.

While it's a long way from the cotton fields of Texas, working as NIST's senior manager for the past 6 months has given me an even greater appreciation for the vital nature of our work in measurements and standards, especially as it relates to trends in trade, technology and international competitiveness.

I also have had the opportunity to do a bit of preaching about how the weights and measures function is crucial to equity in the marketplace and to consumer and industrial confidence in our system of trade. The reaction I usually get when I start spouting off on this subject is one of polite but sometimes feigned interest -- until I hit on a weights and measures issue that's really close to home.

The new study of milk and dairy product packaging that several of you in this room took part in is a perfect case in point. It's exactly the kind of weights and measures issue that everyone can relate to. I'll have a few words to say about that study a bit later.

Technology and Trade Changes

While touring the museum of the Patent and Trademark Office, like NIST another agency in the Department of Commerce, I recently learned that in 1266, England passed a law that required all bakers to put a distinguishing mark on each loaf of bread that they baked. This is considered to be an early use of a trademark. The purpose of this trademark was not advertising, however. It was to identify bakers who were making loaves that were too light. Clearly, what was important in the 13th century remains critical for trade as we enter the 21st century. I suppose this supports the old axiom that the more things change, the more they remain the same. But there's obviously much that has changed in the world of weights and measures and the marketplace, and I think it is critical that this community both reflect on those changes and anticipate what the future may bring.

There are two major themes to these changes: advances in technology and expanding global trade and competition. Clearly, the two are related.

Let's take a look back. Twenty years ago, how many among us would have predicted that the marketplace would be populated with digital weighing devices, that everything from bunches of grapes to truckloads of asphalt and concrete would be weighed by electronic scales? Twenty years ago, how many among us would have predicted that electronic scanners would be ubiquitous in the marketplace, that they would become the way of doing business not just in supermarkets but in nearly every kind of retail operation?

It's fair to say that the speed and market penetration of these technologies took most of us by surprise. But fortunately, I think we can point to these changes with some pride, because this community has done amazingly well in coping with these changes, in adapting to them, and in making them work for consumers, industry and regulatory officials alike.

Does that mean that there haven't been some pretty annoying bumps in the road? Of course not. There is plenty of work to do as we deal with these two electronic-based technology applications. A federal report that NIST was involved with last year reminded us that nothing is magic about price scanners, and that regulatory officials and businesses need to be vigilant to ensure that consumers receive what they pay for and that there is equity in the marketplace.

The electronics revolution is dramatically changing the environment for weights and measures in the U.S. But digital scales and price scanners are minor innovations compared with the headlong rush that we are experiencing with new modes of electronic commerce and the expanding potential of the Internet.

Along with all of the promise -- and the considerable hype -- there are plenty of barriers to making electronic commerce a seamless vehicle for conducting business, for exchanging goods and services.

NIST worries about this a lot. We are answering three key questions about what the United States needs to do to enable electronic commerce -- and then to address these needs. First, what are the measurement and standards needs? Next, what are the technology development needs? And third, how can we get the needed technology to our smaller businesses?

The weights and measures community needs to be asking questions also. What are the implications of the digital marketplace on the weights and measures infrastructure? How will the roles of the weights and measures officials and the industry weights and measures expert change? And perhaps the most intriguing question that needs to be answered: how can the weights and measures community take better advantage of electronic commerce and the Internet? At NIST we've got some ideas about that last question, and I will share them with you shortly.

For all of the changes that technology is bringing, they may be dwarfed by the changes that are occurring in our increasingly global marketplace. Gone are the days when most companies' customers were down the road or across the country. Competitors and customers may be located on the opposite side of the world, and U.S. firms that fail to recognize this change and respond to it promptly run the risk of a much greater failure as they see their business evaporate. A question of particular importance to this group is "What is the role of a state-based weights and measures program?" If we do our job well, it will be more important in a global market.

Specifically, as global market competition becomes more technology intensive and as trade becomes a more significant determinant of the health of the U.S. economy, the nation's measurement and standards infrastructure grows in economic importance and strategic value.

But even as global trade takes greater hold, it is being restrained by technical barriers to trade that are related to measurements, conformity assurance, and standards. NIST is assigned as the federal agency that should worry and help do something about those barriers, working with other agencies, state and local governments, and the private sector. I would like to review with you some of our responsibilities here.

We know that greater acceptance of uniform measurement, test and evaluation methods, and standards on a worldwide basis would make global commerce more efficient and less costly for the private sector. Recognizing the importance of standards in enhancing global commerce, other countries and trading regions aggressively advance their standards in the international arena in hopes of achieving a competitive advantage. The well organized efforts of the European Union, in particular, pose technical barriers to trade for U.S. industry.

NIST believes that if there is fair and open competition, U.S. companies can and will do well. Thus, the NIST approach is to reduce the measurement and standards-based technical barriers to trade faced by U.S. industry as follows:

-- Develop the required measurements and standards infrastructure to support international trade. We are responsible for taking the lead in setting the nation's measurements and standards agenda for the future;

-- Promote the harmonization of standards, codes and regulations; and assist industry in the cooperative development and acceptance of international standards;

-- Assist our trading partners in converting to international or American standards;

-- Promote the adoption of American standards as international standards, where appropriate;.

-- Promote international acceptance of U.S. measurement and accreditation systems;

-- Provide training in measurements and standards; and

-- Work with U.S. industry to overcome specific technical trade barriers.

For NIST, this means that we need to work with a variety of overseas and domestic organizations and individuals -- including NCWM -- to tackle these problems.

For the weights and measures experts, it means that we all must invest greater resources in learning about overseas requirements and restrictions on trade. These trade barriers are real -- and you know they are real if you find your goods barred from being unloaded at a foreign port.

If we are to level the international playing field, if we are to ensure that U.S. companies can compete on a fair basis, the weights and measures officials can and must help. As a first step, you must make learning more about international requirements an action item on your agenda. Ignorance is never good business, and ignorance about these changing requirements for product labeling, for instance, can do great harm to our U.S. businesses. Uniformity in the marketplace is a goal to strive for both here and overseas. Today, NIST is working so that U.S. package labeling practices are recognized worldwide. Your work to ensure NCWM requirements are technically rigorous and objectively based makes worldwide acceptance easier.

As a community, we have made much progress but there is still room for improvement in fostering marketplace uniformity. That's why I think the National Conference on Weights and Measures Chairman's theme for the next year is particularly appropriate: "Working Together for Equity." In the next few moments, I'd like to review some of our accomplishments and the goals which remain before us.

FDA Proposed Regulation

As many of you know, the Food and Drug Administration has proposed adopting NIST Handbook 133, "Checking the Net Contents of Packaged Goods." This action will establish a national standard for testing the net contents of packaged foods based on NIST Handbook 133. The proposed rule is a result of 5 years of hard work by the National Conference on Weights and Measures and the FDA. The FDA will be accepting public comments on the proposed rule until September 2.

Although some of us may disagree with some of the details in the proposed rule, having a standard is very important. Once the standard is in place, we will have a level playing field. Without one, the discrepancies among state regulations will only add confusion to the marketplace.

Although most states have adopted Handbook 133, many have not adopted the most current edition or the newest supplement. Adopting Handbook 133 as our national standard will even out the marketplace for industries in all 50 states. It also will help to ensure that packagers from state to state are using the same rules for compliance in packaging.

Adopting this rule and the inspection procedures laid out in Handbook 133 takes us a step closer toward equity in the marketplace. It also assists in leveling the competitive playing field for industry. This is of utmost importance as it will codify inspection procedures for all packaged foods in the United States.

Industry will be sure that from state to state, its products will be assessed by inspectors using the same procedures with the same training and education offered through NIST's Office of Weights and Measures. Consumers will have assurance that inspectors are using the most technically accurate and up-to-date methods for determining net content.

A consistent approach to the inspection of packaged goods will better position the United States to modify the procedures, if necessary, to stimulate the export of U.S. made products.

Milk Example

Let me give you an example of how Handbook 133 is being used to level the playing field in the dairy industry. A new federal/state study of short-filling of milk, other dairy products and juice found that over 40 percent of the groups of packages inspected contained less product than stated on their labels -- between 1 and 6 percent less.

This study, coordinated by the Federal Trade Commission, the NIST Office of Weights and Measures, the U.S. Department of Agriculture, and the Food and Drug Administration, was carried out by weights and measures personnel in 20 states chosen for broad geographic distribution. This study could not have been accomplished without this exemplary cooperation among the states and federal agencies.

A detailed report, "Milk: Does it Measure Up?" covers the study findings as well as steps already underway to prevent short-filling of milk and juice containers. State inspectors checked 1,638 lots of milk, other dairy products and juice in dairies, packaging plants, retailers, universities, schools and hospitals.

Just over 40 percent of the lots were rejected based on the inspection criteria. Results varied widely from state to state, dairy to dairy and even among carton sizes. The report concludes that "inadequate quality control in the packaging plants and a lack of strict oversight by manufacturers and distributors is the cause of many short-filling problems."

This study also points to the need for a uniform national standard for inspecting net contents. When the study results were released, one dairy in one state expressed concern about whether it failed based on the larger of its labeled net contents given in milliliters and ounces. The dairy in question had apparently misinterpreted labeling requirements and labeled with a higher metric volume than the equivalent fluid ounces. While the dairy's lots failed based on either the metric or English net content, industry and weights and measures officials would all benefit by having a uniform national inspection procedure.

As a result of the milk study, the NIST Office of Weights and Measures will provide training for dairy industry representatives in several locations around the United States in the coming months. We already have strong public statements from the dairy industry pledging that they are committed to solving this problem, and that's a welcome response for consumers, weights and measures officials, and competitors alike. This study should serve both as an incentive and a warning sign that we need to pay more attention to weights and measures in all parts of our community.

Weights and measures work is important to consumers to maintain confidence in an efficient system of commerce. It is important to companies to assure that their competitors play by the same rules they do. This story drives home the point that what you are doing is critically important to the economy.

Training

Another important aspect to this story is that we are trying to eliminate any future problems through training.

Training to address a specific problem, such as under-filling of milk, is just one of the training and education services offered by NIST's Office of Weights and Measures. NIST and the National Conference on Weights and Measures began the Instructor Training Program in 1995. Without this training, national studies, such as the milk survey, would not be possible.

To date, the Office of Weights and Measures has held 24 Instructor Training Schools for weights and measures officials and industry combined on NIST Handbook 133 "Checking the Net Content of Packaged Goods" and other topics.

The students trained in these courses agreed to implement Handbook 133 in their field inspection activities, to train other weights and measures inspectors within their states, and to serve as trainers for Office of Weights and Measures courses in other regions of the country. From the core of 40 students who completed Handbook 133 instructor training in 1995, more than 1,200 other officials have been trained.

I would like to emphasize just what an important link these trained weights and measures officials are in our efforts to work together for equity in the marketplace. Consumers in each state rely on them. Industry in each state relies on them. Fair and equitable trade across the entire country rests on their shoulders.

Just as a baseball game requires an umpire, trade requires weights and measures officials. Thus, weights and measures officials must be people of recognized integrity and people of recognized competence. Education at the state and national level are available to strengthen this link.

We have made training a top priority for NIST. It enables us to be a leader in solving equity problems quickly. It enables us to participate in national surveys in a potential problem area, rather than seeing only isolated symptoms of a problem in a single geographic area.

National Studies and National Database

The milk study was the fourth which we -- that is, NIST and the states -- have conducted in response to marketplace equity problems that have been called to our attention. Last fall the Federal Trade Commission released our joint price verification report on electronic scanner accuracy. We've also addressed equity in net content labeling in mulch and ketchup.

In each of these cases, we responded to problems or concerns presented to us by industry, by consumers and by the media. I would like to propose a new mode, a pro-active mode, for alerting us to potential marketplace equity problems. A nationally-accessible database of weights and measures inspections would be a new and improved way to do our jobs. A database like that could potentially flag a problem with a particular commodity early on.

Here's how it would work. The database could be maintained by the National Conference on Weights and Measures or the NIST Office of Weights and Measures. All states would be welcome to participate and participation would be completely voluntary.

The database would keep records of inspection results for various products by state. The database also would include routines for randomly selecting products or devices for inspection. For example, if inspectors in Kansas found problems with short-weighting of beans, they would enter their findings in the database. Other states then could be asked to conduct inspections. If a widespread problem is uncovered, it could be addressed with a coordinated effort and fixed rapidly.

The database could help us further our pursuit of equity by stimulating the conduct of inspections on a truly random basis. It could help us to identify and correct problems swiftly. This is important since those who are properly filling their packages suffer an unfair disadvantage when others short-weight theirs. The database would improve the effectiveness of weights and measures inspection programs as inspectors across the country could rapidly share information, and it could save considerable resources that could be put to use improving other aspects of the weights and measures system.

As I mentioned before, we need to take advantage of Internet capabilities. The potential for augmenting training by up-to-date information and individualized distance learning is tremendous. Improved information technology could stimulate national and regional cooperation that will make our local efforts better focused and more effective.

Equipment Loan Program

The success of our Instructor Training Schools has called to our attention another problem that we would like to help solve. There is a shortage or total lack of basic equipment and standards in many jurisdictions.

To address this need, the Office of Weights and Measures is sponsoring an equipment loan program. Glassware, thermometers and weight kits, for example, are available on a limited basis. You are eligible to receive equipment or standards if you or someone from your jurisdiction has attended the appropriate Instructor Training School.

Our approach is based on the assumption that if we lend you the tools you need, you can demonstrate the benefit to your jurisdiction. This should allow you to purchase the equipment that you need to do your jobs.

I regret that we do not have enough equipment for everyone. Equipment will be lent on a first come/most needed basis. If the need is greater than we anticipate, the Office of Weights and Measures will make every effort to obtain additional standards. All we ask is that you maintain the equipment and standards in proper working condition.

1525 Agreement

Another matter I'd like to call to your attention is the so-called "1525 Agreement" which will clarify and formalize the relationship between NIST and the National Conference on Weights and Measures.

Under paragraph 1525 of Title 15 of the U.S. Code, the Commerce Department, of which NIST is a part, has authority to enter into agreements with nonprofit organizations to carry out programs of mutual benefit.

In a strategic planning meeting in June, National Conference of Weights and Measures officers decided to go forward with a memorandum of understanding between the NCWM and NIST. Historically, no such agreement has existed since NCWM was formed in 1905. The agreement will acknowledge the relationship between NIST and the NCWM. This agreement won't improve the technical quality of what we do together. It will, however, tidy up a detail which was heretofore, overlooked.

Conclusion

I said earlier that it's hard to get the general public's attention for weights and measures matters unless you can give them an example that hits home -- and often that means something that hits them in their wallets or pocketbooks. I want to encourage each of you to carry some basic figures around with you in your wallets and pocketbooks, and to use these figures as frequently as you can.

Weights and measures regulations involve a large segment of our economy -- a huge segment, in fact. Last year, weights and measures regulations impacted on transactions of more than $4.13 trillion, or 54.5 percent of the $7.57 trillion U.S. Gross Domestic Product. That's plenty of reason for everyone to take the weights and measures function more seriously, and to give it the support that is so sorely needed.

Let me end by commending you for setting high goals and for doing good work. During the discussions with the Senate staff on the milk short-filling issue, the Federal Trade Commission representative called the state weights and measures officials the "unsung heros of fair trade." American industry and consumers owe you a debt of gratitude for your continued diligence in working together for equity.

I also want to extend my thanks and congratulations to those of you from industry who are working hard to deal with weights and measures issues every day -- and to urge you to work even harder to improve our system.

Thank you.

Chairman's Address to the 82nd Annual Meeting 1997

Presented by Barbara J. Bloch, Assistant Director
California Division of Measurement Standards

Honored guests, fellow members, friends, it is my pleasure to welcome you to the 82nd Annual National Conference on Weights and Measures.

First of all, let me say what an honor and a privilege it is to represent the National Conference as Chairman. I have had a tremendous year, due to the great support I've had from so many of you. I really believe the Conference is a world class organization, and what makes it so is the quality and professionalism of the membership. We have all the necessary ingredients; the commitment of our industry partners and the weights and measures community; and the support and assistance of NIST and OWM. We have had great success in our partnership between industry and the weights and measures community, which could serve as a model to many organizations. Sometimes the process gets a little rocky, but we seem to be able to put the welfare of the Conference ahead of any personal agendas. I am very proud to be associated with the National Conference on Weights and Measures.

We have had many issues before us this year, and have been faced with some difficult decisions with respect to resource allocations. As with any organization that has limited funds and multiple projects, it is never easy to set priorities. More than two years ago, Dave Edgerly of NIST, came to the Executive Committee and not only recommended, but supplied the initial funding, for the development of a strategic plan to guide Conference decisions. In looking back now, that may be one of the most important recommendations we have ever received. We believe that planning for the future is our most important task and in restarting our strategic planning efforts, we've made a significant commitment towards that goal. We've taken every possible opportunity this year to earnestly work on our plan, and met as recently as last Saturday. There are no shortcuts to strategic planning, but without this effort, we will just continue to drift along, dealing with the immediate issues, but not charting a course to deal effectively with our future.

I've been extremely fortunate to have the support of such a great Executive Committee--we have really worked as a team, and I believe, accomplished a lot this year. Much of the credit goes to Alan Rogers, our Treasurer, who has taken the initiative to implement many of the business decisions we've made.

To give you an update on our strategic planning efforts: to date we've published a draft of the mission, vision, values and goals for comments; and have identified 12 major objectives under those goals. Work groups have been established on several of the objectives, and we are focusing on three major areas to establish models for the other groups to follow.

We've also been aided in our process by Measurement Canada, who under Alan Johnston's direction are fully committed to their strategic planning project. While their weights and measures structure is different from ours, they have produced some model documents that we are looking at closely. We also had the opportunity to send Aves Thompson to one of their planning meetings which he found very valuable.

Some of the recent developments from our strategic planning efforts are:

**** Retained an attorney to represent the Conference and to advise and assist us in several areas:**

* exploring incorporation of the Conference to provide more structure and to minimize personal liability of members;

* securing critical liability insurance; something we haven't had in the past

* developing a memorandum of understanding between NIST/OWM and the Conference that more clearly defines our roles

* researching employee contracts for the future if the Conference becomes an employer

**** Enhanced the business aspects of the Conference by:**

* establishing a line of credit for purchasing

* acquiring credit card acceptance for registrations, and for ordering handbooks

* certifying the NTEP logo to provide for its continued use

* working with the Regionals to be able to accept dues from members for one or all Regionals along with Conference membership

* developing an Internet Homepage in conjunction with OWM

* with Gil's help, looking at copyrighting the Handbooks

**** Other areas of activity:**

* Expanding the training efforts-again NIST has played a major role in providing "train the trainer" classes, which have been outstanding. We extend our thanks to Gil for his efforts. There are several classes still planned, and the Conference has additional grant funds which will be used for training that the A&P Committee is managing.

* Supporting the work of the Program Evaluation Work Group, which had planned to pilot a data management project for package inspection and retail motor fuel dispensers. Many of us see this as a high priority, but the necessary resource commitment must be part of our long range planning decisions.

* Recognizing the work of the FDA for its proposal to adopt regulations consistent with Handbook 133-- I believe that the Conference has made a significant step forward towards one uniform national standard through this proposal. We've waited a long time for this, and without the work that Ken Butcher has done in developing the proposal with FDA, it would not have been accomplished. I know we have some differences, particularly in the tare procedures, but hope we can work through those and support the basic proposal.

I owe many thank you's--to Darrell and Lynne Guensler, who's support over the years has been unflagging.

To our California staff, who have handled my responsibilities during the many weeks I've been traveling.

To Steve Malone, who has been great to work with--and I know the Conference is in great hands for the next two years with Steve and Aves Thompson. I know you will give them the same level of support you've provided to me.

To Gil Ugiansky and his fine staff--the technical support you provide makes the Conference effective; we could not make the progress we do without you.

To our friends and associates in the Central Region; Sid Colbrook and his Illinois State staff; and Caroline Shoenberger and her City of Chicago staff, who have been such gracious hosts and helped to make this meeting such a success.

To our Associate members, who provide the balance we need to develop reasonable requirements we can all live with; and of course to the regulatory community who have made such a strong commitment to national uniformity.

To all the members of the various Committees and working groups for their hard work. I know first hand how difficult it is to juggle jurisdictional workloads with Conference business, so I greatly appreciate these extra efforts.

And last but not at all least--to our neighbors to the north; our Canadian colleagues, who contribute so much to this Conference and have been so willing to share information with us.

In closing, I just want you to know how much your confidence and trust has meant to me this year--thank you.

HONOR AWARDS

10 YEARS

Charles A. Burns, Jr.
Tina Butcher
Victor Gerber
Richard Greek
Michael Grenier
Ronald Hayes
David Heck
Jack Jefferies
Mark Joelson
Ted F. Johnson
Gerry Jorowski
Patrick Marino
Stan Millay
Edwin Price
J. Alan Rogers
Ed Romano
Louis Straub

15 YEARS

Wes Diggs
L. F. Eason
Vernon Massey
Steve McGuire
Dennis Schaffer

20 YEARS

Harold Bradshaw
Mike Belue
Ann Turner
John Pugh
Robert Williams

Special Recognition Awards

The success of this Conference is the result of the dedication and hard work of many individual members. The work of the following members was recognized at the general session for their contributions over the past years within their respective committees and for their contributions to the National Conference in general.

Executive Committee

Bruce Adams, State of Minnesota
Charles Carroll, State of Massachusetts

Laws and Regulations Committee

Stan Millay, State of Maine

Specifications and Tolerances Committee

Allan Nelson, State of Connecticut

Administration and Public Affairs Committee

Ed Price, State of Texas

Vice-Chairmen

Michael Pinagel, State of Michigan
Lou Straub, State of Maryland
Aves Thompson, State of Alaska
Courtney Yelle, Bucks County, Pennsylvania

Sergeants-at-Arms
Dan Downing, City of Chicago, IL
Paul King, City of Chicago, IL

Metrology Subcommittee
Richard Calkins, Rice Lake Weighing Systems

Special Service Awards
Dave Edgerly, NIST
Otto Warnlof, NIST

Associate Membership Committee

The associate members have contributed immeasurably to the many achievements of the Conference, most notably the development and widespread acceptance of the National Type Evaluation Program, the National Training Program, and Handbooks 44, 130, and 133. Today, we have even more involvement with our business partners in such activities as the Type Evaluation Technical Committee Sectors, Handbook 133 Working Group, Petroleum Subcommittee, and MultipleDimension Measuring Devices Working Group. A Certificate of Appreciation was presented to the Associate Membership from the NCWM.

Annual Committees

Budget Review Committee
Darrell Guensler, State of California

Auditing Committee
Monty Hopper, Kern County, California

Credentials Committee
Comos Insalaca, Fresno County, California
Angelique McCoy, State of Ohio

Nominating Committee
Charles Gardner, Suffolk County, New York
Sidney Colbrook, State of Illinois
Thomas Geiler, Barnstable County, MA
Darrell Guensler, State of California
Allan Nelson, State of Connecticut
N. David Smith, State of North Carolina
James Truex, State of Ohio

Resolutions Committee
Cathryn Pittman, State of Tennesse
David Wallace, State of Colorado

President's Award

This was the twelfth annual presentation of the President's Award. This award is given for two levels of achievement:

1) A banner presented to those directors representing States that have 100 percent membership, both State and local weights and measures officials, in the National Conference on Weights and Measures for the first time in the

2) The second level of the President's Award is a certificate presented to any State in which all of the weights and measures officials from the State office are members of the Conference.

Awards For First Year Banner

The **State of Louisiana** received a banner for first year membership of all State weights and measures officials.

Streamer Awards for the Second Year

The State of Texas

Streamer Awards for the Fourth Year

The State of Nevada
The State of Tennessee

Streamer Awards For The Fifth Year

The Territory of The Virgin Islands
The State of West Virginia

Streamer Awards For The Sixth Year

The Commonwealth of Puerto Rico

Streamer Awards for the Seventh Year

The State of Colorado

Streamer Awards for the Eighth Year

The State of Montana
The State of Oregon
The State of Utah
The State of Vermont
The State of Wyoming

Streamer Awards For The Ninth Year

The State of Arizona
The State of Michigan
The State of New Hampshire

Streamer Awards for the Eleventh Year

The State of Alaska
The State of Delaware
The State of Idaho
The State of Kansas
The State of New Mexico
The State of South Dakota

Streamer Awards for the Twelfth Year

The following two States have had 100 percent membership in the National Conference on Weights and Measures for their States since the beginning of the award. These two States continue to participate 100 percent in the membership program:

The State of Arkansas
and
The State of Nebraska

President's Certificate

Eight States qualified for the President's Certificate with 100 percent of their State office staff members for the 1996-97 Conference year:

Third Year Award
State of Missouri

Fourth Year Award
State of Connecticut

Fifth Year Award
State of Massachusetts

Sixth Year Awards
State of Illinois
State of Indiana

Eighth Year Awards
State of Maine
State of New York
State of Wisconsin

Report of the Executive Committee and National Type Evaluation Program Board of Governors

Barbara J. Bloch, Chairman
Director
California Division of Measurement Standards

Charles A. Gardner, Chairman of the NTEP Board of Governors
Director, Weights and Measures
Suffolk Co., NY

100 Introduction

This is the Report of the Executive Committee and the National Type Evaluation Program (NTEP) Board of Governors for the 82nd Annual Meeting of the National Conference on Weights and Measures (NCWM). The Report is based on the Interim Report offered in NCWM Publication 16, Program and Committee Reports; the Addendum Sheets issued at the Annual Meeting; and actions taken by the membership at the Voting Session of the Annual Meeting.

The Report is divided into two parts: (1) management of the National Conference on Weights and Measures (items in the 101 Series) and (2) management of NTEP (items in the 102 Series), as addressed by the Committee in its role as the NTEP Board of Governors. Table A, which is an index of reference key items included in the report, lists the reference key number, title, and page number for each item. Voting items are indicated with a "V" after the item number. An "I" denotes issues that are reported for information. Items marked with a "W" have been withdrawn. Table B lists the Appendices to the report, and Table C provides a summary of the results of the voting on the Committee's items and the report in entirety.

Table A
Index to Reference Key Items

Table A (Continued)
Index to Reference Key Items

Table B
Appendices

Table C
Voting Results

Reference Key No.	House of State Representatives		House of Delegates		Results
	Yes	No	Yes	No	
Executive Committee (Report in its Entirety)	43	0	65	0	Passed
102-8	42	0	62	0	Passed
NTEP Board of Governors (BOG Report in its Entirety)	42	0	59	0	Passed

Detail of Items

Part I - Executive Committee

101-1 I Constitution and Bylaws: Strategic Planning

This item was carried over from Item 101-4 of the Report of the 80th NCWM, 1995, and Item 101-2 of the Report of the 81st NCWM, 1996. See those reports for background information.

As part of its ongoing effort to develop and maintain a strategic plan for the NCWM, the Executive Committee and the Strategic Planning Subcommittee held a special planning meeting October 6 to 8, 1996, in Gaithersburg, MD. During the meeting, the vision, values, mission, and goals statements were revised as follows:

Vision

The National Conference on Weights and Measures will be the national and international leader in measurement standards development and legal metrology training. The Conference will be the focus for the collection, retrieval, and dissemination of information related to weights and measures.

Values

The National Conference on Weights and Measures is dedicated to a fair and equitable marketplace free from trade barriers and is committed to maintaining the highest ethical standards. The National Conference on Weights and Measures stands for leadership in weights and measures issues, quality service to its members, and quality weights and measures education. The Conference is dedicated to providing a forum for all points of view and to ensuring open communications.

Mission

The National Conference on Weights and Measures is a measurement standards development organization comprised of individuals and associations representing government, industry, and consumer interests. The Conference provides a forum to promote a fair and equitable marketplace for anyone involved in buying and selling goods or services by weight, measure, or count.

Goals

I. **Enhance the National Conference on Weights and Measures as a national and international resource for measurement standards development.**

II. **Provide uniform training programs for industry and government individuals involved in legal metrology.**

III. **Continue to develop new or alternative methods for improved delivery of weights and measures programs.**

IV. **Continue to expand the Conference role in national and international legal metrology.**

The meeting participants also began developing a list of objectives for meeting the goals.

Just prior to the 1997 NCWM Interim Meeting, another planning meeting was held to further discuss the objectives, begin developing model work plans and form working groups to develop action plans for meeting the objectives. The planning process continued throughout the week of the Interim Meeting. Comments received on the vision, values, mission, or goals statements were reviewed and new working groups were formed. The resulting list of objectives and the working groups that have been formed to date are shown in Appendix A.

At the 1997 Annual Meeting, the Mission Statement was further revised to include a reference to uniformity (the underlined words were added):

Mission

The National Conference on Weights and Measures is a measurement standards development organization comprised of individuals and associations representing government, industry, and consumer interests. The Conference provides a forum to promote uniformity in weights and measures laws, standards, and practices and to foster a fair and equitable marketplace for anyone involved in buying and selling goods or services by weight, measure, or count.

101-2A I Constitution and Bylaws: Revision

This item was carried over from Item 101-5 of the Report of the 80th NCWM, 1995, and Item 101-3 of the Report of the 81st NCWM, 1996.

In 1995, some of the members of the Executive Committee expressed concern that the NCWM Constitution and Bylaws (NCWM Publication 1) did not contain all of the policies for managing the Conference that had been adopted by the membership. The Committee's Technical Advisor was asked to do a search of the Reports of the Conference over the preceding 10-year period to identify policies related to the management of the NCWM that had been adopted by the Conference but had not been incorporated in Publication 1.

The policies found by the Technical Advisor were compiled into a proposed new section of Publication 1 and presented to the Committee for consideration at the 1996 Interim Meeting. Some of the policies had been reprinted in NCWM Publication 3, NCWM Policy, Interpretations, and Guidelines, but others had only been published in the Conference reports. During the review of the proposed addition, Committee members pointed out other changes that were needed to Publication 1; consequently, the Committee's Technical Advisor was asked to prepare a comprehensive revision of Publication 1 that would bring the document up to date and include the changes noted by the Committee.

At the 1997 Interim Meeting, the draft revision was reviewed and modified. The Committee decided to split Item 101-2 into two parts: 101-2A on the proposed changes to the existing Constitution and Bylaws and 101-2B on the proposed new policy section and to publish both parts for comment. The proposed changes to the existing Constitution and Bylaws and the rationale for the changes are contained in Appendix B.

As part of the Strategic Planning process, the Committee plans to look at the composition and terms of the Executive Committee and the Board of Governors. Additional changes may be proposed as a result of that review.

101-2B I Constitution and Bylaws: Revision, Addition of Policy Section

See Item 101-2A above for background information. The Committee is planning to add a new section to the Constitution and Bylaws that would contain selected policies related to the management of the NCWM that have been adopted by the Conference. A draft of the proposed new section is provided in Appendix C for comment.

101-3 I Associate Membership Committee Bylaws

The Associate Membership Committee (AMC) of the NCWM is a committee organized to represent the interests of the associate membership of the NCWM pursuant to the Constitution (Article V, Section 2) and Bylaws (Article V, Sections 1D and 5K) of the NCWM (NCWM Publication 1). In the Report of the 63rd National Conference on Weights and Measures (1978), a proposed Charter defining the function of the AMC was included for informational purposes. In recognition of changes within the NCWM, as well as with the role of the associate membership, the AMC determined that its existing Charter should be reviewed and, where necessary, revised. A draft of proposed Bylaws was published in the Agenda for the Interim Meeting. Minor changes to the Bylaws were made at the Interim Meeting.

At the 1997 Annual Meeting, the Associate Membership Committee made additional changes to its Bylaws and then approved the document. The revised Bylaws, which replace the existing Charter, are attached to this report as Appendix D.

101-4 I Finances, Treasurer's Report

NCWM Treasurer J. Alan Rogers presented a report on the Conference's finances to the Executive Committee at the Interim Meeting. (For more information, see: 1) the separate Treasurer's Report in this publication for the Fiscal Year 1996 Report and 2) the Report of the 81st NCWM 1996 for the 1997 NCWM and NTEP budgets.)

Mr. Rogers raised a question about the status of the funds collected from industry for participation in the metrology seminars jointly sponsored by NIST and NCWM. He suggested that guidelines are needed regarding who determines how the money is spent and how the funds should be entered in the NCWM accounting system. The Executive Committee will ask Budget Review Committee members to develop recommendations concerning the metrology funds at their meeting in June 1997.

At the Annual Meeting, the Executive Committee reviewed recommendations made by the Budget Review Committee regarding the 1998 budget. The Committee adopted the BRC's recommendation to increase the registration fees for the Annual Meeting by $50 beginning in July 1998; as a result, the registration fee for members will increase to $200. The fee was increased to ensure that the registration fees would fully cover the costs of the meeting. The Committee also adopted a recommendation to establish a $25 registration fee for first-time weights and measures attendees of the NCWM Annual and Interim Meetings from the host region to help offset the costs of the meetings. The Executive Committee reduced the BRC's proposed budget for NTEP by $10,000. A copy of the 1998 budget adopted by the Executive Committee is attached to this Report as Appendix O.

101-5 I Finances, Auditing Committee

The actual income and expenses for 1996 were reviewed by the Auditing Committee at the Interim Meeting. Auditing Committee Chairman Monty Hopper reported that the Conference's books were in good order. (See the Auditing Committee's report.)

Mr. Hopper recommended that the Executive Committee consider getting an independent audit of the Conference's books because it has been about 10 years since the last one. Questions were raised about the cost of an audit, the recommended frequency of such audits, and the form they should take (e.g., written or oral or both). The Committee asked the Strategic Planning Work Group concerned with developing the NCWM business plan to take up the issue of getting an independent audit of the Conference's finances and make recommendations to the Executive Committee.

At the Annual Meeting, the Executive Committee agreed to obtain an independent audit of the Conference's finances. The Conference Treasurer was asked to make arrangements for the audit by July 1998.

101-6 I Finances, Associate Membership Committee

A status report was given by AMC Chairman Richard L. Davis. He said that the AMC is committed to using its excess funds to support Conference objectives. Recently the funding has been used to provide grants for field inspector training and public

relations training. (See the Administration and Public Affairs Committee report for the status of the AMC grants awarded in 1996/1997.) Mr. Davis said the AMC would appreciate suggestions from the NCWM membership on innovative ways in which the excess AMC money could be used.

The AMC reported at the 1997 Annual Meeting that, for the time period between August 1, 1997, and July 31, 1998, it will again be happy to provide a total of 52 $500 scholarships to be administered by the A&P Committee for field inspector training. From that total, the AMC instructs the A&P Committee to allow one $500 scholarship for each regional weights and measures association for the purpose of publishing their newsletter if they issue a request for this purpose.

101-7 I Organization, Appointments, and Assignments, Status Report

The following is a summary of Chairman Bloch's appointments as of the 1997 Interim Meeting:

To the Executive Committee:
Aves Thompson, AK, 3 years (replacing Sharon Rhoades, AZ)

To the Metrology Subcommittee:
Steve McGuire, IL (replacing Jim Akey, WI)

To the Laws and Regulations Committee:
Robert Williams, TN, 5 years
Claire Regan, Grocery Manufacturers of America, Associate Member Representative

To the Specifications and Tolerances Committee:
George Shefcheck, OR, 5 years

To the Administration and Public Affairs Committee:
Richard Philmon, IL, 5 years

To the Nominating Committee:
Sidney Colbrook, IL, 1 year
Thomas Geiler, Barnstable, MA, 1 year
Darrell Guensler, CA, 1 year
Allan Nelson, CT, 1 year
N. David Smith, NC, 1 year
James Truex, OH, 1 year

To the Budget Review Committee:
William Corey, American Frozen Foods, 4 years

To the NTETC Weighing Sector:
John Hughes, Weigh-Tronix, Inc.
Larry Turberville, AL (public sector rep.)
Charles Carter, OK (public sector rep.)
George Shefcheck, OR (public sector rep.)
Richard Suiter, NE (public sector rep.)

To the NTETC Belt Conveyor Sector:
Tom Vormittag, Sr., Commercial Testing & Engineering Co.

To the NTETC Grain Moisture Meter and Near-Infrared Protein Analyzer Sectors:
John Miller, CSC Scientific Company, Inc.

Chaplain: J. Michael Hile, AR, 1 year

Assistant Treasurer: Fred Clem, Columbus, OH, 1 year

Four public sector representatives (see the list above) were added to the NTETC Weighing Sector at the request of the Sector's Technical Advisor to improve the balance between public and private sector interests.

At the Interim Meeting, the Chairman also established a number of Work Groups to assist in the Executive Committee's Strategic Planning Effort. See Appendix A for a list of the Work Groups established and the individuals appointed to serve on them.

Between the Interim and the Annual Meetings, Chairman Bloch made the following appointments:

To the Handbook 133 Working Group:
Dennis Johannes, CA (replacing Aves Thompson)

To the Petroleum Subcommittee:
Bob Dinneen, Renewable Fuels Association
Marilyn Herman, Herman & Associates

To the Budget Review Committee:
Harvey Lodge, Cargotec, Inc. (replacing David English)

Sergeants-At-Arms:
Dan Downing, City of Chicago, IL
Paul King, City of Chicago, IL

To the NTETC Weighing Sector:
David Hawkins, Fancor, Inc. (replacing Michael Adams)

To the NTETC Grain Moisture Meter/Near-Infrared Protein Analyzer Sectors:
Tim Conwell, CSC Scientific Company, Inc.

Martin J. Clements, The Steinlite Corporation
Cassie Eigenmann, DICKEY-john Corp.
Keith Locklin, Grain Elevator & Processing Soc.
Raymond Oberg, Zeltex, Inc.
Clifford Watson, Consultant
Hiro Yamahira, Kett Electric Laboratory

Additionally, the Metrology Subcommittee is being restructured to include public member representation only, continuing with an open meeting format to encourage all interested industry members to participate.

101-8 I Organization, Establishment of an Internet Home Page Subcommittee

The Southern Weights and Measures Association (SWMA) proposed that the NCWM Executive Committee appoint a subcommittee, with representatives from all regions, to study the feasibility of establishing an Internet Home Page that would be owned and operated by the NCWM. SWMA suggested that the subcommittee could formulate the content of the Home Page and develop a plan for establishing and maintaining it.

SWMA's justification for the proposal was that the current Home Page used by the NCWM, which is operated by NIST, is limited in scope due to personnel limitations and Federal access guidelines. They believe the Home Page should contain, for example, all NIST Handbooks adopted by the NCWM, Conference Reports, NTEP Certificates of Conformance, and Annual Meeting agendas. In addition, they would like each regional weights and measures association to use and maintain a sub-Home Page, which would reflect the activities of that association.

The Committee decided that, instead of appointing a separate subcommittee to address this issue, it would ask the Strategic Planning Work Group concerned with developing a plan for improving information dissemination to look into the feasibility of developing an NCWM Internet Home Page. The Committee also authorized the Treasurer to: 1) make arrangements for the NCWM to begin processing credit cards and 2) proceed with domain name registration to establish the NCWM on the Internet. The acceptance of credit cards is seen as a first step toward eventually selling NCWM memberships and publications over the Internet. Domain name registration would allow the Conference to reserve a specific domain name (e.g., "www.NCWM.org") for possible use in the future.

At the strategic planning meeting held in June 1997, Conference officers accepted an offer from the NIST Office of Weights and Measures (OWM) to establish an NCWM Home Page on the Internet server at NIST. The Internet address for the Home Page is: http://www.nist.gov/ncwm; the Home Page currently contains an introductory graphic that was provided by OWM and information on the NCWM that was included on the OWM Home Page. Karl Angell, WV, has volunteered to plan and implement the Home Page. The Executive Committee has asked the Administration and Public Affairs Committee to work with Mr. Angell on this project.

101-9 I Publications, Status Report

The NIST Office of Weights and Measures (OWM) reported to the Committee on the status of NIST and NCWM publications and provided a summary of the distribution level and costs of the publications. OWM noted that Handbook 44, Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices, and Handbook 130, Uniform Laws and Regulations, had been completed along with the Report of the 81st NCWM, 1996.

At the 1997 Annual Meeting, OWM distributed an updated summary of the distribution level, income, and costs of selected NIST and NCWM publications as of June 30, 1997, and a revised publication calendar for Fiscal Year 1997 (see the Publications Cost Estimates table and Publications Calendar on the next two pages).

1997 NIST and NCWM Publication Summary

(As of June 30, 1997)

NIST Publications				
NIST Publication Title	**Quantity**	**Total Printing Costs**	**Total Postage (NIST)**	**Total Printing & Postage**
Handbook 44 1996 edition	3,500	$9,000.00	$6,090.00	$15,090.00
SP 906 Report of 80th NCWM	5,225	11,000.00	6,950.00	17,950.00
Handbook 130 1996 edition	3,500	6,900.00	5,355.00	12,255.00
Totals (All NIST Expense)	**12,225**	**$26,900.00**	**$18,395.00**	**$45,295.00**

NCWM Publications and Membership Mailing (Printed at Conference Expense) Publications Mailed at NIST Expense)					
1997 Pub 2 Membership Directory	2,190	$9,500.00 (NCWM)		$3,810.00	$13,310.00
Pub 5 Index of Device Evaluations, 9th Edition	400		$3,410.00 (NTEP)	612.00	4,011.00
Pub 15 Interim Agenda	3,355	3,976.00 (NCWM)		6,307.00 (First Class)	10,283.00
Pub 16 Program & Committee Reports (Announcement Book)	3,500	7,800.00		5,075.00	12,875.00
Totals	**9445**	**$21,276.00 (NCWM)**	**$3,410.00 (NTEP)**	**$15,804.00**	**$40,479. 00**

1996-1997 NCWM Membership Renewals and Invitations to Join					
Renewals and Invitations (printing at NCWM expense postage & mailing service paid by NIST)	**Quantity**	**Printing (NCWM)**	**Mailing Service (NIST)**	**Total Postage**	**Total Printing, Postage & Mailing Service**
Totals	**17,200**	**$1,533.00**	**$524.00**	**$5,504.00**	**$7,561.00**

Summary

Total Printing at NIST Expense	Total Postage/Mailing Service at NIST Expense	NIST Grand Total (Postage and Printing)
$26,900.00	$40,227.00	$67,127.00

Total NCWM Printing Costs	NTEP (Printing Only Applicable)
$22,809.00	$3,410.00

Fiscal Year 1997 OWM Publications Calendar

Status as of 6/30/97

Month	Publication	Comments
October	Report of the 81st NCWM Handbook 44 - 1997 Handbook 130 - 1997 NCWM Pub 9 - Nom Comm Rpt	Completed Completed Completed Just for Nominating Comm - Completed
November	W&M Today Newsletter	Contains information on Interim Mtg. - Completed
December	NCWM Pub 15 - Interim Agenda	Completed
January	NCWM Pub 5, 9th ed. NTEP CCs	Completed
February	W&M Today Newsletter	Completed
May	NCWM Pub 1 NCWM Bylaws NCWM Pub 2 NCWM Directory NCWM Pub 16 Prog & Comm Rpt NCWM Pub 5, Supp 1, NTEP CCs W&M Today Newsletter NCWM Pub 14 NTEP Admin.	No new edition was published because there were no changes to the document. Completed Completed Completed Completed Completed
June	NCWM Pub 10 Conduct of Annual Meeting NIST Handbook 105-3 NIST Handbook 105-4 NIST Handbook 105-7 Handbook 143 State Lab Handbook Revision	Completed Completed Completed Completed Completed
July	NIST Handbook 105-5 NIST Handbook 105-6	Going through the NIST editorial review process. Going through the NIST editorial review process.
August	W&M Today Newsletter NCWM Publication 21 Petroleum Safety Manual Revision	To contain Annual Mtg. summaries.
September	Module 24 Revision NCWM Pub 5, Supp 2, NTEP CCs	

101-10 I Membership, Status Report

The total membership of the NCWM as of January 1, 1997, was 3,085, which is 8.4 percent less than the total at the same time last year (3,371). Although 614 new members joined during the year (19.9% of the total), this is the second year in a row that overall membership has declined. The Committee asked OWM to obtain information on members who did not renew their memberships in 1996 from the NCWM database and analyze it to determine if any particular patterns are apparent.

As of June 30, 1997, the total membership of the NCWM was 3,284. The total number of members is down from the previous year for the second year in a row. The membership breakdown by category is as follows:

State	-	964 (29%)	Foreign Industry	-	45 (1%)
County	-	380 (12%)	U.S. Government	-	43 (1%)
City	-	183 (6%)	Foreign Government	-	35 (1%)
U.S. Industry	-	1,594 (49%)	State/local, not w&m	-	40 (1%)

OWM reported that its review of the individuals who did not renew their memberships indicated that industry membership is often issue driven; that is, individuals join the NCWM to work on a particular issue and drop their memberships once the issue has been resolved.

See Appendix E for a breakdown of the composition of the NCWM mailing list from 1995-1997.

101-11 I Meetings, Networking with Other Associations

Chairman Bloch reported on the numerous meetings that she and other NCWM officers had attended since taking office in July 1996, including regional weights and measures association meetings, industry association meetings, and international meetings.

The Committee reviewed the status of its efforts to assist the regional weights and measures associations in increasing their membership (see Item 101-11 in the Committee's report to the 81st NCWM for more information). Actions taken since the 1996 Interim Meeting include inviting the regional associations to set up displays at the 1996 Annual Meeting and requesting them to send association information to NIST/OWM for distribution through the Weights and Measures Fax-Line. In addition, the NCWM membership renewal forms were modified to include a box that could be used to request information on the regional associations; however, as of the 1997 Interim Meeting, only the Western Weights and Measures Association (WWMA) had supplied all of the information needed to respond to these requests.

The Committee decided to take the following additional actions to help the regional groups during the next year :

- Invite the regional groups to set up displays at the Annual Meeting in Chicago.
- Make the WWMA's membership materials available to the other regions so that they can use them as a model to develop their own materials.
- Ask OWM to put the regional membership information in the:
    1. NCWM Organization Chart
    2. Conference meeting agendas
    3. OWM Internet Home Page and the Weights and Measures Fax-Line
- Include a box to check for regional information on NCWM membership forms.

In the discussion of this item, several NCWM Associate Members mentioned that the cost of cutting checks these days is quite high in relation to the cost of the individual regional membership fees. They stated that the cost savings resulting from being able to pay for the NCWM membership and regional association membership at the same time with one check might encourage more companies to join one or more regional associations. Consequently, the Committee asked the NCWM Treasurer to work with OWM and representatives of the regional associations to develop a plan to collect fees for membership in the regional associations along with the NCWM membership fees.

During the 1997 Interim Meeting, the Executive Committee met with each of the other NCWM Standing Committees to hear about their major issues and any concerns they had. The meetings were felt to be helpful in keeping the lines of communication open within the Conference.

At the Annual Meeting, it was reported that OWM had received membership materials from all four of the regional weights and measures associations. The membership materials were added to the Weights and Measures Fax-Line, and a list of the

membership contacts was added to the NCWM organizational chart and the NCWM newsletter; the materials will be added to the NCWM Home Page in the future.

According to the NCWM Treasurer, plans to enable members to pay regional weights and measures association dues at the same time as NCWM dues with only one check are underway.

101-12 I Meetings, Annual and Interim, Future

1998 Interim Meeting
The 1998 Interim Meeting will be in San Antonio, TX, at the St. Anthony Hotel from January 11 to 15.

1998 Annual Meeting
The 1998 Annual Meeting will be in Portland, OR, at the Hilton Hotel from July 12 to 16.

1999 Interim Meeting
The Committee is considering going back to San Antonio for this meeting. The Conference Coordinator has been asked to also look at other possible locations in the South.

1999 Annual Meeting
Burlington, VT, has been selected as the site of this meeting.

Future Meetings
The year 2001 marks 100 years since the founding of the NCWM's parent organization, the National Institute of Standards and Technology (NIST) in 1901. NIST plans to celebrate its Centennial with special events throughout the year. In recognition of NIST's Centennial, it was proposed that the NCWM's 86th Annual Meeting in 2001 be held in the Washington, DC, area and that special commemorative activities be planned for that meeting to recognize NIST for its role in promoting uniformity in weights and measures laws, standards, and practices. The Executive Committee agreed with the proposal and selected the Washington, DC, area as the site for the NCWM's 86th Annual Meeting in 2001. It is the intention of the Committee to adhere to the following schedule for future Annual Meetings of the Conference: 1999 - Northeast region; 2000 - Southern region; 2002- Central region; 2003 - Western region.

The Committee is now considering sites for the Annual Meetings through 2003. The regional weights and measures associations have been asked to submit proposals for two or three sites (in priority order) for upcoming meetings in their areas.

Canada has volunteered to host a Conference meeting sometime in the future. Although it may not be possible to hold an Annual Meeting in Canada, the Executive Committee will explore the possibility of holding other smaller NCWM meetings in Canada.

The idea of holding the NCWM Interim Meeting later in January or early in February was discussed. When the meeting is scheduled in early January, the holiday season can make meeting preparations difficult; for example, it is harder to get Agenda materials printed and delivered in a timely manner. Many people take leave during the holidays and may not be in their offices to receive and review meeting materials or develop comments for the Standing Committees. Meetings held out of town are particularly difficult to organize because materials and equipment must be shipped to the meeting site well in advance of the meeting. A change in date would give OWM staff, NCWM Officers and Standing Committee members, and Associate Members more time to get ready for the meeting.

101-13 W Meetings, Elimination of Conference Outing

(This item was withdrawn.)

A member of the Central Weights and Measures Association proposed that the Executive Committee and the Associate Membership Committee eliminate the Conference Outing at the NCWM Annual Meeting, which is jointly sponsored by industry and the NCWM.

The proposal stated that the money spent on the outing could be used to support training and other high priority AMC/NCWM projects. Last year, $18,554 was spent on the outing: $11,132 from Associate Membership funds and $7,421 from NCWM funds. The proposal said it was difficult to justify this type of cost for an outing, especially when some of the funds come from industry

dues. In addition, it was mentioned that an increase in NCWM dues is being discussed, and the individual making the proposal felt that before any increases are implemented, consideration should be given to making better use of existing funds.

The proposal indicated that one of the reasons for an industry night (which later evolved into the joint outing) was to eliminate individual hospitality rooms; however, hospitality rooms are still used by groups that have specific issues before the Conference. It was noted that the outing enables attendees to socialize with other Conference members; however, the Chairman's reception serves the same purpose. As an additional consideration, the proposal says that government officials should not permit industry to pay most of the costs for a social outing.

This item was withdrawn by the Executive Committee at the Interim Meeting. There was unanimous support for maintaining the Conference Outing and sharing expenses for the Outing with the Associate membership. Members of the Committee feel that the Outing makes an important contribution to the success of the Conference.

101-14 I Program, OWM and NIST

The NCWM Executive Secretary and Chief of the NIST Office of Weights and Measures (OWM), Dr. Gilbert M. Ugiansky, gave a status report on OWM activities. He described the success of the instructor training program being conducted by NIST/OWM in cooperation with the NCWM. He said that NIST management felt the training program was an example of a program that could really make a difference; consequently, OWM was given additional funding specifically to support the training effort. Some of this additional funding ($75,000) was added last year to the NIST grant to NCWM for the development of training materials and presentation of training for State and local weights and measures officials. The funds were also used to cover the costs of individuals attending the instructor training seminars.

Dr. Ugiansky announced that Tom Coleman has been designated as the lead person for training in OWM. In addition, he indicated that a contractor was being sought to assist Mr. Coleman in planning and presenting training programs for NCWM members.

Debbie Ripley is leaving OWM to work with Sam Chappell in the NIST Technical Standards Activities Program, which is responsible for NIST interactions with the Organization of Legal Metrology (OIML). OWM now has two vacant slots in its Device Technology Group, which coordinates the National Type Evaluation Program and provides technical assistance to a number of NCWM committees including the Specifications and Tolerances Committee.

OWM is planning to contract with Ann Turner to continue providing Conference planning and financial services after she retires from OWM this year.

At the Annual Meeting, Dr. Ugiansky provided a status report on the NIST Office of Weights and Measures since the Interim Meeting. He announced that OWM had recently hired two new staff members, Tom Ahrens and Dick Suiter.

101-15 I Program, International Organization of Legal Metrology (OIML)

David E. Edgerly, Deputy Director of NIST's Technology Services, addressed the Executive Committee on the importance of NCWM participation in OIML. Mr. Edgerly, who managed the OIML program at NIST from 1975 to 1988 before assuming his present position, said that OIML has grown in importance over the last 10 years. He noted that there is a growing interest on the part of U.S. industries in marketing their products overseas; however, they are finding that, in order to do so, they must comply with OIML and other international standards that are not necessarily compatible with U.S. standards. Some foreign regional organizations, such as the European Union, have been working very hard at promoting the adoption of their standards as OIML standards. The United States usually does not have any input into the development of these regional standards, which sometimes contain requirements that can cause problems for U.S. manufacturers; consequently, participation by U.S. interests in international standardization activities is essential to reduce trade barriers.

The United States is a member of OIML and thus has a moral obligation to adopt OIML standards, according to Mr. Edgerly; consequently, we should do more to ensure that the standards are not detrimental to U.S. interests. He encouraged members of the NCWM to actively participate in OIML and try to get NIST Handbook 44 requirements incorporated in OIML standards. He noted that NCWM technical experts should participate at the Committee and Subcommittee levels within OIML, rather than at the Plenary Sessions because that is where they could have the greatest impact.

Mr. Edgerly said that U.S. industry has been playing a more active role in OIML, but U.S. regulatory interests have not been adequately represented. He suggested that representatives of weights and measures regulators with the appropriate skills and knowledge be selected to participate for an extended period of time (2 or 3 years) on selected U.S. Technical Advisory Groups

that develop the U.S. positions on OIML documents. Such participation does not have to mean attendance at a lot of meetings, he noted; it could be limited to providing comments on documents by mail or over the Internet.

Dr. Sam Chappell, Chief of the NIST Technical Standards Activities Program, reported on U.S. participation in OIML standards development activities in legal metrology.

Dr. Chappell agreed with Mr. Edgerly on the need for greater involvement by NCWM members in the OIML process. He said that participation in OIML activities would not only help U.S. industry but could be beneficial to the work of the NCWM Specifications and Tolerances Committee and Laws and Regulations Committee. He volunteered to work with the NCWM to identify the specific OIML activities in which NCWM representatives should participate. He noted that Central and South America and Pacific rim countries are becoming important markets for the United States; therefore, participation in the standardization activities of these regions would also be beneficial.

In 1995, Darrell A. Guensler, Director, Division of Measurement Standards, CA Department of Food and Agriculture, attended the Second Asia-Pacific Legal Metrology Forum (APLMF), the OIML Developmental Council Meeting and Symposium, and a meeting of the International Committee of Legal Metrology (CIML) in Beijing, People's Republic of China, with Dr. Chappell. Based on his participation in the APLMF meeting, Mr. Guensler made the following recommendations to the NCWM:

1) *Continue active participation in the Forum. Its objectives are consistent with other APEC forums and should help promote the elimination of non-tariff trade barriers in the Asia-Pacific region.*

2) *Participate in the intercomparison on pattern approval testing of nonautomatic weighing instruments. This study will help to evaluate the possibility of expanding the U.S.-Canada Mutual Recognition Agreement on Pattern Approval to other regional countries.*

3) *Urge NIST to become a participant in the "Mutual Recognition Agreement" working party and volunteer to assist NIST in this endeavor. This working party will perform an important role in identifying appropriate legal metrology links between economies in many areas important to NCWM.*

Mr. Guensler made the following recommendations to the NCWM based on his participation in the OIML/CIML meetings:

1) *Continue active participation in OIML at this level. This will allow the NCWM to be more aware of and influential in the policy decisions and resolutions of OIML. Our interests in reciprocal pattern approval systems, production meets type issues, and the general globalization of legal metrology demand that we have a say in our own destiny.*

2) *Develop a relationship with other regional metrology groups such as the Western European Legal Metrology Cooperation (WELMEC). WELMEC is quite similar to NCWM in that it serves as a collaborating body between legal metrology authorities in Western Europe much the way NCWM serves the United States. WELMEC's principal aim of establishing harmony and a consistent approach to legal metrology in Europe is in concert with NCWM aims for the United States. There is an obvious advantage to comparable organizations such as NCWM and WELMEC working together to share knowledge and develop consistent resolution to similar problems. Additionally, such a relationship can further the development of harmonized requirements and mutual recognition agreements.*

3) *Consider establishing a program for developing countries that includes sponsoring first time attendance at NCWM conferences for a delegate from such a country. This recommendation is prompted by a suggestion from Mr. K. Ramful, Controller of Weights and Measures for Mauritius. Mauritius is a small island country in the Indian Ocean with a population of approximately 1.2 million. Mr. Ramful informed me that they use Handbook 44 as their guide for device regulation. Such a program could further the interests of the NCWM in providing needed information, harmonization, and training for constituents outside our borders but within our scope of influence.*

In partial response to Mr. Guensler's recommendations, NCWM Chairman Barbara Bloch and NTEP Board of Governors Chairman Charles Gardner attended the Third APLMF Meeting in Vancouver, Canada, on November 1 and 3, 1996, and the 10th

International Conference of Legal Metrology (OIML) and the 31st meeting of the International Committee of Legal Metrology (CIML) on November 4 through 8, 1996. A copy of their report of the meetings can be found in Appendix G.

Their recommendations to the NCWM with regard to APLMF are:

1. Support the active participation of the National Institute of Standards and Technology (NIST) in the APLMF. As the United States has a well-developed legal metrology program, we are in a position to influence the standards development of the APLMF, who are major trading partners of the United States. Further, the objectives of the APLMF are consistent with other Asia -Pacific Economic Cooperation (APEC) forums, and U.S. participation should help to promote the elimination of non-tariff trade barriers in the Asia-Pacific region.

2. Determine the appropriate level of NCWM involvement in the APLMF. Certainly, the NCWM should be a resource for NIST in developing U.S. positions on issues before the APLMF, but the issue of active participation in the APLMF should be a subject in our Strategic Planning project.

3. Continue participation in the intercomparison on pattern approval by agreeing to become part of the load cell intercomparison working group. This series of intercomparisons will help to evaluate the possibility of expanding the U.S.-Canada Mutual Recognition Agreement on Pattern Approval to other countries.

4. Request NIST (OWM) input on the feasibility of participation in the intercomparison of mass standards in order to notify the Convenor of U.S. intentions in this area.

Their recommendations to the NCWM with regard to OIML are:

1. Support the active participation of NIST in OIML, particularly at the Working Party levels and offer to serve as a resource to NIST on OIML issues. We believe that it is critical for the NIST representatives who are presenting the U.S. positions at OIML to be knowledgeable as to the workings of the NCWM and of the requirements of the Handbooks. Without this continued involvement and knowledge, the United States will find it difficult, if not impossible, to influence international standards. We would further recommend that a cooperative dialogue be established with NIST, OWM, and the Conference to determine how this could be accomplished.

2. Determine the appropriate level of NCWM involvement in OIML as part of the Strategic Planning Project. Our interests in mutual recognition of pattern approval systems, production meets type issues, and the world marketplace make it imperative that we participate in OIML at some level.

3. Support the recommendation made last year by Darrell Guensler to develop a relationship with other regional metrology groups such as the Western European Legal Metrology Cooperation (WELMEC). In addition to the similarities described in the previous recommendation, WELMEC is very active in the area of computer software approvals, which could assist the NCWM in making a decision in this area.

4. Mr. Guensler recommended consideration of establishing a program for developing countries that includes sponsoring first-time attendance at NCWM Conferences for a delegate from such a country. We respectfully recommend that such consideration become a part of the Conference's Strategic Planning Project, to be included in the development of the NCWM business plan.

The Committee took the following actions with respect to the recommendations received (actions taken in response to a recommendation from Mr. Guensler are indicated by the initials "DG" below, and those taken in response to a recommendation from Ms. Bloch and Mr. Gardner are indicated by the initials "G/B"):

Committee Actions Concerning APLMF:

1. The Committee supports the active participation of NIST in the APLMF and requests that the Executive Secretary transmit this support to the appropriate officials in NIST. (G/B) The Committee also supports determining the appropriate level of NCWM involvement in APLMF via the Strategic Planning project and

authorizes Dick Suiter, Chairman of the Working Group on the development of the NTEP Business Plan to contact Sam Chappell's office to begin work on this issue. (G/B/DG)

2. The Committee supports NCWM participation in the intercomparison on pattern approval of testing of nonautomatic weighing instruments and has authorized the necessary funds for testing by the Ohio and California NTEP laboratories. (DG)

3. The Committee supports continued participation in the intercomparison on pattern approval in load cell testing and requests the Executive Secretary to transmit this support to the appropriate office within NIST. The load cell intercomparison project would need to be handled by the NIST Force Group as the sizes to be tested are beyond the capability of the State NTEP laboratories. (G/B)

4. The Committee supports NIST participation in the intercomparison of mass standards and requests that the Executive Secretary transmit this support to the appropriate office within NIST. (G/B)

5. The Committee supports the active participation of NIST in the "Mutual Recognition Agreement" working party and requests the Executive Secretary to transmit this support to the appropriate officials within NIST. The Committee would further support determining how the NCWM could be of assistance to NIST in this endeavor. (DG)

Committee Actions Concerning OIML:

1. The Committee supports the active participation of NIST in OIML, particularly at the Working Party level for the reasons stated in the recommendation, and requests that the Executive Secretary transmit this support to the appropriate officials at NIST. (G/B) Further, the Committee supports determining the appropriate level of NCWM participation in OIML via the Strategic Planning project and authorizes Dick Suiter, Chairman of the Working Group on development of the NTEP Business Plan, to contact Sam Chappell's office to begin work on this issue. (G/B/DG)

2. The Committee supports developing a relationship with other regional metrology groups and has directed Barbara Bloch to prepare a letter to WELMAC Chairman, Seton Bennett, indicating the Conference's interest in initiating such a relationship; in addition, it requests that Dick Suiter, Chairman of the Working Group on development of the NTEP Business Plan, add this item to that agenda for further discussion. (G/B/DG)

3. The Committee supports consideration of sponsoring first-time attendance of delegates from other countries via the Strategic Planning project and requests that Aves Thompson, Chairman of the Working Group on development of the NCWM Business Plan, add this item to that agenda for further discussion. (G/B/DG)

The Committee thanks Mr. Guensler, Ms. Bloch, and Mr. Gardner for their participation in the 1995 and 1996 APLMF/OIML meetings and for their recommendations.

At the 1997 NCWM Annual Meeting, the Executive Committee received an updated report from Dr. Chappell on U.S. participation in OIML standards development activities in legal metrology, a copy of which is included in Appendix F.

101-16 I U.S. - Canada Mutual Recognition of Type Evaluation Program Report

This item was carried over from Item 101-7 of the Report of the 79th NCWM, 1994, Item 102-2 of the Report of the 80th NCWM, 1995, and Item 101-3 of the Report of the 81st NCWM, 1996.

The U.S./Canada Mutual Recognition of Type Evaluation Program, implemented in April 1994, allows staff of the U.S. National Type Evaluation Program and the Approval Services Laboratory of Measurement Canada to perform type approvals of weighing devices to the common and unique requirements of both countries. As a result, a single type evaluation and series of tests satisfies the evaluation requirements of both countries, eliminating the duplication of approval work. Each country continues to issue its own Certificate of Conformance (United States) or Notice of Approval (Canada) on the basis of the evaluation and test results.

In 1996 the Mutual Recognition Program was expanded to include computing scales, complex indicators, and mechanical scales. The Program now covers:

1) electronic computing and non-computing bench and floor scales up to 1000-kg or 2000-lb capacity;
2) separate weighing/load-receiving elements up to 1000-kg or 2000-lb capacity;
3) separate electronic weight-indicating elements (except those that are "software-based"; i.e., programmed by downloading parameters); and
4) mechanical scales up to 10 000-kg or 20 000-lb capacity.

A draft letter formally announcing the expanded program to U.S. manufacturers was reviewed by the Committee at the 1997 Interim Meeting. Copies of a Measurement Canada Bulletin announcing the expanded program were also provided to the Committee.

A question was raised concerning the future expansion of the program to cover liquid-measuring devices. The response was that work in this area has been constrained by a lack of resources in OWM. Ms. Roussy noted that Canada has offered the use of its Liquefied Petroleum Gas (LPG) testing facilities for NTEP testing of LPG liquid-measuring devices. She was asked if Measurement Canada would be willing to do NTEP tests on other types of liquid-measuring devices and indicated that she would explore the possibility. The Committee agreed that expansion of the Mutual Recognition Program to include liquid-measuring devices should be considered during its strategic planning process.

Ms. Roussy reported on an agreement between the United States and Canada on the mutual recognition of railway scale test car calibrations. Under the agreement, the National Research Council of Canada (NRC) and its U.S. counterpart, the National Institute of Standards and Technology (NIST), will mutually recognize the equivalence and accuracy of their respective national standards. Measurement Canada has agreed to issue calibration certificates for railway scale test cars calibrated and certified by NIST or under its authority. The United States has already been, for some time, accepting the use of Canadian calibrated and certified railway test cars for inspection purposes. Ms. Roussy said that a meeting is scheduled for March 1997 to make plans for a round robin to check the calibration procedures of the two countries. In the meantime, she said, the recognition program will proceed.

At the Annual Meeting Tina Butcher of OWM provided the Committee with an update on this item. Her remarks are summarized below:

> ***Weighing Devices.*** A memorandum was distributed April 25, 1997 to "Holders of NTEP Certificates of Conformance (CCs) for Weighing and Related Devices, Manufacturers of Weighing Devices, and Other Interested Parties." This memorandum announced the expansion of the program to include the evaluation of different device types [see paragraph 3 of this item for a list of the devices currently covered under the program].
>
> The joint application for submitting devices has been updated to reflect the expanded areas and is available through the NCWM fax-on-demand system. The U.S./CD Applicant's Guide was also updated and is also available through the fax-on-demand system.
>
> A joint meeting of the Canadian and U.S. laboratory personnel was held in conjunction with the combined NTEP Laboratory meeting in San Diego, CA, in May 1997.
>
> Last year Canada advised NTEP of plans to effect major revisions to their scales requirements. After going through various legislative phases, the proposed changes have been published in the *Canada Gazette* (similar to the U.S.' Federal Register) for comments and, if all goes well, may be effective by September 1997.
>
> ***Measuring Devices.*** No additional progress has been made in this area due to a limitation of resources. Consideration should be given in the strategic plan to expanding the program to include measuring devices. As with all activities, this must be weighed against other critical NTEP and device activities.
>
> At BOG Chairman Charles Gardner's request, a draft response to Sonia Roussy, Measurement Canada, has been prepared which responds favorably to Canada's offer to use their LPG facilities for NTEP evaluations and revisits the possibility of using Canada's other metering facilities for NTEP tests with the idea of establishing the groundwork for mutual recognition in this area as well.

The Committee adopted Mrs. Butcher's recommendation to give consideration in the strategic plan to expanding the Mutual Recognition Program to include measuring devices. The Committee also reviewed and approved the letter she had drafted for Sonia Roussy.

101-17 I Strategic Planning in Canada

Sonia Roussy, Vice President Policy, Measurement Canada, who serves as the Canadian Technical Advisor to the Executive Committee, reported on the the strategic planning activities of her organization, a newly formed agency of Industry Canada that has responsibility for the country's weights and measures program. Copies of the overheads that she used in her presentation are in Appendix H.

At the Interim Meeting, Ms. Roussy, who has been an active participant in the Executive Committee's strategic planning effort, issued an invitation to Executive Committee members to participate in the Canadian strategic planning process. Plans are being made for a member of the Committee to attend the next Canadian planning meeting.

101-18 I Metrology Subcommittee Report

L. F. Eason, Chairman of the Metrology Subcommittee reported to the Executive Committee on a meeting he attended for the Conference on the formation of the National Council for Laboratory Accreditation (NACLA), a proposed public/private entity that will work toward: 1) developing uniform, national procedures for accrediting U.S. testing and calibration laboratories; 2) creating an infrastructure in which accreditors recognized as competent by NACLA can be considered for acceptance for both domestic and international requirements; 3) establishing a truly North American System for laboratory accreditation; and 4) serving as the primary U.S. signatory on behalf of NACLA members for new international laboratory accreditation agreements. Mr. Eason said that he believed the goals of the organization were worthwhile, and he recommended that the Executive Committee nominate an NCWM representative to serve on the Interim Board of NACLA. [Shortly after the Interim Meeting, the Committee pursued the possibility of having a representative on the Board, but it was determined that the cost in time and funding required to serve on the Board was more of a commitment than had been anticipated; consequently, alternative roles in NACLA are being evaluated.]

Mr. Eason also reported on the activities of the Metrology Subcommittee. A copy of his report is included in Appendix I.

The Metrology Subcommittee met with the Executive Committee at the 1997 Annual Meeting and provided a verbal update on its activities. The Subcommittee presented revised recommendations for action to the Executive Committee (see the Subcommittee's July Report in Appendix I). The Executive Committee addressed the Subcommittee's recommendation concerning accreditation of the State legal metrology laboratories; it plans to consider the other revised recommendations at the 1998 Interim Meeting. The Executive Committee believes that the State laboratories are the cornerstone of our national measurement system. The Committee encourages NIST management to provide the resources necessary for the State laboratories to achieve NVLAP accreditation.

Part II - NTEP Board of Governors

102-1 I OIML Certificate Project

This item was carried over from Item 102-6 of the Report of the 79th NCWM, 1994, Item 102-1 of the Report of the 80th NCWM, 1995, and Item 102-1A of the Report of the 81st NCWM, 1996.

In 1995, the NIST/NCWM National Type Evaluation Program was named as the U.S. Issuing Authority for non-automatic weighing devices (OIML R76) and load cells (OIML R60). NTEP's efforts in this area have been in response to requests from industry for assistance in eliminating trade barriers for U.S. manufacturers exporting products.

Tina Butcher of NIST reported at the 1997 Interim Meeting that the arrangements to begin issuing OIML R60 certificates for load cells were just about complete. She said the NIST Force Group and the Office of Weights and Measures had worked with a contractor to develop the software needed to automate the presentation of test data in the R60 Annex A format and was in the process of making some minor modifications. She stated that NTEP would go forward with an announcement of the initiation of the R60 program. According to Mrs. Butcher, the initial scope of the program would be limited to those capacities that are tested by the Force Group; however, plans are being made to expand the program to include capacities tested by the California NTEP Participating Laboratory as well.

At the Annual Meeting, Tina Butcher of OWM provided the Board of Governors (BOG) with an update on this item, which is summarized below (Mrs. Butcher's recommendations to the BOG are shown in italics):

R60 Load Cells.
A memorandum was distributed April 25, 1997, to "Holders of NTEP CCs for Load Cells and Weighing Devices, Manufacturers of Weighing Devices, and Other Interested Parties." This memorandum announced that NTEP is now accepting applications for evaluation of certain capacities of load cells to OIML R60 requirements. Applicants can choose to have an OIML test performed, an NTEP test, or both tests by indicating their choice at the time of application. Costs for the evaluation are:

OIML test OR NTEP test only:	$4,000 for first cell and $2,000 for second cell (of the same model) submitted at the same time
combined OIML/NTEP test:	$6,000 for first cell and $2,000 for second cell (of the same model) submitted at the same time

At present, the capacities of cells accepted under the program are limited to those tested by the NIST Force Group. NTEP plans to expand OIML test capability to include testing of those capacities of cells tested by CA in the future.

Successful evaluation to both NTEP and R60 requirements will result in an NTEP CC and (after required registration of the OIML Certificate) a U.S. OIML R60 Certificate.

A revised load cell checklist is available through the NCWM fax-on-demand system.

To date, no requests have been received to evaluate load cells to R60 requirements.

Recommendation: It is recommended that the BOG authorize participation of a representative from the NIST Force Group and/or the CA lab in the meetings of the U.S. National Working Group for R60 (or possibly some international working group [IWG] meetings if the need arises). Should participation in the IWG meetings be deemed necessary, the BOG would be asked to review and authorize such participation. To facilitate this participation, the BOG should ask that Sam Chappell's office schedule NWG meetings in conjunction with other weights and measures related meetings as much as possible.

R76 Non-Automatic Weighing Instruments.
The Ohio and California laboratories participated in a round robin test of an R76 device; the round robin or intercomparison was sponsored by the Asia Pacific Legal Metrology Forum. Both laboratories report that the experience was very beneficial in preparing to begin offering R76 tests through NTEP.

Both labs have been polled to ask when they might be ready to begin offering R76 tests in addition to NTEP tests on a routine basis. While both labs indicate a readiness from a technical standpoint to begin testing in the near future (OH and CA can be ready by September 1; OWM can complete the administrative preparations by Oct 1), some reservations were expressed about the additional work load and its impact on the current NTEP testing. (R76 tests are anticipated to double the length of time for the evaluation of the scale; this affects not only the scale being evaluated, but devices in line behind it in the OH and CA labs.) A particular area of concern for one lab is the development of R76-2 in an electronic form which would enable electronic entry of data from R76 tests; the lab noted that the paperwork requirements for completing this form manually were significant.

OWM shares the concerns expressed by the labs about the impact of the additional work load, particularly since one NTEP lab is currently accepting no new work until their backlog is eliminated and industry continues to express concern about the length of NTEP evaluations. In addition, participation of an NTEP representative in at least the U.S. National Working Group Meetings for R76 (and possible International Working Group Meetings) is essential.

Recommendation: The BOG is asked to consider the following to keep the project moving and minimize impact on the program:

1) ask for volunteers from industry to develop electronic data entry forms in the R76-2 format (alternatively, the BOG might consider contracting for someone to develop these forms);

2) announce acceptance of R-76 tests by October 1 or upon completion of electronic forms, whichever comes first;

3) authorize participation of an OH or CA lab representative in R76 National Working Group Meetings (the BOG would be consulted if participation in an International Working Group Meeting is deemed necessary); and

4) revisit this issue at the January 1998 Interim Meeting to discuss the status and impact of this project.

The BOG took the following actions on Mrs. Butcher's recommendations:

- Authorized the Chairman of the BOG to write Jim Truex, OH, and Steve Cook, CA, and request their participation in the R60 and R76 National Working Group Meetings respectively.
- Authorized the Chairman of the BOG to contact Sam Chappell of the OIML program at NIST and discuss the continued scheduling of National Working Group meetings in conjunction with other weights and measures meetings as much as possible.
- Authorized the Chairman of the BOG to ask for volunteers from industry to develop electronic data entry forms in the R76-2 format.
- Agreed to revisit this issue at the January 1998 Interim Meeting to discuss the status and impact of this project.

102-2 I Test Data Exchange Agreements (formerly called "Mutual Recognition")

This item was carried over from Item 102-1B of the Report of the 81st NCWM, 1996.

At the July 1995 Annual Meeting, the NTEP Board of Governors reviewed draft language for an agreement between the NCWM and the Nederlands Meetinstituut (NMi) that would establish mutual recognition of tests performed on load cells in accordance with OIML Recommendation R60 as part of the process of issuing an OIML Certificate. Based upon comments from industry, the BOG asked that the language be revised to indicate that NMi would recognize testing performed by NTEP laboratories for use in issuing a European Community (EC) Certificate.

The draft language was presented to NMi during a visit to NMi by NTEP representatives in September 1995. During the visit, NMi representatives advised that EC Certificates are not presently issued for components such as load cells; however, a report of test could be issued by an EC country for reference in an EC Certificate. NMi returned the draft to NTEP with some additional changes suggested by their legal staff. The draft was updated to indicate the changes suggested by NMi. The revised draft language was presented to the Weighing Sector of the National Type Evaluation Technical Committee for review and comment at the Sector's Fall 1995 meeting. It was also discussed at the Fall 1995 meeting of the Scale Manufacturers Association (SMA).

At the 1996 Interim Meeting, SMA said that it would support going forward with the agreement. It was reported, however, that NTEP wanted an agreement that did not require official signatures whereas NMi wanted a signed agreement. David Edgerly, Deputy Director, NIST Technology Services, told the BOG that NIST had said it would no longer sign bilateral agreements, preferring instead to participate in regional international agreements; therefore, NIST might not support NTEP going forward with the agreement. Since other countries had expressed an interest in developing agreements with NTEP that were similar to the NMi agreement, some NCWM Associate members felt there was a need to clarify the policy on these agreements with NIST management.

SMA staff discussed the policy on bilateral agreements with NIST officials at the 1996 Annual Meeting and were informed that NIST had been instructed by its parent agency, the U.S. Department of Commerce (DOC), not to be a party to bilateral agreements. It was agreed, however, that SMA could make its case to Commerce officials for agreements on the exchange of test data packages.

At a meeting with a DOC representative, SMA was told that the agency would have no objection to NIST proceeding with the data exchange agreements provided that they did not in any way bind the parties to accept any approvals granted by the other party. Since there was no intent to do so, SMA concluded that the plans to enter into the NMi agreement and similar agreements with other countries could go forward. Daryl Tonini of SMA reported the results of the meeting to NIST officials who said the way appeared clear to continue with the agreements but referred the decision to do so to the NCWM BOG. Mr. Edgerly agreed to develop guidelines for executing bilateral agreements at NIST; the guidelines were published prior to the 1997 Interim Meeting.

SMA recommended to the BOG: that it go ahead with the agreements, that the agreements should be nonexclusive (not limited to any one country), and that the agreement with NMi on load cells (R60) should be the first priority. No objections to the recommendations were raised by BOG members. OWM was asked to proceed with the agreements as time and resources permit, beginning with the NMi agreement.

At the 1997 Annual Meeting, the BOG agreed to pursue the agreement with NMi as resources permit.

102-3 I Adoption of Uniform Regulation for National Type Evaluation by the States

Daryl Tonini, Scale Manufacturers Association (SMA), updated the Board of Governors on the status of SMA's drive to assist States to adopt the Uniform Regulation for National Type Evaluation (URNTE) and the Uniform Regulation for the Voluntary Registration of Servicepersons and Service Agencies (VRR). Mr. Tonini said that the NTEP requirements should be implemented in Alaska by the end of June 1997. He also stated that a meeting was planned with the Secretary of Agriculture in Vermont in February to discuss NTEP.

Mr. Tonini said that while most of the States have now adopted the NTEP requirements, there are still concerns on the part of industry about uniformity because the NTEP requirements are being interpreted differently by the States. He commended the OWM Instructor Training program for promoting uniformity.

An update was given by Mr. Tonini at the 1997 Annual Meeting. He announced that the States of Tennessee and Washington had adopted the Uniform Regulation for National Type Evaluation. (See the map on the next page for the updated status of State adoption of the URNTE and VRR.)


Maine 1
New Hempshire - 1
Massachusetts - 2
Rhode Island - 5
Connecticut - 1
New Jersey - 1
Deleware - 3
Maryland - 2
Vermont 3 - 4
New York 2
Pennsylvania 2
Virginia 1
West Virginia 1
North Carolina 1
South Carolina 1
Georgia 1
Florida 3 - 4
Ohio 1
Michigan 2
Indiana 4
Kentucky 3
Tennessee 1
Alabama 1
Mississippi 1
Wisconsin 1
Illinois 1
Minnesota 1
Iowa 1
Missouri 1
Arkanses 1
Louisiana 1
North Dakota 3
South Dakota 1
Nebraska 1
Kansas 1
Oklahoma 1
Texas 3 - 4
Montana 3-4
Wyoming 1
Coloredo 1
New Mexico 3 - 4
Idaho 1
Utah 1
Arizona 1
Nevada 1
Weshington 1
Oregon 2
California 1
Alaska 3 - 4
Hawaii 1
Virgin Islands 5
Puerto Rico 1
1 - URNTE + VRR
2 - URNTE, No VRR
3 - VRR, No URNTE
4 - Under Consideration
5 - No URNTE, No VRR
S M A
July, 1997
URNTE: Uniform Regulation for National Type Evaluation
VRR: Uniform Regulation for the Voluntary Registration of Service Persons and Service Agents

102-4 I NTEP Policy: Separate CCs for Software

(This item was changed from a voting item to an information item.)

This item was carried over from Item 102-9 of the Report of the 80th NCWM, 1995, and Item 102-5 of the Report of the 81st NCWM, 1996.

The Scale Manufacturers Association asked the NTEP Board of Governors (BOG) to look at the issue of software as it applies to NTEP. Concern has been expressed over the NTEP policy of issuing separate CCs for software. Although the issue was initiated by SMA's request, it applies to all types of devices.

In its 1995 Report, the BOG recommended that NTEP continue, for the present, to evaluate stand-alone software with the same procedures used to evaluate software that is part of a measuring or weighing system; however, it endorsed the establishment of a Software Work Group, composed of volunteers from weighing, measuring, and other sectors, as well as participants from the NTEP Participating Laboratories, the S&T Committee, and Canada, to study this issue.

In December 1994, the Work Group was formed. It had its initial meeting in April 1995 and a second meeting during the 1995 Annual Meeting. At the 1996 Interim Meeting, Work Group Chairman Michael Adams of Fairbanks Scales said that the Group members supported NTEP continuing to issue separate CCs for software. He stated that the Group believed that there was more to accomplish in such areas as revision of the type evaluation checklists to cover software, development of a definition for "metrologically significant software," and education; therefore, they recommended that the Work Group be continued through the next Interim Meeting.

The Executive Committee agreed to continue the Work Group through the 1997 Interim Meeting so that members could complete their evaluations of NTEP checklists and make recommendations to the appropriate NTETC Sectors.

At the Annual Meeting of the Southern Weights and Measures Association (SWMA) in October 1996, the following proposal was adopted and forwarded to the NTEP BOG for consideration at the 1997 NCWM Interim Meeting:

> "Given the complexities of subjecting software associated with weighing and measuring devices to NTEP approval and the difficulties weights and measures field inspectors encounter in their field tests of such software, the Southern Weights and Measures Association requests a suspension of NTEP stand-alone software evaluation activities until the NCWM adopts an NTEP policy addressing the evaluation of software associated with weighing and measuring devices."

The BOG considered SWMA's proposal at the 1997 Interim Meeting. They also heard concerns raised about possible charges of restriction of trade as a result of no longer issuing CC's for software. For example, it was suggested that software manufacturers might complain that their businesses were negatively impacted because they could no longer receive NTEP CCs for their software while manufacturers of weighing and measuring systems that included software could. On the other hand, manufacturers of complete devices that have been issued a CC might claim that they were put at a competitive disadvantage because they had to go to expense of getting NTEP approval each time a change was made to the device's software while manufacturers of software did not. The BOG concluded that a legal opinion on this issue was needed. OWM was asked to pursue this matter and report back to the BOG before the 1997 Annual Meeting.

In a joint session with the S&T Committee, the Board witnessed a special demonstration showing the problems associated with software that had not been approved by NTEP. The demonstration was presented by members of the Software Work Group. Individuals participating in the demonstration were Jeff Bell of NCR, Darrell Flocken and Sonia Rarey of Mettler-Toledo, and Larry Martins of Unibridge. Examples of what can happen when software is not evaluated included noncomplying software that allows customers to readily change metrological parameters and software that ignored motion detection and thus permitted incorrect weights to be recorded.

In the discussion following the demonstration, some NCWM members expressed concern that even software that had gone through the type evaluation process could be tampered with and changed to give incorrect information. Others responded that if people really want to perpetrate fraud, they will find a way to do so; NTEP does, however, provide the States with a tool to prevent potentially fraudulent devices from entering the marketplace and to remove these devices if the software no longer complies with or is no longer supported by the original CC. In addition, it was noted that the type evaluation process helps manufacturers identify and correct areas of noncompliance before their software is installed in devices at many different field sites and is then more difficult to correct.

Based on the possible legal implications of halting the issuance of CCs for software and the demonstrated benefits of having software go through the NTEP process, the BOG decided to continue to permit software to be evaluated by NTEP for the time being and to put the issue to a vote of the NCWM membership in July. Depending on the outcome of the vote, a decision would be made on the future of the Software Work Group.

Recommendation: Continue to permit separate NTEP Certificates of Conformance to be issued for software for weighing or measuring devices.

At the 1997 Annual Meeting, the BOG decided to make this an information item because of a number of unresolved issues that were identified at the meeting. The Board agreed to re-form the Software Work Group under its direction, and, in the interim, any submissions of software for evaluation must be evaluated as a part of a complete system to ensure compliance with Handbook 44 requirements. In addition, the evaluation must include at least one field test.

102-5 I NTEP Participating Laboratories and Evaluations Report

The NTEP Participating Laboratories report prepared by the NIST Office of Weights and Measures (OWM) indicates that both the number of applications for type evaluations and the number of Certificates of Conformance issued increased in 1996 (see the table in Appendix J for a summary of the report). OWM staff announced that the Oklahoma State metrology laboratory has been added as an NTEP laboratory for field performance testing of vehicle scales. They also reported that efforts to reduce the time it takes to issue CCs are continuing. Various processes within the office are being studied to determine how to make the whole system work more efficiently. One problem that has been identified as a part of this effort involves manufacturers who take their devices directly to one of the NTEP Participating Laboratories rather than going through the NTEP office at NIST. This disrupts the NTEP process and unfairly impacts manufacturers who follow the procedures. The BOG asked OWM to bring the problem to the attention of the various NTETC Sectors and ask for recommendations.

The NTEP Board of Governors (BOG) has been monitoring the situation regarding the late payment of NTEP maintenance fees over the last several years. Delays in fee payments cause a number of problems including delays in the publication of NCWM Publication 5, NTEP Index of Device Evaluations. While there has been some improvement over the last 2 years, the number of manufacturers who do not meet the initial OWM deadline for payment of fees is still too large; consequently, the BOG has approved the establishment of a progressive system of late fees to go into effect in the fall of 1997. Manufacturers who still had not paid their 1997 fees by the time of the Interim Meeting, were given a one-time opportunity to pay their fees with a penalty of $100 per certificate before the certificates became inactive.

At the Annual Meeting, the Board agreed to the following policy regarding the annual maintenance fees for NTEP Certificates of Conformance:

1. When a CC is issued, the device manufacturer will be given a copy of the payment schedule for maintenance fees.
2. Annually on September 1, invoices for CC maintenance fees will be sent to manufacturers along with a letter outlining the NTEP late fee policy as follows:
   - Maintenance fees are due and payable and to be received at OWM no later than 10/31.
   - If paid after 11/30 and before January 1, the maintenance fee increases to $150 per certificate.
   - If the fee is not paid by January 1, the Certificate of Conformance becomes inactive and will be listed as inactive in NCWM Publication 5. Manufacturers who want to reactivate an inactive CC will be charged $550 per CC and a new CC number will be issued.
3. A second notice will be sent to all manufacturers who have not paid their fees by 10/31. The notice will be sent out as soon as possible after 10/31 and will remind manufacturers that they will have to pay a late fee if payment is not received before 12/1.
4. If the fees have not been paid by 1/1, manufacturers will receive a notice that their certificates are inactive along with procedures and fees associated with reactivating the CCs.

102-6 I NTETC Weighing, Measuring, and Belt-Conveyor Scale Sector Reports

The BOG received summaries of the decisions made at the National Type Evaluation Technical Committee (NTETC)Weighing Sector meeting on November 14 and 15, 1996, in Albany, NY, (see Appendix K) and the Measuring Sector meeting held in October 1996 in conjunction with the Southern Weights and Measures Association Annual Conference in Charleston, WV, (see Appendix L for an abbreviated summary; a more detailed summary is being developed and will be published later). The Belt-

Conveyor Sector also met in November 1996 in Albany; however, at the time of the 1997 Interim Meeting, the summary of decisions made at the meeting was being reviewed and was not yet available for distribution.

The next meeting of the Weighing and Belt-Conveyor Sectors will be in November 1997 in the Washington/Baltimore area, and the next meeting of the Measuring Sector will be in conjunction with the Western Weights and Measures Association meeting in September 1997.

102-7 I NTETC Grain Moisture Meter and Near-Infrared Protein Analyzer Sector Reports

A report of the progress of these Sectors was given at the Interim Meeting. See Appendices M and N for summaries of the September 1996 meetings of the Sectors.

102-8 V Certificate of Conformance Status: New Definition for "Effective" and Modifications to the Definitions for "Active" and "Inactive"

(This item was adopted.)

A proposal to add and modify definitions of terms used in the National Type Evaluation Program (NTEP) was received by the NTEP Board of Governors from NTEP administrators. The administrators had found some discrepancies between the terms used to designate the status of Certificates of Conformance (CCs) in NCWM Publication 5, NTEP Index of Device Evaluations, and NCWM Publication 14, Administrative Procedures, Technical Policy, Checklists, and Test Procedures. They concluded that neither document contains a complete definition for the terms in question; consequently, they are proposing changes to the definitions in both documents.

The proposal was reviewed by the members of the NTEP Board of Governors at the 1997 Interim Meeting, and a decision was made to make the proposal a voting item.

Recommendation:

Modify the definition for "Active Status" in NCWM Publication 14, Administrative Procedures, Technical Policy, Checklists, and Test Procedures, Section N, Status of Certificate of Conformance; Maintenance Fee, as follows:

2. Active Status

Devices are being manufactured or remanufactured for commercial applications under an NTEP Certificate of Conformance. This means that the Certificate is in force with a hard copy of the Certificate issued and distributed.

Add a new definition for "effective status" to Publication 14, Section N, as follows:

3. Effective Status

Equivalent to ACTIVE status, but a hard copy of the Certificate of Conformance has not yet been issued and distributed. Therefore, a hard copy of the Certificate is not yet included in Publication 5.

Renumber and modify the definition for "inactive status" in Publication 14, Section N, as follows:

~~3.~~4. **Inactive Status**

An Inactive Certificate of Conformance is a Certificate which was previously Active, but the ~~D~~devices are no longer being manufactured or remanufactured for commercial applications. However, devices already manufactured, installed, or in inventory, but not yet sold, may be used, sold, repaired, and resold, under an Inactive Certificate of Conformance.

Renumber the remaining paragraphs in Publication 14, Section N.

Modify the definitions in NCWM Publication 5, NTEP Index of Device Evaluations, so that they are consistent with the above definitions.

B. Bloch, California, Chairman

C. Gardner, Suffolk County, NY, Chairman of the NTEP Board of Governors
S. Malone, Nebraska, Chairman-Elect
J. A. Rogers, Virginia, Treasurer
B. Adams, Minnesota
C. Carroll, Massachusetts
M. Gray, Florida
R. Suiter, Nebraska
A. Thompson, Alaska
G. West, New Mexico

G. Ugiansky, NIST, Executive Secretary

Technical Advisors:
S. Roussy, Canada (Executive Committee only)
J. Koenig, NIST

Associate Member Representative:
R. Davis, James River Corporation (Executive Committee only)

Executive Committee

Appendix A
Strategic Planning Goals, Objectives, and Work Groups

Objectives for Goal I - Enhance the National Conference on Weights and Measures as a national and international resource for measurement standards development.

1. To develop a long term business plan for Conference operations.

   *Work Group Chairman: Aves Thompson, AK
   Group Members: Richard Davis, James River Corp.; Gary West, NM; J. Alan Rogers, VA; Gil Ugiansky, NIST

2. To develop a "business plan" for NTEP management.

   *Work Group Chairman: Dick Suiter, NE
   Group Members: Jim Truex, OH; Tina Butcher, NIST; Daryl Tonini, Scale Manufacturers Assn.; Gordon Johnson, Gasoline Pump Manufacturers Assn.; Bob Traettino, Meter Manufacturers Assn.

3. To establish a protocol for maintaining ongoing Congressional liaison.

   *Work Group Chairman: Tom Geiler, Barnstable, MA
   Group Members: (To be named)

4. To develop a plan for improving information dissemination.

5. To establish a protocol for NCWM responding to State and local legislative initiatives.

6. To establish a protocol for individual jurisdictions to approach their legislative bodies.

Objectives for Goal II - Provide uniform training programs for industry and government individuals involved in legal metrology.

7. To develop a training delivery plan in a 3-yr cycle.

   *Work Group Chairman: Max Gray, FL
   Group Members: Ed Price, TX; Tom Coleman, NIST

8. To develop a plan for increasing public awareness of NCWM through enhanced education and outreach.

Objectives for Goal III - Continue to develop new or alternative methods for improving delivery of weights and measures programs.

9. To establish benchmarks for minimum W&M program standards.

   *Work Group Chairman: Bruce Adams, MN
   Group Members: Charles Carroll, MA; Tom Geiler, Barnstable, MA; Georgia Harris, NIST

10. To assess the work of the Program Evaluation Work Group for expansion into a national database system.

    *Work Group Chairman: Steve Malone, NE
    Group Members: Darrell Guensler, CA; Gil Ugiansky, NIST

11. To solicit, identify, encourage, and evaluate the development of new or alternative methods for improving weights and measures programs.

Objectives for Goal IV - Continue to expand the Conference role in national and international legal metrology.

12. To develop a plan to evaluate and coordinate national surveys and inspections.

    *Work Group Chairman: Charles Gardner, Suffolk Co., NY
    Group Members: Tom Coleman, NIST

13. To develop a mechanism for responding to ongoing requests for assistance from other countries in establishing W&M programs consistent with U.S. practices.

Appendix B - Proposed Changes to the NCWM Constitution and Bylaws

Constitution

Article I - General

This Association shall be known as "The National Conference on Weights and Measures" and is sponsored by the National Institute of Standards and Technology (NIST) under the authority of that portion of the Organic Act (U.S. Code, Title 15, Chapter 7, Section 272) authorizing the NIST to undertake "cooperation with the States in securing uniformity in weights and measures laws and methods of inspection."

Article II - Objectives

The objectives of The National Conference on Weights and Measures are:

A. ***Forum***. To provide a national forum for the discussion of all questions related to weights and measures administration as carried on by officials of the Federal Government and regulatory officials of the States, Commonwealths, Territories, and Possessions of the United States, their political subdivisions, and the District of Columbia.

B. ***Mechanism***. To provide a mechanism to establish policy and coordinate activities within the Conference on matters of national and international significance pertaining to legal metrology.

C. ***Consensus***. To develop a consensus on uniform laws and regulations, specifications, and tolerances for weighing and measuring devices, and on testing, enforcement, and administrative procedures.

D. ***Uniformity***. To encourage and promote uniformity of requirements and methods among jurisdictions.

E. ***Cooperation***. To foster cooperation among regulatory officers themselves and between them and all of the many manufacturing, industrial, business, and consumer interests affected by their official activities.

Article III - Membership

Membership consists of three classes: active, advisory, and associate.

Active Membership. - ~~Active membership is limited to weights and measures or measurement officers actively engaged in regulatory service and~~ Applies to individuals in the employ of States, Commonwealths, Territories, or Possessions of the United States, their political subdivisions, or the District of Columbia who are actively engaged in the enforcement of weights and measures laws and regulations.

Advisory Membership. - ~~Advisory membership is open~~ Applies to: (1) representatives of agencies of the Federal Government, (2) representatives of State and local governments other than those involved in the enforcement of weights and measures ~~officials~~ laws and regulations, (3) foreign government officials, and (4) retired persons ~~who have retired from Federal, State, county, or city weights and measures employment who are concerned in any way with regulatory weights and measures officers or their official activities or~~ who are interested in the objectives and activities of the Conference and who participate as individuals rather than as representatives of a particular industry or interest group.
(Amended 1990)

Associate Membership. - ~~Associate membership comprises~~ Applies to representatives of manufacturers, industry, business, and consumers; and other persons who are interested in the objectives and activities of the Conference and who do not qualify as Active or Advisory members.

Article IV - Officers

Section 1 - Ex Officio Officers

A. ***President***. - The Director of the National Institute of Standards and Technology is, ex officio, the President of the Conference.

B. ***Executive Secretary***. - The Director of the National Institute of Standards and Technology designates a senior member of the Institute staff, who is thoroughly conversant with weights and measures nationally, to serve the Conference as its Executive Secretary.

Section 2 - Elective Officers

The Elective Officers of the Conference shall be:

Chairman-Elect,

Four Vice-Chairmen,

Treasurer, and

Six members-at-large to serve on the Executive Committee.

The consecutive reelection of a Chairman-Elect is prohibited; the Chairman-Elect shall not serve on any standing committee other than the Executive Committee. Should the Chairman-Elect for any reason be unable or unwilling to be installed as Chairman, his/her successor shall be elected in the manner prescribed. In this event, the newly elected Chairman-Elect shall be installed as Chairman.

A. **Eligibility**

1. Any active member in good standing shall be eligible to hold any office provided that the individual meets the other requirements set forth in the Constitution and Bylaws.

2. The Chairman-Elect will be elected at the Annual Meeting 1 year prior to the term of service as Conference Chairman. After serving 1 year as Chairman-Elect, the incumbent will succeed to the office of Conference Chairman.

B. **Nominations and Elections**

1. Nominating Committee

   a. Each year prior to the Conference's Interim Meeting, t~~T~~he Chairman shall appoint a Nominating Committee ~~consisting of the most recent active Past Chairman as Committee Chairman and six active members, to include at least one member representing each of the four Regions~~.

   (Amended 1986)

2. Nominations

   a. The Nominating Committee shall submit one name for each elective office and present its recommendation as a slate in its report to the Conference.

   b. Additional nominations for officers may be made from the floor at the Annual Meeting provided that prior consent of the nominee has been obtained in writing and presented to the presiding officer at the time of the nomination.

3. Elections

Officers shall be elected during a designated session of the Annual Meeting by a formal recorded vote of the members in attendance and eligible to vote on Conference motions.

See Bylaws, Article VI - Voting System

4. Terms of Office

   a. The Chairman, Chairman-Elect, Past Chairman, Vice Chairmen, and Treasurer, shall serve for a term of 1 year or until their successors are respectively elected or appointed and qualified.

   b. The six Executive Committee members-at-large shall serve for ~~3~~ 5-year terms; ~~two~~ one elected each year, except for every fifth year when two shall be elected.

   c. All officers shall take office immediately following the close of the Annual Meeting at which they were elected.

5. Filling Vacancies

In case of a vacancy in any of the elective offices, the ~~Executive Committee~~ Chairman (or, if the vacancy is for the Chairman's position, the Chairman of the National Type Evaluation Program Board of Governors) shall nominate a replacement, and that person shall be appointed to fill the office if a majority of the members of the Executive Committee approve the nomination ~~shall fill the office by appointment~~.

Article V - Appointive Officials

Section 1 - Officials, Specific

The Conference Chairman will annually appoint the following officials:

Chaplain

Parliamentarian

Assistant Treasurer

Two Sergeants-At-Arms

Section 2 - Officials, Other

A. **Appointment**

The Conference Chairman shall appoint other officials to conduct Conference activities. See Bylaws, Article IV - Duties of the Officers, and Article V - Committees.

B. **Assumption of Office**

All appointive officials shall take office immediately following appointment and will serve through the subsequent Annual Meeting of the Conference unless otherwise specified by the Conference Chairman.

Article VI - Meetings of the Conference

A. **Annual Meeting**

The Annual Meeting of members shall be held ~~each year~~ at the Annual Conference. The agenda for this meeting shall include the election of officers, reports from the various committees, task forces, study groups, and treasurer, and other items pertinent to the Conference.

The Annual Meeting may include the presentation of technical papers, discussions, displays, entertainment, or other events at the discretion of the Executive Committee.

B. **Interim Meetings**

The Interim Meetings of the Executive Committee and those Standing Committees designated by the Chairman shall be held annually, approximately 6 months prior to the Annual Meeting in order to develop the agenda and committee recommendations to be presented to and acted on by the membership at the Annual Meeting.

C. **Special Meetings**

1. The Conference Chairman is authorized to order a meeting of the Executive Committee at any time such a session is deemed by the Chairman to be in the best interests of the Conference.

2. Other Committees of the Conference are authorized to hold meetings at times other than the Annual Meeting or Interim Meeting provided that:

   a. such meeting or meetings have been provided for in the Conference budget approved by the Executive Committee, or

   b. such meeting or meetings are approved by the Chairman and funding is available within the approved budget, or

   c. such meeting or meetings are approved by the Chairman and the Executive Committee including agreement to increase the budget to cover the cost of the meeting.

3. A quorum shall consist of a majority of the eligible voters.

D. **Rules of Order**

The rules contained in Robert's Rules of Order shall govern the Conference in all cases to which they are applicable, and in which they are not inconsistent with the Constitution or Bylaws or the special rules of the Conference.

Article VII - Fees and Dues

The annual membership fees, registration fees for meetings, and the maintenance fees for the National Type Evaluation Program (NTEP) shall be established (and may be revised) by a majority vote of the Executive Committee at any official meeting of that Committee.
(Revised 1993)

Article VIII - Amendments to the Constitution

This Constitution may be amended, added to, or repealed at any Annual Meeting of the membership under normal Conference procedures. Proposed changes must be included in the Agenda of the Executive Committee for the Interim Meetings, published in the recommendations of the Executive Committee in its ~~Tentative~~ Interim Report (contained in the ~~Announcement Book of the~~ Program and Committee Reports for the Annual Meeting, NCWM Publication 16), and discussed at the ~~general session~~ open hearing of the Executive Committee at the Annual Meeting at which said changes will be voted on. Amendments to the Constitution must be approved by a minimum of a two-thirds vote in both the House of State Representatives and the House of Delegates.

Article IX - Bylaws

Section 1 - Supplementation of Constitution

This Constitution shall be supplemented by Bylaws which shall detail the methods of operation of the Conference. Such Bylaws shall not be inconsistent with the provisions of the Constitution.

Section 2 - Amendments, Additions, and Repeals of Bylaws

The Bylaws may be amended, added to, or repealed in the same manner as prescribed for the Constitution (See Article VIII).

Section 3 - Renumbering

The Executive Secretary is authorized to renumber the Articles and Sections of the Constitution or Bylaws to accommodate any changes made.

Bylaws

Article I - Application for Membership

Section 1 - Form of Application

Each application for membership in this Conference shall be in the form prescribed by the Executive Committee.

Section 2 - Submission of Application

~~Each~~ Aapplications for membership shall be submitted to the ~~Executive Secretary. The application shall be accompanied~~ Conference along with the appropriate ~~by the~~ membership fee. The membership will not be activated until the membership fee has been paid. ~~Applications received by the Executive Secretary will be processed. The new applicant's name will be added to the Conference membership mailing list.~~

Article II - Fees, Membership Records

Section 1 - Fee

The fee for annual membership, as well as the registration fees for the Interim and Annual Meetings, are established and subject to revision by the Executive Committee.

Section 2 - Membership Year

Annual membership shall be payable by July 1 of each year and covers the period July 1 to June 30 of the following year.

Section 3 - Billing

The Executive Secretary shall bill each member for yearly dues 2 months prior to the expiration of the current membership year.

Section 4 - Evidence of Membership

Membership certificates and cards of suitable design, bearing the seal of the Conference, shall be issued to members. The Executive Secretary shall advise the Treasurer of the count of new members and will forward the membership monies for deposit in the Conference account.

Section 5 - Waiver of Registration and Membership Fees

Individuals who have retired after 10 or more years of weights and measures employment in either the public or private sectors, and who have attended at least one Annual Meeting, shall not be subject to the payment of the registration and membership fees. The spouses of retired members shall enjoy the same privileges as spouses of active members.
(Added 1986; Amended 1987)

Article III - Use of the Insignia

The insignia of the Conference may be used or displayed only by members of the Conference, unless expressly authorized in writing by the Conference.

Article IV - Duties of the Officers and Appointive Officials

Section 1 - Chairman

The Conference Chairman is the principal presiding officer at the meetings of the Conference and of the Executive Committee, makes appointments to the several standing and ~~annual~~ special purpose committees, and appoints other Conference officials to serve during his or her term of office.

Section 2 - Chairman-Elect

The Chairman-Elect will:

A. serve as acting Conference Chairman in the event that the Chairman is unable to carry out the duties of that office,

B. perform other duties assigned by the Conference Chairman,

C. serve on the Executive Committee,

D. serve on the Budget Review Committee.

Section 3 - Vice Chairmen

The Conference Vice Chairmen preside over sessions of the meetings of the Conference as assigned by the Conference Chairman and assist the Chairman in the discharge of his or her duties.

Section 4 - Executive Secretary

The Executive Secretary acts as the executive officer of the Conference. ~~, the secretary and executive officer of the Executive Committee, and the non-voting secretary to each standing committee; handles~~ As such, he or she is responsible for all details in connection with the arrangements for and the programs of the meetings; ~~keeps the records~~ the editorial review and publication of the proceedings of the meetings and

other Conference publications; ~~manages~~ the administration and finances of the Conference ~~administration and finances as prescribed in its Administrative Procedures~~; and ~~certifies~~ certification to the Treasurer that ~~the correctness of~~ bills submitted to the Conference for payment are correct.

Section 5 - Treasurer

The Treasurer receives and accounts for all monies collected and pays all Conference bills certified by the Executive Secretary as correct.

Section 6 - Chaplain

The Chaplain performs the customary duties of that office.

Section 7 - Assistant Treasurer

The Assistant Treasurer shall assist the Treasurer in the discharge of his or her duties.

Section 8 - Parliamentarian

The Parliamentarian shall assist in assuring meetings of the Conference are conducted according to Robert's Rules of Order and any special rules adopted by the Conference.

Section 9 - Past Chairman

The most recent still-active Past Chairman will serve as: (1) Chairman of the Executive Committee when it sits as the Board of Governors for the National Type Evaluation Program and also as (2) Chairman of the Nominating Committee.
(Added 1991)

Section 10 - Sergeants-At-Arms

The Sergeants-At-Arms help preserve order during the public sessions of the Conference Annual Meeting. Their responsibilities include ensuring that only registered delegates are present and that individuals or groups appearing before the Conference are properly identified.

Article V - Committees

Section 1 - ~~Annual~~ Special Purpose Committees

The ~~Annual~~ Special Purpose Committees consist of the following:

A. **Nominating Committee.** The Nominating Committee shall be appointed annually and shall consist of ~~seven members~~ the most recent active Past Chairman of the Conference as Committee Chairman and six active members, to include at least one member representing each of the four regions.

B. **Resolutions Committee.** The Resolutions Committee shall consist of ~~seven~~ three members appointed for 3-year staggered terms.

C. **Auditing Committee.** The Auditing Committee shall consist of three members appointed for 3-year staggered terms.

D. **Associate Membership Committee.** The Associate Membership Committee shall consist of not less than five nor more than 10 members, appointed by the Conference Chairman from the associate membership. This Committee shall represent a cross-section of interests within the associate membership.

E. ~~**Finance**~~ **Budget Review Committee.** The ~~Finance~~ Budget Review Committee~~, which shall also serve as the Budget Review Committee,~~ shall consist of the NCWM Chairman, as Chairman of the Committee, and the Treasurer, Chairman-Elect, nominee for Chairman-Elect, and Executive Secretary as ex-officio voting members. In addition, the Chairman shall appoint ~~two Active and~~ two Associate members to serve on a rotating basis for 4-year terms.
(Amended 1995)

F. **Credentials Committee.** The Credentials Committee shall consist of three members all of whom are appointed by the Conference Chairman from the active membership, and shall consist of at least one member ~~each~~ from a State~~, county, and city~~ jurisdiction and one member from a city or county jurisdiction, serving on a rotating basis for 3-year terms (a new member appointed each year to replace the member whose term expires). The senior member serves as Committee Chairman.

Section 2 - Standing Committees

The standing committees are:

Executive Committee;
Committee on Specifications and Tolerances;
Committee on Laws and Regulations; and
Committee on Administration and Public Affairs~~;~~.
~~Finance Committee; and~~
~~Credentials Committee~~.
(Revised 1994, 1995)

A. **Membership** (other than Executive~~, Finance, and Credentials~~ Committees)

The membership of each of the standing committees ~~is a normal complement~~ consists of five members, at least one member from each of the four weights and measures regions, appointed by the Conference Chairman from the active membership on a rotating basis for 5-year terms, or until a successor is appointed. In addition, every fifth year the Conference Chairman shall appoint a nonvoting

Associate Member Representative (AMR) to the Committee on Laws and Regulations and Committee on Administration and Public Affairs. The AMR shall be nominated by the Associate Membership Committee and shall serve a 5-year term, or until a successor is appointed.

When it is necessary to make an appointment to any of the standing committees to fill a vacancy caused by the death, resignation, or retirement from active service by a committee member, the appointment is for the unexpired portion of the member's term.

Except as noted, each standing committee annually selects one of its members, preferably its senior member, to serve as its chairman.

~~At his or her option, the Chairman designates one or more advisory or associate members as consultants to a standing committee.~~

(Revised 1994)

B. **Executive Committee**

The Executive Committee consists of the President, Executive Secretary, the Conference Chairman, the Chairman-Elect, the most recent still active Past Chairman, the Treasurer, and six members elected at large from the active membership, the latter to serve ~~3~~5-year staggered terms. In addition, every fifth year the Conference Chairman shall appoint a nonvoting Associate Member Representative (AMR) to the Executive Committee (the AMR shall not be a member of the National Type Evaluation Program Board of Governors). The AMR shall be nominated by the Associate Membership Committee and shall serve a 5-year term, or until a successor is appointed.

The President and Executive Secretary do not have votes on matters before the Executive Committee.

Insofar as possible, the Nominating Committee, in recommending candidates for the Executive Committee, shall consider regional representation.

~~The term of the Executive Committee runs from the adjournment of the Annual Meeting at which its members are elected through the succeeding Annual Meeting of the Conference.~~

Section 3 - Special Committees, Subcommittees, Task Forces, and Study Groups

Special committees, task forces, and study groups are appointed by the Conference Chairman from the active, advisory, or associate membership, in any combination, as the need arises or the Conference requests.

~~**Section 4 - Subcommittees**~~

~~Upon recommendation of a committee, the Conference Chairman may appoint a subcommittee(s) to assist the committee in carrying out its responsibilities.~~

Section 5 4 - Duties and Fields of Operation of Committees

A. **Executive Committee**

The Executive Committee, subject to the overriding authority of the Conference itself:

1. selects the place, dates, and headquarters, and fixes the registration fee for each meeting of the Conference;

2. fixes the annual membership fee;

~~3. may, at its option, fill any vacancy in any elective office of the Conference caused by death, resignation, or retirement from active official regulatory service; and~~

~~4~~3. advises the Executive Secretary with respect to the programs for the meetings of the Conference and its committees, and makes recommendations to the Conference, the Conference officers, and the committee chairmen~~.~~; and

~~5~~4. fixes the annual maintenance fee for retaining a National Type Evaluation Program Certificate of Conformance. These fees will go solely for the NCWM support of the National Type Evaluation Program.

(Added 1993)

The Executive Committee, in the interval between meetings of the Conference:

1. authorizes Interim Meetings of Conference committees as needed;

2. authorizes committee and other contingent expenditures (including travel and subsistence expenses of committee members and the Conference Chairman), and

3. acts for the Conference in all routine or emergency situations that may arise.

~~Each newly constituted Executive Committee joins the new chairmen of standing committees in a breakfast meeting (as guests of the Conference) on the last day of the Conference, for general discussion and for transaction of business by the Executive Committee.~~

Questions before the Executive Committee are decided, whether by voice vote or ballot, on the basis of the majority of votes cast.

The Executive Committee:

1. serves as the Board of Governors for the National Type Evaluation Program (NTEP);

2. utilizes the technical committees of the NCWM to resolve technical issues regarding NTEP;

3. utilizes the industry members of the Technical Committee on National Type Evaluation~~, who will comprise the NTEP Advisory Committee and who will represent the interest of industry~~, in advising the Board of Governors.

The Committee serves as a policy and coordinating body in matters of national and international significance which may include such areas as metrication, International Organization of Legal Metrology (OIML), American National Standards Institute (ANSI), International Organization for Standardization (ISO), American Society for Testing and Materials (ASTM), National Conference of Standards Laboratories (NCSL), and such internal matters as may be required, including, for example, the Retiree Organization.
(Amended 1995)

The Committee annually presents a report ~~to the~~ for Conference ~~on its activities, which are subject to Conference ratification~~ action.

B. **Committee on Laws and Regulations**

The Committee on Laws and Regulations annually presents a report for Conference action.

Its scope embraces all matters within the area of weights and measures supervision including:

1. the development and interpretation of uniform laws and regulations;

2. the study and analysis of bills for legislative enactment; and

3. the establishment and maintenance of published guidelines and other effective means of encouraging uniformity of interpretation and application of weights and measures laws and regulations.

4. liaison with Federal agencies, State agencies, and other groups or organizations on issues within the purview of the Committee. This role entails explaining, advocating, and coordinating Conference positions, recommendations, and needs before Federal Government agencies, consumer groups, the associate NCWM membership, domestic and international standards organizations, industry, trade associations, and others. The goals are to provide and solicit information, develop a spirit of cooperation, and promote uniformity with the activities and standards of the NCWM.

C. **Committee on Specifications and Tolerances**

The Committee on Specifications and Tolerances annually presents a report for Conference action.

Its scope embraces all matters dealing with:

1. specifications, tolerances, and technical requirements of any kind relating to scales, weights, measures, and weighing and measuring devices and accessories, including interpretation of such material whenever necessary,

2. standards and testing equipment for weights and measures officials, and

3. procedures for testing commercial equipment.

4. liaison with Federal agencies, State agencies, and other groups or organizations on issues within the purview of the Committee. This role entails explaining, advocating, and coordinating Conference positions, recommendations, and needs before Federal Government agencies, consumer groups, the associate NCWM membership, domestic and international standards organizations, industry, trade associations, and others. The goals are to provide and solicit information, develop a spirit of cooperation, and promote uniformity with the activities and standards of the NCWM.

D. **Committee on Administration and Public Affairs**

The mission of the Committee is:

> To provide leadership to develop and implement uniform, quality weights and measures services in the areas of:
>
> - effective program management,
> - education, and
> - public relations.

The Committee on Administration and Public Affairs annually presents a report for Conference action.

Its scope embraces all matters dealing with:

1. development and recommendation of administrative procedures;

2. education and training of weights and measures officials;

3. promotion of weights and measures principles and techniques among users of weights and measures devices and the general public; and

4. liaison with Federal agencies, State agencies, and other groups and organizations on issues within the purview of the committee. This entails explaining, advocating, and

coordinating Conference positions, recommendations, and needs before Federal Government agencies, consumer groups, the Associate NCWM membership, domestic and international standards organizations, industry, trade associations, and others. The goals are to provide and solicit information, develop a spirit of cooperation, and promote uniformity with the activities and standards of the NCWM.
(Amended 1994, 1995)

E. **Nominating Committee**

The Nominating Committee annually presents a slate of nominees for all elective offices. The names of these nominees shall appear in the report of the Nominating Committee and be published in NCWM Publication 16, Program and Committee Reports.

F. **Resolutions Committee**

Each year at the Annual Meeting of the Conference, ~~T~~the Resolutions Committee ~~annually~~ presents for Conference action such resolutions as it has been directed by the Conference to prepare, and such additional resolutions as are deemed appropriate by the Committee.

G. **Auditing Committee**

The Auditing Committee annually audits the books of the Treasurer and reports its findings to the Conference.

H. **Credentials Committee**

The Credentials Committee administers the Conference voting system, makes decisions concerning disputed rights of designated representatives, and approves or certifies representatives to the House of State Representatives.

I. ~~**Finance**~~ **Budget Review Committee**

The ~~Finance~~ Budget Review Committee oversees the financial responsibilities of the Conference. ~~and~~ It annually reviews the budget of the Conference and develops a proposed budget for the next Conference fiscal year, which begins January 1 of the following year and runs through December 31. The proposed budget is submitted to the Executive Committee for approval at the Conference Annual Meeting along with any recommendations for changes in the handling of Conference finances. ~~serves as the Budget Review Committee~~.

J. **Associate Membership Committee**

The Associate Membership Committee annually reports on its activities and makes recommendations to the Executive Committee. The Committee provides coordination and participation of associate members in all business and social affairs of the Conference.

Article VI - Voting System

All questions before a meeting of the Conference that are to be decided by a formal recorded vote of the active members are voted on in accordance with the following voting structures and procedures.

Section 1 - House of State Representatives

A. **Official Designation**

This body of Active members who are officially designated by their States and are present and registered at the Annual Meeting ~~officials~~ shall be known as the "House of State Representatives."

B. **Composition**

Each State is authorized one official to serve as its representative at the Annual Meeting of the NCWM. The State weights and measures director, or his or her designee (State or local government official), is the State representative.

The District of Columbia, the Navajo Nation, and the U.S. Commonwealths and Territories that have weights and measures programs similar to those of the States (for example, have followed the uniform laws and regulations and have adopted Handbook 44) are also allowed representatives.

C. **Method of Designation**

Each representative is specified annually to the Credentials Committee 30 days before the NCWM Annual Meeting. Accommodation may be made for exceptions to this deadline. An alternate should be named prior to the NCWM Annual Meeting in case the designated representative cannot attend.

Section 2 - House of Delegates

A. **Designation**

All other ~~State and local weights and measures regulatory officials~~ Active members present and registered at the Annual Meeting (those not sitting in the House of State Representatives) are grouped as a body known as the "House of Delegates."

B. **Requirements**

No other special requirements apply.

Section 3 - Minimum Votes

A. **House of State Representatives**

A minimum of 27 votes in favor of, or 27 votes in opposition to, an issue must be cast for the vote to be considered official. If 54 or more votes are cast in the House of State Representatives, a majority of the total votes is required to pass (or defeat) the issue. (Amended 1992)

B. **House of Delegates**

A minimum of 27 votes in favor of, or 27 votes in opposition to, an issue must be cast for the vote to be considered official. If more than 54 total votes are cast, a simple majority rules. Should a tie vote occur, or if the minimum votes in support or opposition are not cast, the issue is decided by the vote of the House of State Representatives.
(Revised 1992)

Section 4 - Voting Rules

A. **Proxy Votes**

Proxy votes are not permitted. Since issues and recommendations in the committees' interim reports are often modified and amended at the Conference, the attendance of officials at the NCWM Annual Meeting and voting sessions is vital.

B. **Method**

All voting is by a show of hands, standing vote, or machine (electronic). There shall be no voice voting. No abstentions are ~~permitted~~ recorded.

C. **Timing**

Voting by both Houses is simultaneous.

D. **Recording**

The voting system is designed to record the votes of the State representatives whether an electronic system, show of hands, or standing vote is used.

E. **Applicability**

These procedures (rules) apply only to the plenary (general) sessions of the NCWM.

Section 5 - Committee Reports

Alternatives that may be used in voting on the reports:

A. vote on the entire report,

B. vote on grouped items or sections, or

C. vote on individual items; according to

1. committee discretion, or

2. on request by a voting delegate, with the support of 10 others.

Section 6 - Floor Amendments

A. **Amendments**

Committee chairmen are allowed to offer amendments on the day of voting to make editorial changes in their final reports.

B. **Changes**

Substantive changes can be made at the request of weights and measures officials only, and:

1. a majority of the voting delegates of each House must vote favorably before a proposed amendment can be accepted for debate.

2. A two-thirds favorable vote of each House on the amendment is required for passage (the requirement for a minimum vote of 27 in both Houses also applies).

Section 7 - Seating

A. **Arrangement**

The seating arrangement for voting sessions is shown on page 62 in Figure 1.

B. **Supervision**

The members of the Credentials Committee will count votes and control placement and movement of delegates.

Section 8 - Voting

At the conclusion of debate (if authorized) on a motion, there shall be a call for the vote by a show of hands, standing, or electronic count.

A. **Motion Accepted If:**
1. a minimum of 27 members of the House of State Representatives votes Yea.

And If

2. a majority of the members of the House of Delegates votes Yea (a minimum of 27 Yea votes required);[1]

B. **Motion Rejected If:**
1. a minimum of 27 members of the House of State Representatives votes Nay

And If

2. a majority of the members of the House of Delegates votes Nay (a minimum of 27 Nay votes required);[2]

C. **Split Vote:**

When the two Houses split on an issue or the minimum number of votes supporting or opposing an issue is not obtained in the House of State Representatives, the issue is returned to the standing committee for further consideration.

The committee may drop the issue or reconsider it for submission the following year. The issue cannot be recalled for another vote at the same Annual Meeting.

Section 9 - Procedures

The Conference officers and committees observe in all of their procedures the principles of due process -- the protection of the rights and interests of affected parties; specifically, they: (a) give reasonable advance notice of contemplated committee studies, items to be considered for committee action, and tentative or definite recommendations for Conference action, for the information of all parties at interest, and (b) provide that all interested parties have an opportunity to be heard by committees and by the Conference.

Section 10 - Changes in Organization and Procedure

Proposals for changes in organization or procedure of the Conference are not acted upon until the Annual Meeting of the Conference following the Annual Meeting at which such proposals are made.

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1. If the minimum number of votes required to pass or fail an issue is not cast in the House of Delegates, the issue will be determined by the vote of the House of State Representatives.

2. If the minimum number of votes required to pass or fail an issue is not cast in the House of Delegates, the issue will be determined by the vote of the House of State Representatives.

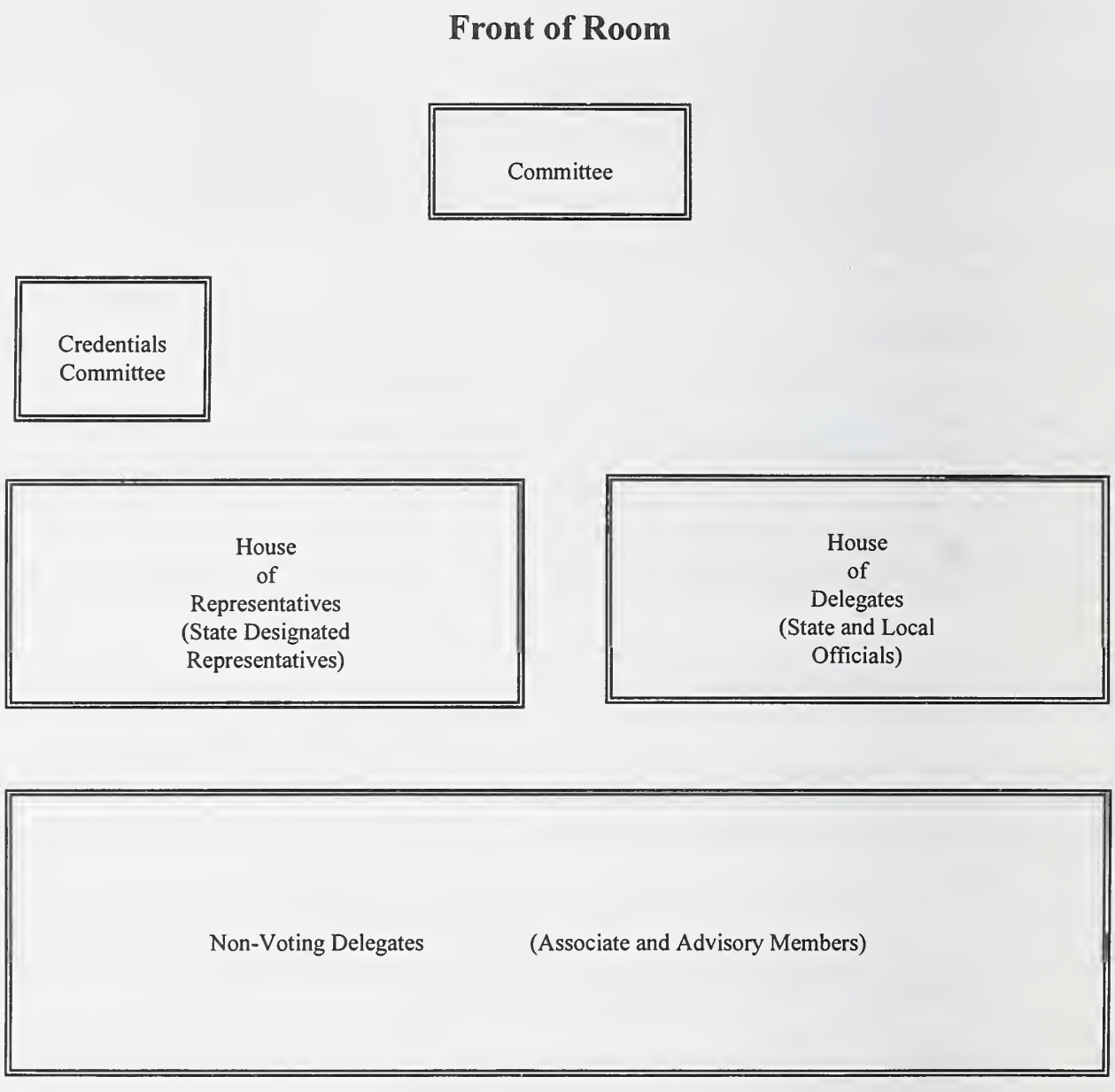

Figure 1. Seating Arrangement

Rationale for Major Changes
To the NCWM Constitution and Bylaws

Constitution

Article III - Membership

The definition of "Active Membership" was changed to make it clear that in States where responsibilities for the enforcement of weights and measures laws and regulations have been given to more than one organizational unit (for example, where a State has a petroleum program with responsibility for checking retail motor-fuel dispensers that is separate from the rest of the weights and measures program) individuals in both groups may be considered "Active Members" and may vote at the Conference's Annual Meeting.

The definition of "Advisory Membership" was changed to: 1) more clearly state that this category of membership is limited to State officials who do not have regulatory weights and measures responsibilities and 2) include all retirees, regardless of whether or not they have been weights and measures officials, in order to give them the benefit of lower membership fees (as long as they are participating as individuals and not as representatives of a specific interest group).

The definition of "Associate Membership" was changed to reflect the changes in the other categories of membership.

Article IV - Officers

Section 2 - Elective Officers

B. Nominations and Elections

1. Nominating Committee - The paragraph was changed to specify when the committee should be appointed. In addition, the information on the composition of the committee was moved to the Bylaws where other information of this type is provided.

4. Terms of Office - Paragraph b in this section was changed to specify a longer term for Executive Committee members. The proposed 5-year term is the same as the terms for members of the other Standing Committees. It was believed that a longer term would enable Committee members to gain a better understanding of the issues facing the Conference and would facilitate the Committee's strategic planning efforts.

5. Filling Vacancies - The paragraph was changed to specifically give the Chairman (or Chairman of the NTEP BOG) the responsibility of recommending individuals to fill vacancies in any of the elective offices, who would then have to be approved by the Executive Committee. This change more closely reflects current practice.

Article V - Appointive Officials

Section 1 Officials, Specific - The term "annually" was added to indicate the length of the term of the officials. Reference to the two Sergeants-At-Arms who are appointed each year was added to reflect current practice.

Article VIII - Amendments to the Constitution - The references in this paragraph were updated.

Bylaws

Article I - Application for Membership

Section 2 - Submission of Application - The paragraph was revised to reflect current practices.

Article II - Fees, Membership Records

Section 1 - Fee - The paragraph was changed to reflect that registration fees are now charged for participation in the Interim Meeting as well as the Annual Meeting.

Executive Committee

Article IV - Duties of the Officers - The title was changed to include "Appointive Officials" because the section addresses the duties of these officials as well as the duties of the Officers.

Section 1 - Chairman - The term "annual" was changed to "special purpose" to reflect changes being proposed to the Bylaws, Article V, Section 1 (see the rationale below).

Section 2 - Chairman-Elect - See the rationale for the change to Article V, Section 1, E, Budget Review Committee.

Section 4 - Executive Secretary - This section was revised to more accurately reflect the responsibilities of this position.

Section 10 - Sergeants-At-Arms - If the proposal to add the Sergeants-At-Arms to the list of appointive officials in the Constitution is adopted, a paragraph such as this would be needed in the Bylaws to explain the duties of the position.

Article V - Committees

Section 1- Annual Committees - The members of the committees listed in this section used to be appointed annually to serve 1-year terms. In some cases, committee members are now appointed to 3-year terms; therefore, the title was changed because it is no longer accurate.

A. Nominating Committee - Information on the composition of the Nominating Committee was moved from the Constitution to the Bylaws because that is where similar information for the other committees of the Conference is found. The information on the term of the committee members was added for clarity.

B. Resolutions Committee - It was felt that the duties of this committee could be carried out by a smaller number of individuals. The information on terms was added to reflect current practice.

C. Auditing Committee - The information on terms was added to reflect current practice.

E. Budget Review Committee - This paragraph was moved from the section on Standing Committees to this section because the Budget Review Committee (BRC) is more appropriately classified as a "special purpose committee" than a "standing committee." The change of the Conference fiscal year to a calendar year has resulted in a situation where decisions made by the BRC on a budget for any particular year impact the terms of two Conference chairmen not just one. Traditionally, the BRC meets in the spring of the each year to develop the budget for the next fiscal/calendar year which begins January 1 of the following year. The current NCWM Chairman serves as the Chairman of the BRC; however, that individual leaves office before the budget that he or she helps develop actually goes into effect. Theoretically, that means that an incoming Chairman has only a limited opportunity to influence the budget that he or she will have to follow. Recently, the Chairman-Elect has been invited to attend the BRC meeting as an active, but unofficial participant. Consequently, he or she has had an opportunity to participate in the debate on the budget for at least the last half of his or her term. If both the Chairman-Elect and the individual nominated in January to become Chairman-Elect at the July Annual Meeting were members of the BRC, they would have the opportunity to directly participate in the development of both of the budgets that would be in effect during their term. Therefore, the BRC recommended that they both be added to the official list of BRC members in the NCWM Bylaws as ex-officio voting members. They also recommended that the name of the Committee be changed from "Finance Committee" to "Budget Review Committee" because the name better reflects the responsibilities of the committee and the term "Finance Committee" is no longer used.

F. Credentials Committee - This paragraph was moved from the section on Standing Committees to this section because the Credentials Committee is more appropriately classified as a "special purpose committee" than a "standing committee." As the number of city jurisdictions has decreased, it has become increasingly difficult to find individuals from these jurisdictions who are able to serve on the committee; consequently, the wording in this paragraph was changed to require at least one representative from a State jurisdiction and one from either a city or county jurisdiction to ensure representation of local groups but not mandate that one of the representatives be from a city jurisdiction.

Section 2 - Standing Committees - The Finance (Budget Review) Committee and the Credentials Committee were moved from this section because they are more accurately classified as "special purpose committees" rather than as "standing committees."

A. Membership - The paragraph was revised to reflect the current practice of requiring at least one member from each of the four weights and measures regions. In addition, wording was added to establish the Associate Member Representatives as permanent members of the Committee on Laws and Regulations and the Committee on Administration and Public Affairs. The last sentence

was deleted because Section 1 of Article IV of the Bylaws already gives the Conference Chairman broad authority to make appointments to the Standing Committees.

B. Executive Committee - The length of term for Executive Committee members-at-large was changed from 3 to 5 years to be consistent with the proposed change in Article IV, Section 2, Paragraph A, Number 4 b of the Constitution. Wording was added to establish the Associate Member Representative as a permanent member of the Executive Committee. The last sentence was deleted because it implies that the term of Executive Committee members is only 1 year.

Sections 3 & 4 - The scope of Section 3 was expanded to include "Subcommittees" and Section 4 was deleted because it was no longer necessary. Section 5 was renumbered as Section 4.

Section 5 - Duties and Fields of Operation of Committees

A. Executive Committee - Paragraph 3 was deleted because the procedures for filling vacancies on the Executive Committee is addressed in the Constitution. The following paragraphs were renumbered. The paragraph concerning the breakfast meeting for the Executive Committee and new Standing Committee chairmen was deleted because it does not reflect current practice (recent meetings of this type have been luncheon meetings) and it was felt that there was no longer any need to include such wording in the Bylaws. The reference to the "NTEP Advisory Committee" was deleted to be consistent with changes to NCWM Publication 14, NTEP Administrative Procedures, that were adopted by the 81st NCWM (See Item 102-6 in the Executive Committee's 1996 Report). The wording of the last sentence of this section was changed so that it would be consistent with similar wording in the sections on the other Standing Committees.

F. Resolutions Committee - The first paragraph was changed to be more specific about when the Committee presents its report.

I. Budget Review Committee - The paragraph was expanded to better describe the current responsibilities of the committee.

Article VI - Voting System

Section 1 - House of State Representatives

A. Official Designation - This paragraph was changed to make it clear that State Representatives must be Active members of the Conference and must be present and registered at the Annual Meeting in order to vote.

B. Composition - Reference to "the Navajo Nation" was added because they also are allowed to have a representative in the House of State Representatives.

Section 2 - House of Delegates

A. Designation - This was changed to make it clear that any Active members (see the proposed revision of the definition of "Active Membership" in the Constitution) (e.g., petroleum officials as well as weights and measures officials) who are present and registered at the Annual Meeting may vote as part of the House of Delegates.

Section 4 - Voting Rules

B. Method - The word "recorded" was substituted for "permitted" because it more accurately reflects current practice.

Policies

In 1995 the Executive Committee discussed the fact that there were policies adopted by the Conference for the operation of the NCWM that were not included in the Constitution and Bylaws. These policies appeared in the Conference Reports for the year they were adopted and some of them appeared in NCWM Publication 3, NCWM Policy, Interpretations, and Guidelines, which has not been updated since the portions of the document dealing with laws and regulations were added to NIST Handbook 130, Uniform Laws and Regulations. The Committee felt it would be desirable to have all of these policies included in one document along with the Constitution and Bylaws. Consequently, the Conference Reports from the last 10 years were reviewed and the policies dealing with the operation of the Conference were identified for possible inclusion in Publication 1 as a new section. The proposed Policies section, along with some suggested changes, is being published for information and comment at this time. It is not being proposed for adoption by the Conference.

Appendix C - Proposed New Section on Policies for the NCWM Constitution and Bylaws

Policies

Introduction

The following policies adopted by the NCWM membership were selected for inclusion in this document because they relate to the operation of the National Conference on Weights and Measures.

1.1. Special Recognition and Awards (Exec, 1986, p. 52) - ~~Active and Associate Members having~~ Individuals who have 10 or more years of membership in the NCWM, and who have rendered special service to the NCWM, may, at the time of their retirement from active weights and measures employment, be selected by the Executive Committee to receive an inscribed plaque attesting to that special service. The plaque will be presented by the Chairman or designee at the appropriate time and place.

Recommendations for this award may be made by (1) any member of the Conference, or (2) the Regional Associations through their Chairmen. Recommendations should be in writing and addressed to the Executive Committee.

1.2. International Organization of Legal Metrology, NCWM Participation (Exec, 1987, p.70; 1988, p. 54; 1989, p. 46)

PART I - GENERAL

A. It is the policy of the National Conference on Weights and Measures (NCWM) to participate in U.S. activities related to the International Organization of Legal Metrology (OIML).

B. NCWM participation in U.S. activities is viewed as an opportunity to introduce U.S. practices into international weights and measures requirements and also to enrich the U.S. system through adoption of international weights and measures practices.

C. The NCWM is the principal organization through which the recommendations of the OIML can be introduced into State weights and measures laws and regulations in the United States.

D. The Executive Committee will review the OIML Working Program and decide which Pilot and Reporting Secretariats are of interest to the NCWM, and will promote participation of its members on the various U.S. National Working Groups (USNWGs) overseeing these secretariats.

E. The Executive Committee will submit the name of the individual serving as the NCWM Chairman at the time of the Quadrennial OIML meeting to the Head of the U.S. Delegation as its nominee to represent the NCWM at the Quadrennial Meeting. If the Chairman is unable to represent the NCWM, the name of the Chairman-Elect will be submitted as its nominee.

PART II - NCWM REVIEW OF OIML RECOMMENDATIONS AND DOCUMENTS

PARTICIPATION ON OIML COMMITTEES

A. This part of the policy applies to selection of NCWM members for OIML Pilot and Reporting Secretariats and the USNWGs overseeing these Secretariats.

B. The Executive Committee will decide which Pilot and Reporting Secretariats are of interest to the NCWM and will promote participation of its members on the various USNWGs overseeing these secretariats.

C. The NCWM Chairman and Executive Secretary shall jointly receive and coordinate invitations or requests for NCWM participation in these OIML activities.

D. Members selected for participation in the meetings of the OIML activities should be qualified to represent the NCWM to ensure close coordination of the work and scope of the NCWM committees and of the OIML organizations.

E. Selection of NCWM members for participation will be determined as follows:

1. Requests will normally be referred to the appropriate NCWM Committee, in which case, the Committee will recommend to the Chairman by letter the NCWM member believed to be fully qualified. The Chairman may exercise the right to make the selection without reference to a Committee if the subject matter is not covered by the standing committee.

2. The NCWM Chairman, in consultation with the Executive Secretary, shall make the final NCWM selection and forward the name of the nominee to the NIST ~~Office of Standards Management.~~ Technical Standards Activities Program.

F. The role of the NCWM representative is of special significance in that he or she may be the first NCWM member having knowledge of the recommendations being developed. As the NCWM representative, the member:

1. will keep the sponsoring standing committee current on the progress of the OIML activity; and

2. will promote the policies of the NCWM, seeking guidance through the Committee structure if a question arises regarding the policy and/or position of the NCWM.

PART III - DEVELOPMENT OF NCWM POSITIONS

A. Formal processes are followed by the NCWM to review OIML Recommendations and Documents, leading to and including the development of official NCWM positions on these papers and the forwarding of these positions to the U.S. Representative to OIML.

B. Recommendations and documents will be reviewed to determine if the draft material is equivalent to existing NCWM codes, uniform laws and regulations.

C. The NCWM Chairman and Executive Secretary or shall jointly receive and coordinate requests for review of draft OIML International Recommendations and Documents which are to come before the International Committee of Legal Metrology (CIML) and the International Conference as follows:

1. The requests will be referred to the appropriate NCWM Committee for review and development of recommended NCWM position for submission to the Executive Committee. (The Executive Committee may decide to solicit comments from other members of the NCWM through use of the mail ballot.)

2. The Executive Committee will review the comments received and will formulate a recommended NCWM position on the OIML draft.

3. An affirmative position will be taken if the reviewers agree that the OIML draft is sufficiently beneficial and one of the following circumstances is met (otherwise, a negative position will be taken):

a. The proposed OIML requirements are considered to be equivalent to existing or proposed NCWM codes, ~~and~~ uniform regulations, and/or laws;

b. Conflicts with existing or proposed NCWM codes, uniform regulations, and/or laws can be resolved without difficulty or losing equivalence; or

c. No NCWM codes or uniform regulations exist and the draft OIML requirements could be considered as the basis for such codes or regulations.

4. The NCWM will consider abstaining if the draft is considered to be outside the scope of the NCWM interests or if a NCWM position on the draft can not be achieved.

PART IV- ADOPTION OF OIML RECOMMENDATIONS

A. Any OIML recommendation under consideration for adoption may be considered in whole or in part, or rejected. (NOTE: NCWM requirements may be less stringent and/or different from OIML requirements as long as they do not present a technical obstacle to the marketing of equipment in the United States.)

B. The OIML recommendation, or part thereof, may be proposed for adoption by the NCWM provided that:

1. it was not opposed by the NCWM;

2. a need exists;

3. the OIML recommendation satisfies the need; and

4. it is considered beneficial to the U.S. marketplace.

PART V - FUNDING

A. The NCWM will annually budget to support OIML activities. The amount of funding will be determined within the context of overall NCWM activities and will likely vary from year to year.

B. The representatives will be encouraged to arrange funding, either in full or partially, by their employer for their participation.

1.3. Policy, Members' Expenses (Exec, 1991, p. 59)

Section 1 - Introduction

1.1. Background - As a legal metrology standards-developing organization, the NCWM provides essential support to the various State and local weights and measures jurisdictions, developing its products largely through the attendance and participation of its active members, advisory members, and associate members at a wide range of meeting, conferences, and related forums.

1.2. Purpose - It is the purpose of this policy to establish a fair and equitable procedure for the reimbursement of travel expenses for Conference members when on authorized Conference business. Any traveler on official business is expected to exercise the same care in incurring expenses that a prudent person would exercise if traveling on personal business and expending personal funds. Excess costs, circuitous routes, delays, or luxury accommodations and services unnecessary or unjustified in the performance of official business are not acceptable under this policy.

It is the intent of this policy to make the NCWM the "reimburser of last resort." NCWM reimbursement is to be requested only after it has been determined the traveler's organization can not reimburse the traveler fully or partially.

1.3. Persons Covered - This policy applies to NCWM Active Members, Associate Members, and Advisory Members, and not to non-members, invited observers, Federal agency personnel, or Conference guests including speakers.

1.4. Annual Meeting - Attendance at the NCWM's Annual Conference is not a Conference reimbursable expense.

Section 2 - Definitions

2.1. Traveler - means any person authorized to be reimbursed.

2.2. Official Station - means the site (providing the lesser cost to the Conference)

1) at which a traveler is normally assigned by his/her employer, or

2) which is officially recognized as the domicile of the traveler.

2.3. Per Diem - means subsistence (meals and/or lodging) reimbursement for a 24-hour period beginning with the traveler's time of departure.

2.4. Transportation Expenses - means:

a) commercial carrier fares;
b) taxi, bus, van, airport limousine, or necessary rental car charges*;
c) private car mileage allowance;
d) parking, garage, and toll charges;
e) other charges essential to the traveler while en route; and
f) taxes for any of the above.

*Rental cars are not an approved expense unless authorized by the NCWM Treasurer in advance of travel.

Section 3 - Levels of Reimbursement

3.1. Full Reimbursement - Reimbursement is available for any authorized travel when the traveler's parent organization cannot provide funding.

3.2. Partial Reimbursement - Partial reimbursement is available when the traveler's parent organization partially funds the travel expenses.

Section 4 - Reimbursement Rates

4.1. Per Diem Expenses

4.1.1. Meals - except as stated in section 4.1.3., the NCWM's meal per diem shall be that rate authorized by NIST for its employees' meals. For a portion of a day, dinner shall constitute 50 percent and breakfast and lunch 25 percent each. Actual meal expenses (documented by receipts) may be authorized when necessary by the NCWM Executive Secretary and NCWM Chairman.

4.1.2. Lodging Expense - except as provided in section 4.1.3., expenses shall be reimbursed at no more than the minimum rate at the meeting site hotel except when otherwise authorized in writing.

4.1.3. Lodging and Meals at an Interim Meeting -

a) When an authorized traveler shares a room, the NCWM will reimburse the traveler the cost of the room at the minimum single room rate plus up to 100 percent of the traveler's meal per diem allowance.

b) When an authorized traveler occupies a single room, the NCWM will reimburse the traveler the cost of the room at the minimum single room rate plus up to 60 percent of the traveler's meal per diem allowance.

4.2. Transportation Expenses

4.2.1. Airline travel shall be reimbursed at the most economical coach class (including economy or excursion or Saturday fare) rate practical. Travelers shall utilize advance purchase discounts.

4.2.2. Rental cars when authorized shall be reimbursed at the subcompact or compact rate.

4.2.3. Private car mileage reimbursement shall be the current NIST reimbursement rate, but not to exceed the round trip airfare, as provided in section 4.2.1., from the traveler's official station.

4.2.4. Taxis, limos, shuttles, and other ground transportation shall be reimbursed at the most economical rate.

4.2.5. Airport parking shall be reimbursed at the most economical rate (i.e., satellite parking).

Section 5 - Travel Authorization

5.1. Domestic Travel (within USA) - Travel to be reimbursed fully or partially from NCWM sources must be authorized in writing (in advance of the travel commencing) by the Executive Secretary and the NCWM Chairman or NCWM Chairman-Elect.

5.2. International Travel - An international traveler must have been selected according to Conference international meeting selection procedures. NCWM will reimburse a traveler to locations outside of the United States. Such travel shall be undertaken only with advanced written authorization from the NCWM Executive Secretary and with the concurrence of the NCWM Chairman.

Section 6 - Vouchers

6.1. Authorized Forms - Requests for reimbursement of travel expenses shall be made on an NCWM Travel Voucher. NCWM will provide a copy of this form, along with a summary of this policy to each traveler at the time such travel is authorized.

6.2. Receipts - Receipts for common carrier, lodging, and other expenses as required must accompany submitted travel vouchers.

6.3. Certification - NCWM Travel Vouchers shall include the traveler's signature attesting the information is correct and that no other reimbursement has been or will be provided by any other source.

Section 7 - Exceptions

7.1. Exceptions - The NCWM Chairman may grant exceptions to this policy for good cause on a case by case basis.

1.4. Meetings, Annual and Interim, Work Schedule (Exec, 1991, p. 43)

- All sessions of Conference meetings are normally open to all members of the Conference. If the Chairman of a Committee recognizes an abnormal situation involving a proprietary issue (e.g., NTEP appeals) or sensitive issue or other substantive need, that portion of the session dealing with the abnormal issue may be closed provided that: (1) the Conference Chairman (or, in his or her absence, the Chairman-Elect) approves, and (2) an announcement of the closed meeting is posted on or near the door to the meeting session and on the announcement board at the registration desk. If at all possible, the posting should be done at least a day prior to the planned closed session.

1.5. Procedures for Establishing the Budget and Administering Funds of the NCWM (Exec, 1983, p. 77; 1985, p. 39; 1992, p. 64)

Purpose: To assure sufficient and accurately accounted funds for completion of objectives and activities, prioritized to attain the benefits desired by the National Conference on Weights and Measures (NCWM).

Policy:

(I) ESTABLISHING PRIORITIES

(A) A general set of priorities shall be established periodically, annually at least, by the NCWM policy establishing group, called the "Executive Committee," presided over by the Conference Chairman.

(II) BUDGET

(A) The Conference Chairman shall establish ~~within 60 days after the Annual Meeting~~ a Budget Review Committee constituted as prescribed in the NCWM Bylaws ~~(also called the Finance Committee)~~ which shall:

~~(1) be presided over by the Conference Chairman;~~

~~(2) consist of two weights and measures officials as appointed voting members,† one associate member as an appointed advisory non-voting member, the Treasurer as an ex-officio voting member, and the Executive Secretary as an ex-officio voting member;~~

~~Note 1: Terms for initially appointed voting members shall consist of 1 year for one member and 2 years for the other member with subsequent annual appointment of one member for a 2-year term.~~

~~(3) make necessary adjustments to the Executive Secretary's proposal (see (II)(B)) by deliberation through the use of correspondence, meetings, and/or conference calls.~~

(1) Develop a tentative budget for the following fiscal year[1] to include:

(a) Anticipated sources and quantities of revenue.

(b) Recommended ordinary and extraordinary expenditures to be funded from the anticipated budget.

(c) Prior year's estimated and final expenditures.

(d) Types of investments recommended for excess funds. [2]

(e) Anticipated need to draw on reserve funds or abilities to provide additional funds to any existing reserve fund.

(f) Recommended dues and registration fee levels.

Note [1]: The fiscal year for the NCWM is from January 1 through December 31.
Note [2]: Invested funds shall be Federally insured.

(2) Present a tentative budget at the Annual Meeting to the Executive Committee for acceptance. The Executive Committee may return the tentative budget to the Budget Review Committee for adjustment(s) to enable acceptance by the Executive Committee. Normally, these adjustments are expected to be

completed prior to conclusion of the Annual Meeting.

~~(B) The NCWM Executive Secretary shall, within 120 days[2] after the Interim Meeting, propose a tentative budget for the following fiscal year[3] to include:~~

~~(1) Anticipated sources and quantities of revenue.~~

~~(2) Recommended ordinary and extraordinary expenditures to be funded from the anticipated budget.~~

~~(3) Prior year's estimated and final expenditures.~~

~~(4) Types of investments recommended for excess funds.[4]~~

~~Note 2: To permit study of the Treasurer's first quarter report.~~
~~Note 3: The fiscal year for the NCWM is from January 1 through December 31.~~
~~Note 4: Invested funds shall be Federally insured.~~

~~(5) Anticipated need to draw on reserve funds or abilities to provide additional funds to any existing reserve fund.~~

~~(6) Recommended dues and registration fee levels.~~

~~(C) The proposed tentative budget submitted by the Executive Secretary within 120 days after the Interim Meeting to the Conference Budget Review Committee, as described in (II)(A) and (II)(B), shall use the same account receipts and expenditures categories as described in (IV)(A).~~

(III) AUTHORITY

(A) Acceptance by the Executive Committee of the Budget Review Committee's tentative budget constitutes acceptance for the Conference.

(IV) ACCOUNTING

(A) See Chart of Accounts in the Report of the 76th NCWM, 1991, Executive Committee Report, page 62.

(V) PROCESSING PAYMENTS

(A) A bill or invoice submitted for payment shall be processed as follows:

(1) It shall be certified by the Executive Secretary to be properly payable.

(2) The Executive Secretary shall retain a copy of the certified bill or invoice for his or her files, send a copy to the Chairman for information, and send the original to the Treasurer for payment.

(3) The Treasurer shall identify each certified bill or invoice with the number of the check issued.

(4) The Treasurer shall issue, sign, and send the check to the Executive Secretary for countersigning and mailing to the issuer of the bill or invoice.

(B) A file of all bills and invoices paid in both the current and preceding fiscal years and the Treasurer's current interim and last annual reports, preferably placed in a loose-leaf binder, shall be made available to the Chairman and Executive Committee at the Interim Meetings and at the Annual Meeting for review.

(VI) TREASURER'S REPORT

(A) The Conference Treasurer shall issue an interim and annual report of receipts and expenditures. The annual report shall be presented to the Conference membership.

(VII) AUDIT

(A) An annual Auditing Committee shall:

(1) Be appointed by the Conference Chairman ~~within 60 days after the annual meeting~~ prior to the NCWM Interim Meeting.

(2) ~~Consist of two members who served the previous year and one new member. One member is to be appointed chairman.~~ Be constituted as prescribed in the NCWM Bylaws.

(3) Conduct an audit and review of accounts to assure funds are received and disbursed in accordance with these procedures. ~~(It is recommended that the concluding audit be conducted within the first 2 days of the Annual Meeting so questions can be resolved.)~~

(4) Issue a statement of findings in a committee report at the time of the Annual Meeting.

1.6. Guideline - Site Selection Criteria (Exec, 1989, p. 39) - The following criteria are provided for selection of cities and hotels for the Annual Meeting of the NCWM held in July:

1. Large full-service hotel (500 rooms), minimum AAA 4-diamond or Mobil 4-star rating, with complete meeting room facilities, i.e.,

   a. General Sessions set for 400 classroom style with head podium for 12.

b. Seven (7) breakout rooms for simultaneous meetings throughout the week.

c. Four (4) additional breakout rooms for meetings simultaneous with those required under paragraph 1.b. above.

2. Active and supportive Convention Bureau.

3. Location safe for walking in the evening and with ample restaurants.

4. Several printing firms, within three or four blocks from the hotel, that will operate all night.

5. A variety of optional events and outings to choose from.

6. Full-service airport for connections from all 50 States (small connector airlines not desirable). Transportation to and from the airport should be ample, either from host hotel or airport transportation system.

1.7. U.S. /Canada Mutual Recognition Agreement (Exec, 1994, p. 39)

1. Purpose - The Purpose of this Mutual Recognition Agreement (MRA) is to set out a working relationship to implement applicable provisions of the Free Trade Agreement (FTA) by providing for the mutual recognition of the device evaluations administered and performed by ~~the Legal Metrology Branch (LMB)~~ Measurement Canada (MC), an agency of Industry ~~and Science~~ Canada, and by the National Type Evaluation Program (NTEP) of the National Conference on Weights and Measures (NCWM) of the United States.

2. Background - The Government of the United States of America and the government of Canada are parties to the FTA. Chapter Six of the FTA applies to technical standards, and Article 604 of this agreement provides in part 1 that:

To the greatest extent possible, and taking into account international standardization activities, each party shall make compatible its standards related measures and procedures for product approval with those of the other party.

~~The LMB~~ MC and NTEP operate ongoing type evaluation systems for commercial measuring devices. Canada, many States, and several U.S. Federal agencies require the evaluation and approval of the design and performance of device prototypes prior to their sale for commercial use.

Rather than submitting commercial devices for the United States market to NTEP laboratories and essentially the same devices for the Canadian market to ~~LMB~~MC's laboratory, manufacturers requested that the United States and Canada (1) combine their evaluation tests and (2) recognize either NTEP laboratory or LMB laboratory results of the combined evaluation as the basis upon which NTEP and ~~LMB~~ MC would each issue their evaluation documents (either the NTEP Certificate of Conformance or the Canadian Notice of Approval). Expected benefits include: increased uniformity of test methods reducing unnecessary differences, misunderstandings, and unnecessary duplication; reduced costs and improved turn-around time by accessing a single source for type evaluation for both nations; increased competitiveness for both U.S. and Canadian manufacturers by speeding the time from design to the end markets.

The following policy was adopted in January 1993 by the National Conference on Weights and Measures, in concert with Measurement Canada (formerly called the Legal Metrology Branch)~~, Canada~~:

With respect to weights and measures devices, the parties agree that the most effective means to remove barriers to free trade is to achieve mutual recognition of device type evaluation testing. This will necessarily involve the comparative analysis of type evaluation codes and test procedures together with the intent of streamlining and minimizing differences in so far as possible so as to enable efficient device evaluation while preserving the technical capability and competence of their mutual laboratories.

3. Agreement - The United States National Type Evaluation Program (NTEP) and ~~Canada's Legal Metrology Branch (LMB)~~ Measurement Canada (MC) agree to recognize each other's type evaluation results:

- NTEP will recognize the results of the tests performed by ~~the LMB~~ MC for the purpose of issuing NTEP Certificates of Conformance for the device types set out in the annex to this agreement. ~~LMB~~ MC will recognize the results of the tests conducted by the NTEP Participating Laboratories for the purpose of issuing a Canadian Notice of Approval for the device types set out in the annex to this agreement.

Each party will continue to issue its own document (either the NTEP Certificate of Conformance or the Canadian Notice of Approval).

Each party will

- make all information available to the other party, maintaining confidentiality of proprietary information;

- collaborate in the development of additional areas of mutual recognition;

- collaborate in the development of requirements and test methods for commercial devices and systems;

- collaborate in the development and maintenance of proficiency and uniformity of evaluation;

collaborate to preserve the technical capability and competence of their mutual laboratories.

4. Collaboration - Both parties will collaborate to eliminate or minimize differences in requirements and test methods so as to enable efficient device evaluation.

5. Resolution of Complaints - This MRA does not create obligations binding under international law. However, each party will investigate complaints that the other party brings forward, and both parties will work together to seek satisfactory resolution of such complaints.

6. Duration and Termination - This MRA will become effective on April 1, 1994. It will remain in effect for a period of five (5) years and may be extended by mutual consent. This MRA may be terminated at any time by either party upon six (6) months written notice to the other party.

7. Application for Type Approval - Under this agreement, any applicant for type approval is free to apply to either country when requesting type approval in either Canada, the United States, or both countries.

Mutual Recognition Agreement

ANNEX

List of device types that are subject to provision of the Mutual Recognition Agreement.

~~1. Electronic noncomputing bench and platform scales or separate weighing elements with a capacity up to and including 500 kilograms.~~

~~2. Electronic indicators for use with weigh scales.~~

(Copies of the current list of devices covered under the agreement are available from the NIST Office of Weights and Measures.)

Appendix D

Bylaws of the Associate Membership Committee of the National Conference on Weights and Measures

ARTICLE I: Name and Relationship to the National Conference on Weights and Measures

The name of this Committee is the Associate Membership Committee (Committee), an unincorporated committee representing the associate membership of the National Conference on Weights and Measures (NCWM) organized and existing pursuant to the Constitution and Bylaws of the NCWM (NCWM Publication 1). The associate membership of the NCWM comprises representatives of manufacturers, industry, business, consumers, and other persons who are interested in the objectives and activities of the NCWM. The NCWM is sponsored by the National Institute of Standards and Technology (NIST).

ARTICLE II: Members of Committee

The Committee shall consist of not less than 5 nor more than 10 associate members of the NCWM nominated and elected by the associate members in attendance at the Annual Meeting of the associate membership and appointed by the NCWM Chairman. The Committee shall strive to be representative of the cross-section of interests within the associate membership. The Associate Membership Committee Chairman shall provide the list of elected members to the NCWM Chairman for appointment.

ARTICLE III: Objectives and Responsibilities

The following are, without limitation, the objectives and responsibilities of the Committee:

(a) to explain, advocate and coordinate associate membership positions, recommendations, concerns and needs as they relate to issues of interest before the NCWM;

(b) to serve as a mechanism for dissemination of general and administrative information of interest to the associate membership, including advising associate members with respect to the programs for meetings of the NCWM and its Committees;

(c) to encourage the associate membership to participate in and otherwise assist in weights and measures conferences, meetings, seminars, training programs;

(d) to recommend one or more associate members as representatives to the standing committees of the NCWM and, when deemed appropriate, such other committees of the NCWM consistent with any policies, procedures and/or guidelines adopted by the NCWM or the Committee regarding such representatives;

(e) to convene during the Annual and Interim Meetings of the NCWM, and at such other time as may be called by the Committee Chairman or a majority of the members of the Committee;

(f) to approve and present to the Executive Committee of the NCWM, the Associate Membership Committee's Annual Report for inclusion in the annual report of the NCWM;

(g) to assist in planning and coordinating associate membership events at the NCWM;

(h) to adopt those procedures and policies the Committee deems appropriate to further the objectives and responsibilities set forth herein.

(i) to create special committees as it deems necessary to promote the objectives and carry on the work of the Committee and the associate membership, and to appoint the members of those special committees.

(j) to promote weights and measures principles and techniques amongst the associate members of the NCWM and the general public in conjunction with the efforts of the NCWM.

ARTICLE IV: Meetings

Section 1. Annual Meeting: The Annual Meeting of the associate membership and Associate Membership Committee shall be conducted as one joint meeting to be held during the Annual Meeting of the NCWM and shall be open to all members of the NCWM. Only associate members have voting rights on issues before the associate membership. The time and place of the Annual Meeting shall be published in the NCWM Annual Meeting Program and shall be coordinated with the Executive Secretary of the NCWM so as to avoid, as much as is possible, program and logistical conflicts with associate members.

The agenda for this Meeting shall include the election of officers, reports from the Committee Chairman and Secretary/Treasurer, and other items pertinent to the activities of the associate membership in the NCWM.

Section 2. Interim Meeting: The Interim Meeting of the associate membership and Associate Membership Committee shall be conducted as one joint meeting to be held during the Interim Meeting of the NCWM and shall be open to all members of the NCWM. Only associate members have voting rights on issues before the associate membership. The time and place of the Interim Meeting shall be published in the NCWM Interim Meeting Program and shall be coordinated with the Executive Secretary of the NCWM so as to avoid, as much as possible, program and logistical conflicts with associate members.

The agenda for this meeting shall include any items pertinent to the activities of the associate membership in the NCWM.

Section 3. Special Meetings: Special meetings of the Committee may be called at any other time deemed necessary by the Committee Chairman or by a majority of the Committee. Such special meetings may be held by means of conference telephone or similar communications equipment enabling all members in the meeting to hear one another, and participation in a meeting pursuant to such means shall constitute presence in person at such meetings. Written or oral notice of the date, time and place of all special meetings of the Committee shall be given to each member personally or mailed to his/her usual place of business at least five (5) days prior to the date of the meeting, provided that any one or more Committee members, may waive such notice in writing or by attendance without protest at such meeting.

Section 4. Quorum and Rules of Order: A quorum necessary for a meeting shall consist of a majority of the members of the Committee. The rules contained in Robert's Rules of Order shall govern the Committee in all cases to which they are applicable, and provided that they are not inconsistent with the Constitution or Bylaws or the Special Rules of the NCWM.

Section 5. Voting: Each member of the Committee shall be entitled to one vote on each matter submitted to the Committee for action during special meetings as defined in Article IV, Section 3.

ARTICLE V: Term

Section 1. Term: The term of the individual members of the Committee shall be for a period of five (5) years and shall run from the adjournment of the Annual Meeting of the Committee at which a member is elected through the fifth Annual Meeting thereafter. Individual members completing their term are eligible for renomination and reappointment subject to concurrence of the associate membership at a duly scheduled meeting.

Section 2. Vacancies: In the event a Committee member is unable, for any reason, to fulfill his/her appointed term, a successor to serve the remainder of that term shall be nominated by the Associate Membership Committee for appointment by the NCWM Chairman at the next regularly scheduled meeting.

ARTICLE VI: Officers

The associate members shall, at their Annual Meeting, elect a Committee Chairman, Vice Chairman, and Secretary/Treasurer from their membership each to serve for a term of 1 year, which term shall run from the adjournment of the Annual Meeting at which the officers are elected through the succeeding Annual Meeting of the NCWM.

ARTICLE VII: Duties of Officers

Section 1. Chairman: The Chairman shall:

(a) preside at all meetings of the Committee;

(b) coordinate participation by the associate membership in NCWM program activities;

(c) plan activities and events sponsored by the Committee cooperatively with the NCWM Executive Secretary and NCWM Chairman;

(d) request and obtain concurrence by the Associate Membership Committee relative to NCWM plans for involvement of the associate membership;

(e) report informally to the associate members on the plans and activities of the Committee;

(f) perform such other duties as may be prescribed in this Charter or assigned by the Committee;

(g) submit annually to the NCWM Executive Committee a report concerning the program of the Committee, which report is intended to be included in the final report of the Executive Committee to the NCWM;

(h) formally authorize or concur with all checks written on behalf of the Committee; and

(i) appoint, as necessary, associate members to assist in the planning and coordination of functions to assure the highest level of support to the NCWM.

Section 2. Vice Chairman: The Vice Chairman shall:

(a) assist the Committee Chairman in the planning and implementation of Committee programs;

(b) act and serve on behalf of the Committee Chairman in the event that the Chairman is unable to carry out the duties of that office;

(c) audit annually the Committee Treasurer's report;

(d) perform other duties as are assigned by the Committee Chairman.

Section 3. Secretary/Treasurer: The Secretary/Treasurer shall:

(a) record all proceedings of the meetings of the Committee in a book to be kept for that purpose;

(b) be custodian of the records of the Committee and see that the books, reports, statements, and all other documents and records of the Committee are properly kept and filed;

(c) communicate with the NCWM Treasurer regarding monies collected and distributed on behalf of the associate membership including authorizing, when necessary, checks written on behalf of the associate membership;

(d) submit an annual report at the time of the Annual Meeting of the Committee;

ARTICLE VII: Committees

The Committee, by resolution adopted by a majority of the Committee members at a meeting at which a quorum is present, may designate two (2) or more associate members to constitute a Subcommittee, which Subcommittee shall have and may exercise all such authority as may be provided in the resolution adopted by the Committee.

ARTICLE VIII: Amendments

The Bylaws of the Committee may be amended, added to, or repealed at any Annual Meeting of the membership provided that any proposed changes must be included in the agenda of the Committee and discussed at the Annual Meeting of the Committee at which said changes will be voted on. Amendments to the Bylaws must be approved by a minimum of 2/3 vote of all associate members in attendance at said meeting.

Appendix E - Composition of NCWM Mailing List (as of 6/30/97)

Category	NCWM Members				Nonmembers			Total NCWM Members and Nonmembers			% of total who are members		
	End of 1994-95	End of 1995-96	End of 1996-97	End of 1996-97 % increase	95	96	97	95	96	97	95 %	96 %	97 %
State	831	855	964[6]		664	662	544	1495	1517[6]	1508	56	56	64
County	443	401	380		504	544	512	947	945	892	46[3]	42	42.7
City	214	188	183		341	342	305	555	530	488	38	35	37.5[3]
Subtotal	**1488**	**1444**	**10209**	5.7%	**1509**	**1548**	**1361**	**2997**	**2992[3]**	**2888**			
US Industry	1893	1851	1594		19498	19398	18147	21391	21249	19741	9	8.7	8[4]
Industry (foreign)	36	45	45	-13.5%	341	337	328	377	382	373	9.5	11.7	12
Subtotal	**1929**	**1896**	**1639**		**19839**	**19735**	**18475**	**21768**	**21631**	**20114**			
US govt	60	53	43		239	241	192	299	294	235	20	18	18.2
Foreign govt	41	38	35		172	197	182	213	235	217	19	16	16.2
State & local govt (not W&M)	52	52	40[5]	-17.4%	945	933	916	997	985	956	5	5	4.1
Subtotal	**153**	**143**	**118**		**1356**	**1371**	**1290**	**1509**	**1514**	**1408**			
Guests					381	453	211	381	453	211			
Total	**3570**	**3483**	**3284[1]**	-5.7%	**23085**	**22654**	**21337**	**26655[2]**	**26590**	**24621[7]**	**13.4**	**13**	**13.2**

[1] As of membership closeout 558 members (or 17%) are brand new, never having joined the NCWM previously. In March of 1990 retirees were made complimentary members of the NCWM; in 1997, they number 232 and are not included in the totals here.

[2] The large increase in the mailing list is due to the fact that we are keying in repair firms lists kept by States; this will continue (petroleum device repair firms continue to be entered in the database). Over 16,500 constituents have been added to the potential Associate Member category since January 1, 1991. We continue to recruit these individuals as members through ongoing marketing of NCWM, its resources, services, and publications.

[3] The proportion of weights and measures officials who are members has been increasing since the total number of officials has dropped (attrition, unfilled or abolished positions, for example, have impacted the total number of weights & measures officials).

[4] As the number of potential associate members in the mailing list has grown, the proportion who are associate members has decreased.

[5] A membership category was established to include State and local government employees other than weights and measures (e.g., consumer advocacy, law enforcement personnel, attorneys general, etc.).

[6] Of the 964 State employees, 197 (20.4%) are State Petroleum Program Personnel.

[7] In March 1997 the NCWM database was purged of records having no activity prior to January 1990. This will have the effect of eliminating expenses attendant to marketing NCWM membership to this non-responsive segment of the database.

Appendix F

Report on OIML
By
Samuel E. Chappell, Chief
Technical Standards Activities Program, NIST

10th International Conference of Legal Metrology

Canada hosted the 10th International Conference of Legal Metrology and the 31st meeting of the International Committee of Legal Metrology (CIML) of the International Organization of Legal Metrology (OIML) from November 4 through 8, 1996. Dr. Collins, Director of the Office of Standards Serviced at NIST, led the U.S. delegation to the Conference, and I represented the United States at the meetings of the CIML. Representatives of 41 of the 54 OIML member nations, 10 of the 42 corresponding member nations, and 9 regional and international organizations attended. The U.S. delegation to the Conference consisted of the following persons including myself:

Dr. Belinda L. Collins
Director, Office of Standards Services, NIST

Mr. John B. Hitchcock
Scientific Programs, U.S. Department of State

Dr. Charles D. Ehrlich
Office of Standards Services, NIST

Ms. Barbara J. Bloch
Chair, National Conference on Weights and Measures
Assistant Director, California Measurement Standards

Mr. Charles A. Gardner
Chair, Board of Governors, National Type Evaluation Program
Director, Suffolk County Weights and Measures, NY

Dr. Gilbert M. Ugiansky
Chief, Weights and Measures, Office of Measurement Services, NIST

Mr. Daryl E. Tonini
Technical Director, Scale Manufacturers Association

Mr. Bob Traettino
Vice President of Quality, Liquid Controls Corporation
Chair, Meter Manufacturers Association

Mr. Gary Lameris
Hobart Corporation

The Conference meets every 4 years and has the main objectives of ratifying the work completed by CIML in the past 4 years and approving a budget for the next 4 years.

The third meeting (November 4) and a Workshop (November 1) of the Asia-Pacific Legal Metrology Forum (APLMF) was also held in Vancouver prior to the Conference.

Significant decisions and reports at the Conference of particular interest to the NCWM included the following:

- Ratification of OIML Recommendations (of particular interest to NCWM) previously approved by CIML:
  In **1993**, six Recommendations were approved.
  - Weights of Classes E_1, E_2, F_1, F_2, M_1, M_2, M_3
  - Continuous Totalizing Automatic Weighing Instruments(Belt Weighers) (Revision of R50)

  In **1994**, eleven Recommendations and Annexes for two others were approved.
  - Pipe Provers for Testing Measuring Systems for Liquids
  - Characteristics of Standard Capacity Measures and Test Methods for Measuring Systems
  - Testing Procedures for Pattern Examination of Fuel Dispensers for Motor Vehicles
  - Measuring Assemblies for Liquids Other Than Water
  - Diaphragm Gas Meters (Revision of R31)
  - Nonautomatic Weighing Instruments (Amendment to R76)
  - Discontinuous Totalizing Automatic Weighing Instruments (Annex for test procedures- R107)

  In **1995**, three Recommendations and an Annex for another were approved.

- "Automatic Catchweighing Instruments" (revision of OIML R51) developed by the United Kingdom.
- "Automatic Gravimetric Filling Instruments" (revision of OIML R61) developed by the United Kingdom
- "Automatic Rail-Weighbridges" Annexes on the test procedures and the test report format for OIML R106 developed by the United Kingdom

In **1996** at this Conference, four Recommendations and an Annex for another were submitted directly for ratification.

- "Information on Labels of Prepackaged Products" (revision of R79)
- Annex on Testing Procedures, "Continuous Totalizing Automatic Weighing Instruments"

All 24 Recommendations and 4 Annexes for existing Recommendations were supported by the U.S.A. and were ratified by the Conference. Two proposed Recommendations to be presented directly for ratification by the Conference were not supported by the U.S.A. and some other member nations and were withdrawn. They were revisions of OIML Recommendations on "The pH Scale" and "Water Meters."

- Report on the status of the work of the OIML technical committees and subcommittees was presented by myself. I also mentioned the preparation of a report by BIML on a recent survey of the implementation of OIML Recommendations and the identification of compatible regulations and voluntary standards with the Recommendations in member countries. The Conference encouraged the committees to take any necessary steps that could possibly accelerate and improve the quality of the work and urged OIML members to foster the implementation of the OIML Recommendations in their national regulations or voluntary standards to the extent possible.

- Report on the status of the program of the OIML Certificate System was presented by Manfred Kochsiek, CIML Member, Germany, and myself. The advisory group on certification (TAG_{cert}) met in February 1996 and identified efforts within various technical committees to further develop the work in addition to revising the publication on the "OIML Certification System for Measuring Instruments." Of significance were the consideration of topics for certification on application to modules of instruments, application to families of instruments, mutual recognition of certificates, and the role for accreditation of testing laboratories. The Conference encouraged the expansion of the system to include all instruments addressed in the OIML work program to the extent possible.

- The long-range policy paper publication in 1995 was noted. The following topics were stressed for future activity: assistance to developing countries (Vice President Kochsiek was appointed Vice Chairman of the OIML Development Council), closer cooperation with industry in the work including both producers and users of instruments, development of a paper on the role of the "measurement system" on a regional and global scale, identifying the role of accreditation in legal metrology, and strengthening and modernizing the OIML communication efforts.

- A proposed budget for 1997-2000 for the International Bureau of Legal Metrology (BIML) was presented by B. Athané, Director. The United States objected, as did Canada, to the proposed increases over the budget for the past four years. The proposed overall increase in the budget was slightly less than 2 percent and was based on the anticipated inflation rate in France. All other member nations present supported the proposed budget.

- The resolution taken by the 30th CIML meeting in Beijing regarding the French government proposal for rapprochement and possible merger of the treaties for OIML and the Mètre Convention was discussed. The President of CIML reported on the results of two meetings of the Joint Working Group, with representatives from both sides, which considered the proposal. A resolution on the subject was developed and stressed the importance of continuing discussions to identify areas of mutual interest and cooperation with the Mètre Convention and other international organizations having an interest and activities in metrology.

A report was presented by B. Athané on the activities of BIML over the last year. Reports were also presented on relevant activities by representatives of liaison institutions including APLMF, BIPM, CECIP, CIMET, ILAC, and WELMEC.

It was decided that the 11th Conference would be held in Paris in 2000 unless special circumstances with regard to collaborations with other international organizations make it appropriate to consider another date. In such a case, CIML was instructed to make the necessary decision at a future meeting.

International Committee of Legal Metrology (CIML) Meeting

The CIML establishes the policy and approves the technical plans and work of the various OIML Technical Committees. It met just before and immediately following the Conference. It took note of the decisions of the Conference particularly with regard to the work of the technical committees and subcommittees, the certificate system, the work of the development council, and the long range plans.

An Assistant to the Director, Mr. Attila Szilvassy of Hungary, was elected to replace Dr. A. Vichenkov of Russia.

The next meeting of CIML will be held in October 1997 in Rio de Janeiro, Brazil. During the same period, meetings will also be held of the OIML Development Council and of the Sistema Interamericano de Metrologia (SIM). It was also confirmed that the 33rd meeting of CIML will be held in Seoul, Republic of Korea in November 1998. The 1999 meeting of CIML is expected to be held in Paris, France. A meeting of the Presidential Council of CIML was scheduled for February 17 - 18, 1997, in Paris.

Other Matters

A round table discussion on "accreditation in legal metrology" was held and led by P. van de Leemput of the Netherlands who presented the global view from the point of view of ILAC. S. Bennett of the U.K. and J.-F. Magana of France presented views from the perspective of legal metrology. The audience provided a lively discussion with questions and comments on the topic.

In response to a recommendation of the Presidential Council and in commemoration of the 40th anniversary of the First International Conference, the Conference sent letters of thanks and certificates of appreciation to previous participants who have made significant contributions to the work of OIML. Otto Warnlof, who recently retired from NIST, was among those so honored.

Presidential Council Meeting

A meeting of the CIML Presidential Council took place at BIML on February 17 and 18, 1997.
The following subjects were addressed:

- The technical activity of the organization was reviewed including the annual reports prepared by the Secretariats of the various technical committees and subcommittees on current projects and future plans.

- The President appointed a task group to study the need and role of accreditation in Legal Metrology. In particular, the study will focus on how accreditation applies to the OIML "Certificate System for Measuring Instruments" and its possibility of fostering mutual acceptance of Certificates. The task group included S. Chappell (Chair), S. Bennett, J. Birch, and B. Athané. Other experts could be invited to participate. The first meeting of this task group took place in May 1997 in Teddington, U.K.

- It was decided to develop a paper on Legal Metrology and Standardization for the Bulletin to explain why OIML develops Recommendations on the performance requirements of legal measuring instruments instead of the task being carried out by other international standardization organizations such as ISO or IEC.

- It was decided that OIML policy should establish liaison with appropriate regional Legal Metrology organizations and act as a coordinator when appropriate; however, regional activities should not interfere with OIML members nations fulfilling their OIML obligations.

- M. Kochsiek presented a report about discussions of developing countries with T.Quinn, Director of BIML (International Bureau of Legal Metrology) and IMEKO (International Measurement Confederation). It was decided to carry out cooperatively a study of the needs of developing countries in all fields of metrology that may assist in defining the role and actions for assistance by OIML.

- The President appointed a task group including himself, Kochsiek, and Athané to screen potential candidates for the position Assistant Director of BIML which will be open in January 1997 with the departure of Philippe Degavre. A selection will be made by CIML at its next meeting.

Meeting of the Joint Working Group (OIML and Mètre Convention)

The meeting of the Joint Working Group took place at the International Bureau of Weights and Measures (BIPM) on February 19, 1997. The following persons participated: representing CIML - G. Faber (President, the Netherlands), S. Chappell (Vice President, U.S.A.), M. Kochsiek (Vice President, Germany), J. Birch (Australia), and B. Athané (Director, BIML); representing the Mètre Convention (the International Committee of Weights and Measures - CIPM) - J. Kovalevsky (President, France), K. Iizuka (Vice President, Japan), K. Gebbie (Vice President, U.S.A.), W. Blevin (Secretary, Australia), and T. Quinn (Director, BIPM); and invited guests: K. Birkeland (Past President - CIML, Norway)representing OIML; D. Kind (Past President - CIPM, Germany); J. Gilmore representing the International Laboratory Accreditation Cooperation (ILAC); and R. Kaarls (the Netherlands) representing ILAC and the European Laboratory Accreditation Cooperation (EAL).

The major topics discussed were as follows:

- Participation of BIPM in the OIML Development Council
- Report on the BIPM meeting with Directors of National Measurement Institutes at which a program to establish "equivalence"of national standards was presented and generally accepted.
- Relations with ILAC were explained by J. Gilmore of Australia and President of ILAC along with Robert Kaarls of the Netherlands and President of EAL. Accreditation of activities associated with metrology was discussed especially with regards to traceability and mutual recognition of certificates of calibrations and of conformance to performance requirements of measuring instruments.
- A report was presented on ISO/TAG4 "Metrology" that met at BIPM in November 1996. At that meeting, the "Joint Committee for Guides in Metrology" was established which will be responsible for maintaining the "International Vocabulary for Metrology" and "Guide to the Expression of Measurement Uncertainty," and for developing similar guides of importance for metrologists.
- The opportunities for future cooperation included assistance to developing countries, cross referencing relevant activities in OIML, the Mètre Convention, and ILAC, and publication of joint, aperiodic newsletter.

It was agreed that the next Joint Working Group meeting would held in February 1998 to discuss progress in cooperation and future activities.

Activities of OIML Secretariats

This part of the report provides: (1) an identification of work, either Recommendations (Rs) or Documents (Ds), being developed in Technical Committees (TCs) and Technical Subcommittees (SCs) of specific interest to the NCWM and (2) a schedule of activities of secretariats, the U.S. National Working Groups (NWGs), and the International Working Groups (IWGs) of committees and subcommittees that have recently taken place or are planned for the near future. More details of these activities were reported by D. Ripley to the Specifications and Tolerances Committee of the NCWM.

- TC1 Terminology (Poland)

  A second committee draft (CD) revision of the "Vocabulary of Legal Metrology" (1978 Edition) has been distributed by the Secretariat for review and comment. This vocabulary will complement the "International Vocabulary of Basic and General Terms in Metrology" developed by BIPM, IEC, IFCC, ISO, IUPAC, IUPAP, and OIML (latest Edition 1993 published by ISO).

- TC7 Instruments for Measuring Length and Associated Quantities (United Kingdom)

  - TC7/SC5 Multi-dimensional Measuring Instruments (Australia)

  A third committee draft (CD) Recommendation on "Multi-dimensional Measuring Instruments" developed by the Secretariat was discussed at an IWG meeting from October 28 - 30, 1996 at NIST. A forth CD Recommendation is under development by the Secretariat and will take into account the decisions at the IWG meeting.

- TC8 Instruments for Measuring Quantities of Fluids (Switzerland)

- TC8/SC1 Static Volume Measurement (France)

The Secretariat submitted a draft revision for OIML R85 "Automatic Level Gauges for the Measurement of Liquid in Fixed Storage Tanks" to CIML for comment and vote by January 15, 1997. The U.S.A. voted yes.

- TC8/SC2 Static Mass Measurement (Australia)

The Secretariat submitted a draft OIML Recommendation "Measuring Systems for the Mass of Liquids in Tanks" to CIML for comment and vote by April 1, 1997. The U.S.A. voted no.

- TC8/SC6 Measurement of Cryogenic Liquids (U.S.A.)

A first draft revision of OIML R81 "Measuring Devices and Systems for Cryogenic Liquids" was developed by the Secretariat on the basis of the decisions made at the last IWG meeting in Braunschweig, Germany in May 1996. It was distributed to CIML for comment and vote by July 31, 1997. The U.S.A. voted yes.

- TC9 Instruments for Measuring Mass and Density (U.S.A.)

A questionnaire about proposals for a revision of R60 "Load Cells" was distributed by the Secretariat to collaborating member nations. A NWG meeting was held to discuss the proposal in conjunction with the Interim Meeting of the NCWM and another at NIST in March 1997. These meetings were followed by a IWG meeting in Teddington, U.K. on July 7-8, 1997 to discuss responses to the questionnaire and more detailed plans for developing a first committee draft revision of R60.

- TC9/SC2 Automatic Weighing Instruments (United Kingdom)

A third CD draft Recommendation on "Automatic Road Weighbridges" has been developed and distributed for vote by the Secretariat based on the decisions at the last IWG meeting in Braunschweig, Germany in May 1996. An IWG meeting was held in Teddington, U.K., on July 7-8, 1997, to discuss the 3rd CD.

- TC9/SC3 Weights (U.S.A.)

Annexes on test procedures and the test report format for OIML R111 "Weight Classes E, F, and M" were developed by the Nordic Task Group and were discussed a Workshop held in Boras, Sweden in October 1996. These Annexes were distributed by the Secretariat to collaborating member nations for comment and vote by June 1997.

Third Asia-Pacific Legal Metrology Forum (APLMF)

A 1-day meeting and a 1-day workshop were held for APLMF prior to the International Conference of Legal Metrology and were attended by representatives of 15 APLMF member economies and 1 observing international and 1 regional organization. Australia, as Secretariat, developed and coordinated the agenda for the meeting and workshop. In addition to myself, B. Bloch (NCWM), C. Gardner (NCWM), C. Ehrlich (NIST), and D. Tonini (SMA) represented the United States at the meetings.

The workshop was held first and focused on the results of the surveys of member nations on "Legislation" and "Training" with the aim of identifying needs for development and harmonization. I led the discussion on legislation, and Mr. Dai Runsheng of China led the discussion on training during which a report was presented regarding a cooperative project between China and Australia on this subject. The plans for the on-going intercomparisons of "standard weights" (according to OIML R111) and of the "pattern evaluation of non-automatic weighing instruments" (OIML R76) were reviewed. The U.S.A., namely through NIST (weights) and the National Conference of Weights and Measures (non-automatic weighing instruments), is participating in both intercomparisons. A plan for a future intercomparison of the "pattern evaluation of load cells" (OIML R60) was reviewed. A planning session for this intercomparison was held in Teddington, U.K. on July 7, 1997, in conjunction with other meetings of OIML/TC9 "Instruments for Measuring Mass and Density."

At the meeting of APLMF, the following items were discussed:

- a report on the results of the workshop.

- a report on the other surveys conducted: "prepackaged products," "utility meters," "specialized legal metrology training facilities," and "legal metrology industry consultive structures," including plans for action on the basis of the survey results.

- a report by Dr. K. Birkeland on a survey of "legal metrology infrastructure needs of nine Asia-Pacific developing economies" along with 15 recommendations for action.

- the establishment of working groups on instruments for "measurement of moisture in rice" and "medical measurements."

A draft "Memorandum of Understanding" was presented by the Secretariat that would have the effect of formalizing the structure of APLMF. Members were requested to review this MOU on which action may be taken at the next meeting.

A report was presented on the relationship APLMF with other specialist regional bodies in the Asia-Pacific region (APLAC, APMP, PAC, PASC) and on the first APEC Conference on "Standards and Conformance."

Plans for the Fourth APLMF were presented.

Appendix G
Summary APLMF/OIML Meeting Report

To: NCWM Executive Committee/NTEP Board of Governors

From: Charles Gardner, Chairman, NTEP Board of Governors
Barbara Bloch, Chairman, NCWM

Meeting Location: Vancouver, Canada

Meeting Dates: November 1 and 3, 4 through 8

Purpose of Trip: Represent the NCWM at meetings of the Asia-Pacific Legal Metrology Forum (APLMF); the International Organization of Legal Metrology (OIML), and its Committees.

APLMF Report:

Participating Economies: Australia, Canada, People's Republic of China, Indonesia, Japan, Republic of Korea, Malaysia, Mexico, New Zealand, Papua New Guinea, Russian Federation, Singapore, Chinese Taipei, Thailand, United States of America and Vietnam.

Observers: International Organization of Legal Metrology (OIML), Western European Legal Metrology Co-operation (WELMAC), and Dr. Knut Birkeland.

Absent Economies and Observers: Hong Kong, Mongolia, Phillippines and the Specialist Regional bodies of APLAC, APMP, PAC, and PASC.

This was the third meeting of the APLMF, with one day devoted to consideration of the Working Parties on Legislation and Administration, Intercomparison of Calibration & Pattern Approval Testing and Training. The second day covered the APLMF agenda.

One project currently underway is the intercomparison and pattern approval testing of nonautomatic weighing instruments among the participating economies of Australia, Canada, PR of China, Germany, Japan, Republic of Korea, Malaysia, New Zealand, United Kingdom and the United States (the Board of Governor's approved NTEP's participation in this project last year). At this meeting, Russia submitted a request to be included in the intercomparison. This project is expected to be completed in June 1997.

Training has been considered a very high priority need, and a joint Australia-China project on measurement skills and competency based standards is currently being developed with the China State Bureau of Technical Supervision. The project aims to develop a policy for harmonized measurement skills development in the Asia-Pacific region.

The formation of a Working Party to develop the framework for Mutual Recognition Agreements on legal metrology was also considered. In addition, the Forum adopted the following work program for 1996/97:

* Publication in 1997 of a **"Handbook of Legal Metrology in the Asia Pacific."**

* Information on specialized testing facilities be included in **"A Directory of Specialized Testing Facilities"** to be published by the APLMF, or that this information could be included in the 1997 **Handbook.**

* A Working Group be established to study rice moisture meters. The Secretariat to circulate the scope and objectives of the WG and seek interest from members.

* A Working Group on Medical Measurements with a project on Sphygmomanometers (blood pressure meters). The Secretariat to circulate the scope and objectives of this WG and seek interest from members.

* The Secretariat study the feasibility of establishing an Internet web site to facilitate and improve communication amongst Forum members.

* A follow-up survey on Utility Meters be conducted to obtain further information on a number of specific areas such as water metering, telephone metering and gas metering, covering all areas of utility metering activity.

* That "model metrology legislation" would be developed in cooperation with OIML.

* A workshop/seminar on legislation and administration be organized in 1997.

* That translation of the legislation into English for those economies where their legislation is currently not in English, be pursued.

* That priority be placed on the harmonization of pre-packed goods and the Working Party meeting be held in association with the Fourth Forum meeting.

* To establish a training program that is consistent with the processes and principles established in the APLMF Training Policy, and to develop appropriate training strategies for the following priority areas:

-the mutual understanding and implementation of OIML Recommendations IR 76 and 60;

-high capacity fluid flow and automatic weighing instruments; and

-the verification of specific legal metrology instruments in accordance with OIML criteria

* A survey be conducted to determine the extent of involvement of consumers with the Forum and to examine ways in which they can participate in Forum activities.

* The Intercomparison on Load Cells and Mass to commence in 1997.

* That the APLMF support a proposal to hold the First APEC Round Table on Standards and conformance to discuss key issues in Standards and Conformance.

* That the Secretariat will formalize the scope, objectives and target outcomes for establishing the Working Group on Mutual Recognition Arrangements.

Further, the Forum endorsed the development of a **"Memorandum of Understanding"** in principle, to establish a more formal structure while continuing to recognize that membership of the Forum is voluntary and has no binding effect.

Future Meetings: As the 1997 OIML meeting is to be held in Rio de Janeiro, Brazil, which is outside the Asia-Pacific region, a more appropriate site is being sought for the next APLMF. It was agreed that the fourth meeting be held between July to September 1997, in association with the workshops/seminars proposed earlier.

OIML Report:

This was the 10th International Conference of Legal Metrology(OIML), and the 31st meeting of the International Committee of Legal Metrology (CIML). The Conference is the plenary body established by the OIML Convention to set policy, to determine the goals of the organization, to ratify the work output of the CIML and to approve the OIML's quadrennial budget. Each member nation participates through its officially appointed delegation and votes in accordance with positions approved by its government. It was a privilege to be a part of the U.S. delegation, with observer status.

The Conference agenda included reports on activities of the last four years with regard to the CIML, new member nations' accessions, activities of developing countries and liaison activities with other international institutions. Major focus of the Conference was the progress of the projects of OIML's 18 technical committees and 45 subcommittees, as well as voting on formal ratification of 29 Recommendations.

A major topic of interest for the United States is the OIML Certificate System, and the mutual recognition agreements needed for participation. The OIML Certificate System was established in 1991 to facilitate the activity of the national legal metrology services of OIML member nations and to promote the use of measuring instruments that comply with OIML requirements. A manufacturer of measuring instruments included in a category covered by the System many apply for an OIML certificate in a member nation that participates in the System. Tests are performed according to the relevant Recommendation and a certificate

is issued if the pattern or type of the instrument complies with all requirements. The certificate may then be used by the manufacturer as proof of the conformity of the pattern of the instrument to OIML requirements.

OIML committees are looking at further development of the certificate System, which include establishing criteria for arrangements on the recognition agreements of OIML certificates and test results, organizing intercomparisons aimed at harmonization of national and international requirements and pattern evaluation procedures, and coordinating the development of OIML certification with relevant activities performed by international and regional organizations concerned with testing, certification, conformity assessment, accreditation and related subjects.

Appendix H

Measurement Canada

Presentation to the National Conference on Weights and Measures

January 1997

MEASUREMENT CANADA
MESURES CANADA

Background - Budget Reductions

- Over the past 5 years, Measurement Canada's financial resources have been reduced by 30%.
- This has resulted in reductions to the number of Measurement Canada employees in the order of 20%.
- For future years, we expect continued reductions.

Background - Amalgamation of Two Activities

- In June 1995, two closely related sub-activities of the former Legal Metrology Branch, namely Weights and Measures and Electricity and Gas, were amalgamated into one.
- The number of Regions increased from five to six.
- The number of District Offices decreased from 35 to 18.

Background - Special Operating Agency Status

- A Special Operating Agency is a service delivery unit within a government department that is given more direct authority and responsibility in return for commitments to improved service delivery and performance:
  - A more business like environment
  - More emphasis on client service
  - Opportunities to better manage revenues
- Measurement Canada became a Special Operating Agency of Industry Canada in August 1996.

The Challenge

- To achieve our mission of ensuring equity and accuracy in the marketplace with reduced resources

while

- creating a strong and positive corporate culture that instills pride and motivation in our staff.

The Solution

- Development of a long term corporate Vision and non-negotiable Values that Measurement Canada management and employees understand and believe in.
- Development of a Strategic Direction that will guide Measurement Canada toward its Vision.
- Participatory management principles used in the development of the Vision, Values, and Strategic Direction:
  - 14 Senior Managers participated in the exercise
  - on-going communication with all Measurement Canada staff throughout the exercise

Mandate

Measurement Canada administers and enforces the Electricity and Gas Inspection Act and the Weights and Measures Act through the exclusive constitutional authority of the Government of Canada.

Credo

Fair Measure for All

Mission

Our mission is to ensure equity and accuracy, where goods and services are bought and sold on the basis of measurement, in order to contribute to a fair and competitive marketplace for Canadians.

Vision

1. Our business is trade metrology.
2. We are the cornerstone of fairness in all trade measurement.
3. We make a difference; our contribution to a fair marketplace is recognized and valued.
4. We are committed to exceeding our clients' expectations at every opportunity.
5. We are evolving; we challenge the status quo; we seek out creative and innovative opportunities to maximize our effectiveness and efficiency.
6. We are committed to an environment that values teamwork, effective communication, and the pursuit of knowledge and excellence.

Values

1. We deal with our clients and each other with HONESTY, INTEGRITY, RESPECT and FAIRNESS.

2. We RECOGNIZE and ACKNOWLEDGE EFFORTS that contribute to the success of our organization.

3. We value one another; we are a team; we seek solutions through DIALOGUE and we WORK TOGETHER to achieve our goals.

4. We encourage LEARNING and INNOVATION that results in better service to our clients.

5. We pride ourselves in taking OWNERSHIP of our work and RESPONSIBILITY for our actions and decisions.

Strategic Direction

1. We will fulfill our mandate by periodically assessing measurement activities in all trade sectors and only intervening where necessary to ensure accuracy and equity in the marketplace as stated in our mission.

   Time Frame: We will exercise our mandate completely by 2011.

2. We will develop criteria for determining both our entry into and exit from trade sectors and our level of intervention. Stakeholders' informed views will be a key element in our decisions.

   Time Frame: We will develop this criteria by June 30, 1997.

3. Measurement Canada will provide the following services directly:
   - establishing rules and requirements;
   - resolving complaints and disputes; and
   - monitoring the marketplace.

   Time Frame: On-going

4. Measurement Canada will use alternate service delivery mechanisms such as partnering for:
   - device approvals;
   - calibrations; and
   - inspections.

   Time Frame: This transition will be completed by 2007.

5. Measurement Canada will examine the use of alternate service delivery mechanisms, such as partnering, for net quantity inspection and the following functions:
   - Finance;
   - Administration;
   - Training;
   - Engineering; and
   - Informatics.

   Time Frame: This will be completed by 2002.

Strategic Direction (cont'd)

6. Without compromising its overall strategic direction, Measurement Canada will fund its activities from its revenues.

   Time Frame: This will be accomplished at the earliest opportunity but no later than April 1, 2000.

7. We will equip ourselves with the skills and knowledge we will need in order to respond to changing roles necessitated by the strategic direction.

   Time Frame: On-going

8. We will implement strategies to ensure:

   (a) Our employees understand and value our strategic direction and their contribution to its implementation;
   (b) our Department and central agencies understand and support our Strategic Direction;
   (c) existing and potential partners understand and value our Strategic Direction and the business opportunities that it provides; and
   (d) our beneficiaries recognize our contribution to a fair marketplace.

   Time Frame: On-going

9. Measurement Canada will implement an on-going process to:

   (a) obtain input from clients about our services;
   (b) set service standards; and
   (c) monitor our services in regards to client expectations and our service standards.

   Time Frame: This process will be implemented by March 1998.

10. Measurement Canada will implement an on-going employee-driven process to obtain, evaluate and respond to input and suggestions on improving our work environment.

    Time Frame: This process will be implemented by March 1998.

11. In implementing its strategic direction, Measurement Canada will make use of quality assurance principles.

    Time Frame: Continuous

Implementing the Strategic Direction

- Formation of nine Strategic Teams that will be responsible for ensuring that the Strategic Direction is met.
- Teams to be made up of Measurement Canada staff from various regions and working levels.
- Expert consultants to be utilized by Strategic Teams as needed.

Appendix I

Metrology Subcommittee Report
January 1997

The information in this report was prepared by the Subcommittee Chairman, L.F. Eason, for presentation to the Executive Committee at the January 1997 Interim Meeting. Several key activities took place in early January preventing the entire Subcommittee from discussing and providing input and comments prior to the Interim meeting and subsequent publication. A number of critical issues are presented in this report that affect each State metrology laboratory; however, some of the background information and controversial issues are not included since no consensus has been obtained from the Subcommittee or the NCWM. Key activities addressed at the last minute included: 1) a decision at NIST to cease formal accreditation of State laboratories through the Office of Weights and Measures; 2) an NCWM survey of the State laboratories to evaluate their workload; and 3) a national forum held at NIST to discuss the formation of a National Council on Laboratory Accreditation (NACLA).

Laboratory Accreditation and State Laboratory Program (SLP) Workload

Dr. Peter Heydemann, Director of NIST Technology Services, announced major changes to the State Laboratory Program as described in a letter to State Weights and Measures directors in January 1997. A decision was made to cease providing accreditation of State laboratories through the NIST Office of Weights and Measures. Changes in requirements for laboratory audits make it impossible for OWM to both provide training and support and then audit the same laboratories. Basically, NIST OWM has been supported to do what is needed to ensure that States are able to make accurate and traceable measurements. Each jurisdiction can survey its clients and determine the need for accreditation. If accreditation is needed, the State can apply to NVLAP and pay fees according to their published schedule.

The letter from Dr. Heydemann indicates that the following decisions have been made:

1. The NIST Office of Weights and Measures (OWM) will continue to provide what is needed to assure that State Laboratories are able to make accurate measurements.
2. OWM will change the recognition of State Laboratories that comply program requirements from the current "Certificate of Accreditation" to a "Certificate of Traceability."
3. State Laboratories requiring "Accreditation" may apply to the NIST National Voluntary Laboratory Program (NVLAP) and be responsible for the associated fees.
4. The NIST Handbook 143 will be revised to reflect these decisions.

The letter provided background and perspective regarding the decisions yet left the following issues and concerns open to consideration:

1. Effect on the system of accredited metrology laboratories and potential fragmentation the State laboratory program.
2. Dependance, in today's global economy, on laboratory "Accreditation" as the only generally accepted proof of traceability.
3. Reduced State Laboratory recognition while meeting the same criteria required by NVLAP.
4. Unfunded cost of NVLAP accreditation for the State Laboratories.

The majority of the Metrology Subcommittee members feel strongly that the United States needs a healthy system of accredited metrology laboratories across the country. Making accreditation dependent on a State's ability to find the funding could significantly fragment the program. From its beginning, this program was envisioned as a system designed to change and adapt as needed to serve the measurement needs of the State. In today's global economy, regardless of being right or wrong, trade incentive or trade barrier, quality assurance or paper chase, industry often requires laboratory accreditation. Accreditation has become the international buzz word and a generally accepted path to prove traceability. The importance of accreditation is indicated in Dr. Heydemann's memorandum. He makes it clear that NVLAP will not accept an OWM recognized laboratory as capable of making traceable measurements unless they are also NVLAP accredited.

In Dr. Heydemann's memorandum, it was stated that "subsidizing the cost of accreditation is perceived as an 'unfair market advantage' to State laboratories." Yet, based on the Articles of Confederation and the United States Constitution, the founding fathers of the United States saw establishment and propagation of an unbiased standard of weights and measures exclusively as a government responsibility. Rather than being an 'unfair market advantage', a firm measurement foundation is essential to

industrial competitiveness. In today's market place of ISO quality requirements, the convenient, cost effective availability of accredited measurement services as historically provided by the State Laboratory Program is needed.

One oversight in the function of the State Laboratory Program, is that the impact of our program on the U.S. measurement system has not been documented recently. Therefore, a survey was developed by the Metrology Subcommittee and faxed to all State Laboratory Program participants. Subcommittee chairman, L.F. Eason, has summarized the results of 47 respondents. Based on survey responses, the following observations can be made:

1. The States have a large calibration workload, providing support for more than 390,000 weights, 12,500 test measures and provers, 2,900 pieces of glassware, 2,500 length standards, 1,100 thermometers, 20,000 tuning forks (for police radar units), and 400 timing devices.

2. The State Laboratory Program has a large and diverse customer base with over 19,000 companies across the nation. Less than 8 percent of customers are weights and measures inspectors and approximately 52 percent of customers are weights and measures related (i.e., weights and measures inspectors and scale and petroleum service companies). It should be noted, however, that based on questioning 182 scale service companies that are customers of the SLP laboratories, only about 63 percent of their workload is related to regulatory weights and measures activities. Therefore, approximately 37 percent of the work State Laboratory Program laboratories perform for scale service companies serves industry, rather than the State's regulatory weights and measures program. Also, approximately 22 percent of the customer base is from general manufacturing and almost 9 percent is from quality of life industries (such as pharmaceutical and health service companies).

3. Average turn around times for SLP laboratories are reasonable. The time customers have to be without their standards averages only a few days.

4. A tremendous amount of work is being done by SLP metrologists for OWM. Respondents identified almost 5,700 hours (2.8 person years) per year as time spent helping the Office of Weights and Measures in support of the State Laboratory Program, which confirmed previous estimates made by OWM.

5. The State weights and measures programs are already leveraged and act in partnership with private service companies and device technicians. W&M programs administer registered device technician programs that include nearly 5,500 registered service companies and more than 21,500 registered device technicians.

The survey verifies that there is a tremendous amount of work being done by the State Laboratory Program laboratories throughout the United States. There is no private agency or company in place to take over this workload. For scale companies to ship large weights to one of the NVLAP accredited private laboratories, they would be without the weights for more than 2 weeks for shipping alone. Shipping costs would be in the thousands of dollars. Finally, the potential for damage on return would render the tests useless.

It is the perception that, contrary to assurances, services are being reduced. States are being given less recognition while striving to meet the same criteria. The State Laboratory Program is functioning as an efficient, integral part of the national measurement system, supporting commerce and industry as it was originally intended. As indicated by the survey, 47 laboratories disseminate NIST measurements to more than 19,000 companies for more than 400,000 standards of mass, volume, length, and temperature throughout the United States. These companies use these measurements to verify the quantity or quality of virtually every product and service produced. Everyone in the United States and many others internationally benefit from the work of the State Laboratory Program. This is the type of efficiency that meets the Congressional mandate of the *Technology Transfer Act of 1995*. The NCWM Metrology Subcommittee believes this program should be supported, not diminished. Failure to fund the accreditation of State laboratories may even provide a competitive market advantage to companies with laboratories that are accredited in similar measurement parameters (only three at this time), at the expense of creating a significant obstacle to several thousand companies across the nation served by the State Laboratory Program.

National Council for Laboratory Accreditation (NACLA) Open Forum, January 7, 1997

At the request of the NCWM Chairman, L.F. Eason attended the January 7, 1997, National Council for Laboratory Accreditation (NACLA) open forum at NIST in Gaithersburg, MD. A draft document, "Proposed Structure for the National Council for Laboratory Accreditation (NACLA)" was the primary focus of this meeting. Copies were distributed to Executive Committee members during the Interim Meeting. NACLA was proposed by an informal Laboratory Accreditation Working Group (LAWG) that has been meeting since 1994.

The proposed organization includes a board of directors with a balanced representation from laboratories, assessors, users and other stakeholders, including government regulators. Discussions identified many perceived benefits of the program, but also many obstacles that must be overcome. The common benefit stressed was reciprocity of accreditation, both domestically and internationally. Without reciprocity, this will simply be another level of bureaucracy.

The primary obstacle to NACLA is the diversity of laboratories covered by ISO Guide 25. There was much discussion about how such a diverse group could develop consensus standards. The structure of the NCWM was mentioned as a model to overcome this obstacle.

What NACLA can mean to the NCWM should be evaluated further. Initial and long term representation could benefit our laboratory programs. As the State Laboratory Program laboratories seek accreditation, NACLA could be influential in establishing the reciprocity for all of the accredited laboratories. The experience with accreditation processes could also have long range benefits to the NTEP and Weights and Measures field enforcement programs as domestic and international reciprocity needs increase. NACLA, if successful, will be a unified voice for domestic accreditation policy. NCWM, as a NACLA stakeholder, will have a voice to express concerns and propose changes, solicit support, and evaluate the merits of international proposals.

The forum concluded with a strong show of support for the formation of NACLA. Based on this show of support, the LAWG will work to form an Interim Board of Directors for NACLA that will be charged with the responsibility of drafting a charter and defining NACLA structure and policies. Four members of this interim board are to be government representatives. Nominations were accepted until February 7, 1997. Based on the history and organization of the NCWM and the potential stake our laboratories hold in this process, Subcommittee Chair L.F. Eason recommended that the NCWM Executive Committee nominate a member of this interim board of directors. With the concurrence of the Executive Committee, Bruce Adams was recommended for nomination.

NCSL/USNMRC Survey of NIST Calibration Services

During the 1996 annual meeting of the National Conference on Weights and Measures in New Orleans, it was apparent that very few of the State Laboratory Program laboratories had received a copy of the NCSL/USNMRC (National Council of Standards Laboratories / U.S. National Measurement Requirements Committee) survey of NIST calibration services distributed earlier in the year. The Subcommittee felt it was important for State Laboratory Program participants to be given a chance for input since all are dependant on NIST calibrations and many have had recent calibrations.

The survey was faxed by the Subcommittee Chair to all State Laboratory Program participants on August 19, 1996. A request was made for responses to be sent to Mr. Laurie Baker who compiled the information for NCSL and L.F. Eason as chair of the NCWM Metrology Subcommittee. Twenty-five responses were received from State Laboratory Program participants. These respondents represented nearly all of the State Laboratory Program labs with recent NIST calibrations.

Generally, respondents were very complimentary of the NIST personnel in all three of the calibration areas receiving responses. Jerry Keller, Bill Crupe, John Houser, and Georgia Harris all received many positive comments on their courtesy, technical competence, and willingness to help. Since the distribution of the survey John Houser, has received an award from NIST for making dramatic improvements in the uncertainty of volume calibrations.

However, there were several concerns raised about the calibration services, especially mass calibration. Sixteen responses dealt with the high cost of NIST mass calibration. These costs pose severe problems for state budgets. Twelve responses addressed long turn around times. With the heavy workloads in the state laboratories, being without standards for months is a severe hardship. Of even more serious concern, four responses detailed damage to mass standards during NIST calibration. Procedures at the primary laboratory must ensure protection of State standards. Three responses described measurement discrepancies in mass calibration values. These were detected either by ongoing historical measurement surveillance or through round robin participation.

Mass in the United States is defined by two platinum iridium kilogram weights housed at NIST. Every measurement States make depends on the ability of NIST to transfer the mass value of those kilograms to our weights. Without accuracy and known precision at this level, there is no way that we can guarantee our work. By design, the NIST mass group calibrates weights for very few customers. But, every customer that asks for a NIST traceable measurement from the State laboratories is a secondary customer of NIST. These measurements are used to verify the quantity or quality of virtually every product and service produced in the United States. In the State Laboratory Program, we owe much to the mass group and would appreciate the opportunity to work with them to support whatever improvements they need.

Railroad Issues

NCWM Chairman Elect, Steve Malone asked the Subcommittee to evaluate transfer of custody issues with railroad test cars, especially in situations where calibration of track scales is being subcontracted to private vendors. The subcommittee asked for and received help on this issue from Jim Ross (OR), Bob Wittenberger (MO), Vic Gerber (WY), and Bruce Adams (MN). Mr. Ross and Mr. Gerber supplied data that shows that a significant amount of money may be at stake, and that there is no quick, cheap fix. They feel that there has been potential for problems and contractual agreement could make it worse. Industry and GIPSA representatives have indicated willingness to work to identify the potential for error and solutions. They have also provided many years of "as found" test car and scale test data for analysis. Steve Malone suggested that this issue will require work from W&M inspectors, metrologists, GIPSA, and the railroad industry.

In addition to Mr. Malone's letter to the Subcommittee, Canada has requested that more formal mechanism be put in place to ensure traceability in the railroad test car calibration process. Round robin testing between the United States and Canada has been proposed. To address these issues, a meeting has been scheduled in Chicago, March 20-21, 1997. Representatives from GIPSA, the States, Canada, the railroads, and the major service contractors have been invited to attend. This issue will be pursued and reported to the Executive Committee during the NCWM annual meeting in July.

Handbook 130 Wording

Revisions had been drafted and circulated for the sections of the Uniform Weights and Measures Law and Voluntary Registration Regulation in NIST Handbook 130 that reference State Weights and Measures Laboratories to reference "NIST Accredited Laboratories." If adopted by NCWM, this would have allowed NVLAP accredited laboratories (such as Troemner, Southern California Edison, and Rice Lake) to provide class F weight certification for legal metrology applications. These revisions met with nearly unanimous approval. However, with the current proposal to stop OWM accreditation of the state laboratories, these revisions have been put on hold. The Subcommittee will revisit them when the accreditation issue is settled.

STR Viewpoint Response

Representing the subcommittee, L.F. Eason responded to Tom Stabler's November 1996, *STR Viewpoint* newsletter article entitled "Certification of State Laboratories." Ironically, much of this response referenced Tom's 1966 address to the 51st NCWM annual meeting. The subcommittee encourages Mr. Stabler to visit our upgraded laboratories and discuss any problems he perceives with the NCWM Metrology Subcommittee or the Office of Weights and Measures, before publicly condemning the program.

Proposals for Action

1. The Metrology Subcommittee encourages the Executive Committee to ask NIST management and OWM to clarify what the lack of accreditation means to the State Laboratory Program participants. How can the perceived discrepancy between OWM certifying the laboratories to be traceable and NVLAP refusing to accept this traceability be explained and resolved? What international quality requirements will be satisfied by OWM certification of traceability? These questions should be answered in a letter to all weights and measures directors and metrologists.

2. The Metrology Subcommittee requests that the NCWM Executive Committee support NIST in any initiative to:

   - Ensure that all NIST primary measurement laboratories (especially mass, volume, and length) have state-of-the-art facilities and equipment and meet ANSI/NCSL Z 540-1 requirements.
   - Ensure the implementation of a NVLAP-accredited quality assurance program for the NIST primary measurement laboratories.
   - Support the State Laboratory Program by adding technical personnel or contracts (or other measures as seen appropriate by OWM) to shorten review times, allow additional training opportunities, improve coordination between State Laboratory Program and the NIST basic measurement groups, and strengthen the program.

3. The Metrology Subcommittee requests that the Executive Committee encourage NIST management to arrange for the Metrology Subcommittee to have the opportunity to present State Laboratory Program participant concerns from the NCSL survey to the NIST Laboratory Council or other NIST staff in a position to take action on our concerns. The

Subcommittee welcomes the opportunity to work with the NIST basic measurement groups to identify and solve problems to our mutual benefit.

4. The Metrology Subcommittee requests that the Executive Committee continue to support the work of the weights and measures officials, metrologists, and railroad representatives from the United States and Canada, toward identification of problems and solutions concerning rail test car, master scale, and railroad track scale testing. After the scheduled meeting in March, we will report to the Executive Committee with further recommendations on how this can best be accomplished.

Metrology Subcommittee Report
July 1997

Lab Accreditation Issues - It's been a busy year.

A letter from Dr. Peter Heydemann dated January 8, 1997, stated that OWM could no longer accredit the State Laboratories. This letter also stated that NIST would not fund the NVLAP accreditation of SLP labs. The reason given for this decision was that "subsidizing the cost of accreditation is perceived as an 'unfair market advantage' to State laboratories." Much of the effort of the subcommittee has addressed this issue.

Activites and Developments Since the Interim Report

Meeting with Mr. Wil Able of Troemner

L.F. Eason met with Mr. Wil Abele from Troemner on April 14, 1997, in the North Carolina metrology lab. Mr. Abele stated that he felt that NIST OWM accreditation of the State laboratories created two tiers of accreditation within NIST and that the funding of accreditation gave the SLP labs an unfair competitive market advantage. Mr. Abele said that he and Mr. Tom Stabler had written and later met with Mr. David Edgerly of NIST to express their concerns. Mr. Eason and Mr. Abele agreed that there should not be two sources of accreditation from NIST, but Mr. Eason felt strongly that NVLAP accreditation of the SLP labs should be funded by NIST. Mr. Eason pointed out that most of the State labs ultimately answer to their State legislatures and most are told to provide a service to industry, in many cases as an incentive to attract new industries to their State and enhance the quality of their established industries. Therefore, most of the labs are not asked to be cost recuperative, much less forced to seek a profit. Mr. Eason suggested that if we were unfairly competing with his company, he should speak to our legislature, rather than NIST management. Also Mr. Eason expressed his concern that based on the NCWM workload survey, the SLP labs are testing many measurement standards across the Nation that there is no other convenient source for the service. Failure to fund the SLP NVLAP accreditation will fragment and decrease the uniformity of the program. Neither Mr. Eason nor Mr. Abele could see the other's point of view, but agreed that they should have a more open and honest dialog.

Meeting with Dr. Peter Heydemann and Dr. Gil Ugiansky

Dr. Peter Heydemann and Dr. Gil Ugiansky visited the North Carolina metrology laboratory on June 18th. They toured the lab and discussed how the laboratory serves industries in North Carolina. Mr. Eason presented material collected from the NCWM SLP Workload survey to show the National scope and volume of the work performed by the SLP and used this as an opportunity to discuss the need for NIST funding of SLP laboratory accreditation. Everyone agreed that the work done by SLP labs is critical to the dissemination of measurement standards and that NIST funding is important to the uniformity of the program. The areas of concern we were left with were finding the funds and resolving the question of NIST funding giving the SLP labs an unfair market advantage. There have been very few complaints that the state laboratories are unfairly competing relative to the number of companies the SLP labs serve. Also, there does not seem to be anybody else available to efficiently provide the service in most areas of the country, and to meet the mandate of the U.S. Constitution to fix the standards of weights and measures, therefore, the competition issue is not legitimate. Dr. Heydemann stated that he plans to question the industries we serve at the NCSL meeting in Atlanta to see if they agree.

Also, the metrologist in charge of the calibration lab at Glaxo Wellcome, the world's largest pharmaceutical company, discussed how the pharmaceutical industry uses the calibrations provided by the NC laboratory and why they need such a high level of accuracy.

Meeting with NIST Mass Group management - NCSL - USNMRC survey results

L. F. Eason and Ken Fraley discussed State Laboratory respondent results of the NCSL survey with the NIST mass group and their management in a meeting on May 20, 1997. The NIST mass group has made many improvements that respond to many of the survey concerns. These include environmental controls in the mass lab, a new high precision mass lab to house the national kilograms, the 1 kg mass comparator, and a new 10 kg mass comparator. This visit proved to be an excellent opportunity to explain to the mass group how the SLP diseminates NIST mass values across the United States through presentation of the NCWM workload survey information, stressing that every measurement we make

depends on their work. Though not all of questions were answered, much progress was made and will continue to be made thanks to the new lines of communication that have opened.

Railroad update

Georgia Harris organized a meeting of government and industry officials from the United States and Canada in Chicago, March 20-21, 1997. Georgia reported on that meeting during the NCWM Monday afternoon railroad forum.

NCWM SLP workload survey results

L.F. Eason summarized the results of the NCWM SLP workload survey to the Executive committee on Sunday afternoon and to the NCWM during the Tuesday General Technical session on laboratory accreditation. A final report will be completed and published this year. The following highlights of the data were presented:

- SLP laboratories serve 19,393 customers
- SLP laboratories test 339,054 measurement standards each year
- Only 51percent is W&M related. Yet this part of the SLP workload is estimated to effect $4.13 trillion of the 1996 $7.57 trillion U.S. Gross Domestic Product.
- The other 49 percent of the SLP workload affects virtually all of the remainder of the GDP. The quality, efficiency, safety, and competitiveness of US industrial production depends on these measurements.
- 189 scale companies questioned across the United States reported an average of 63 percent of their work affected commercial regulatory scales. They use the same weights for both. There is no way to separate commercial W&M from industrial.

Budget Issues

The subcommittee appreciates the Executive committee decision to fund a representative from the subcommittee attending the Interim meeting to present a report and answer questions.

An amended budget request was presented to the executive committee requesting the funding of travel expenses for an annual NCWM metrology subcommittee and NIST management meeting for the Chair of the Metrology Subcommittee and up to two other State metrologists. The NCWM representatives would meet with representatives from NIST Technology Services (OWM and the Calibration Program), Manufacturing Engineering (mass, force, and dimensional), and Chemical Sciences Technology (fluid flow, volume, and temperature). This meeting would continue and expand the communication between the State Laboratory Program labs and the NIST basic measurement groups that was initiated during the May 20, 1997, meeting described above.

Updated Support Proposals

- Encourage NIST to provide accreditation for the State laboratories at no cost. This is necessary since the State laboratories are an integral part of the National Measurement System.

- The Metrology Subcommittee requests that the NCWM Executive Committee express its support of the ongoing NIST initiatives to:

  - Maintain the state-of-the art capabilities, facilities, and equipment of the NIST primary measurement laboratories (especially, mass, volume, and length) consistent with international requirements.

  - Support the State Laboratory Program with improved document review time, training, and coordination between the SLP and the NIST measurement groups.

  - Provide opportunity for the Metrology Subcommittee to express its concerns and work with NIST to help identify and solve mutual problems.

- The Metrology Subcommittee requests that the Executive Committee continue to support the work of the weights and measures officials, metrologists, and railroad representatives from the United States and Canada, toward identification of problems and solutions concerning rail test car, master scale, and railroad track scale testing.

Appendix J - NTEP Participating Laboratories Report

Participating Laboratories Evaluation						July 3, 1997
All Labs	1995	1995	1996	01/01/97 - 06/30/97		
				Total	TEs	Updates
Requests Assigned[1]	364	395	502	225	175	50
US Mutual Recognition Requests Assigned	21	40	67	38	37	1
Certificates Effective[2]	68	21	109	71	35	36
Certificates Issued	164	188	322	163	111	52
Average Time (wks) to Perform Activities for Successful[3] Type Evaluations						
	TEs: (CCs Issued 1994)	TEs: (CCs Issued 1995)	TEs: (CCs Issued 1996)		TEs: (CCs Issued 1 - 06/30/97)	Updates: (CCs Issued 1 - 06/30/97)
"Date Assigned" to "Equipment Received"	7	7	7		8	
"Equipment Received" to "Type Evaluation Complete"	6	7	5		5	
"Type Evaluation Complete" to "CC Effective"	4	1	3		2	
"CC Effective" to "Draft Certificate To NIST"	4	11	10		8	
"Draft Certificate To NIST" to "Certificate Issued"	6	10	9		9	7
"Date Assigned" to "Certificate Issued"[4]	23	25	26		33	21

Activity	CA	MD	NY	OH	NIST	OTHER	TOTAL
Number of Requests Assigned[1]							
1994	103	39	32	73	93	24	364
1995	64.5	68	44.5	75.5	142.5	22	395
1996	87	91	39	98	152	35	502
1997 (01/01/97 - 06/30/97)	36	26	20	61	66	16	225
Number of Certificates Effective[2]							
1994	14	4	2	23	22	3	68
1995	2	5	3	--	8	3	21
1996	14	11	4	20	43	22	109
1997 (01/01/97 - 06/30/97)	6	8	5	14	35.5	2.5	71
Number of Certificates Issued							
1994	42	4	19	21	71	2	164
1995	37	7.5	8.5	36	89.5	9.5	188
1996	61	19	18	73	132	19	322
1997 (01/01/97 - 06/30/97)	19	11	9.5	42.5	65	16	163

[1] Beginning in 1994, if a device fails a type evaluation, it is then entered as a new request for a new type evaluation. Previous to 1994, multiple failures of the same device were still considered as a single type evaluation.

[2] "Effective" means the type evaluation is complete but the certificate has not yet been issued.

[3] "Successful" means the type evaluation did not fail at any stage.

[4] Individual stages of type evaluation will not equal total for complete process due to intermediate rounding.

Appendix K

National Type Evaluation Technical Committee
Weighing Sector
Meeting November 14-15, 1996

Summary of Decisions

1) Hopper Scale Criteria

Conclusion: The Sector agreed that the policy of evaluating hopper understructure for use with varying types of load receiving elements should be continued.

The Sector developed guidelines to address various parameters of hopper scales on Certificates of Conformance (CC). The Sector agreed to add a new section 6 as follows to Section **B Certificate of Conformance Parameters** of the **NTEP Technical Policy for Scales** of NCWM Publication 14, and renumber the current section **6. Platform Material** section under Section B. to address ranges of capacities, sizes, etc. of hopper scales.:

6. Weighing Systems Utilizing a Tank or Hopper Load Receiving Element.

A CC will apply to all models having:

a. For a cylindrical cone bottom tank or hopper:

1. weighing **capacities** from 20% to 125% (approximately a 6:1 ratio) of the evaluated **capacity**;

2. tank or hopper **height** from 50 percent to 125 percent of the **height** of the evaluated device;

3. tank or hopper **diameter** from 50 percent to 110 percent of the **diameter** of the evaluated device;

4. **platform construction and materials** similar to that of the equipment evaluated; (see also section titled "Platform Material" below);

5. **scale division** values equal to or greater than the value of the **scale division** used in the scale evaluated;

6. $\mathbf{n_{max}}$ equal to or less than the value of the $\mathbf{n_{max}}$ used in the scale evaluated;

b. For a rectangular tank or hopper:

1. weighing **capacities** from 20 percent to 125 percent (approximately a 6:1 ratio) of the evaluated **capacity**;

2. tank or hopper **height** from 50 percent to 125 percent of the **height** of the evaluated device;

3. tank or hopper **length** from 50 percent to 110 percent of the **length** of the evaluated device;

4. tank or hopper **width** from 50 percent to 110 percent of the **width** of the evaluated device;

5. **platform construction and materials** similar to that of the equipment evaluated; (see also section titled "Platform Material" below);

6. **scale division** values equal to or greater than the value of the **scale division** used in the scale evaluated;

7. $\mathbf{n_{max}}$ equal to or less than the value of the $\mathbf{n_{max}}$ used in the scale evaluated.

The Sector agreed that tests can be conducted at the manufacturer's facilities using test weights.

To ensure consistency in testing levels during the permanence test period, the Sector agreed that the following language should be inserted into an appropriate section of Publication 14.

Permanence Test Use Requirements for Hopper Scales

A minimum of 300 weighing operations are required during the test period. The manufacturer is to log the date, time, and weight. Each entry is to be initialed by the person conducting the weighing.

Only loads which have been applied using a method representative of the scales intended use can be counted.[1]

Test loads

50 percent of the loads must be above 50 percent of the scale capacity; and,

100 percent of the loads must be above 20 percent of the scale capacity.

The minimum number of days that a device is required to be in use is 20. A minimum number of weighing operations to be conducted each day for the test period is not specified; however, the weighments should be representative of the scale's normal in-service use.

[1]The scale may be used to weigh other loads, but only the loads identified are counted as part of the permanence test.

2) Permanence of ID Badges on Load Cells

Conclusion: The Sector agreed that the permanence requirements for identification badges on scales should also be applied to load cells and included in the load cell checklist. The Sector asked that this permanence criteria be presented to the other NTEP sectors to encourage adoption of the same criteria for all devices.

The Sector examined the use of the term "badge" as it is defined in the Handbook 44. Since the definition appears to be oriented toward liquid-measuring devices (LMD), the Sector agreed that the S&T Committee should be asked to clarify the specific meaning of the term "badge" as it relates to weighing devices. If the term badge is specific to LMD, the Scales Checklist of Publication 14, where the term "badge" is used, should be modified to remove any confusion.

3) Evaluation of Tare Features

Conclusion: Comments were heard suggesting that the issues seem to have been addressed by the latest revisions to the checklist. The NTEP laboratories will continue to work with Publication 14 as it is now written and return to the Sector if there are any problems.

4) Modification of Type

a) Dump Option

Conclusion: The Sector heard arguments for and against for allowing the modification of an NTEP approved scale with a dumping mechanism without additional testing. Some believed that this would be considered a modification of type and needed additional testing; others were unsure what effect, if any, this would have on the scales performance; and, still others believed that this was not

a modification of type and should be allowed. No clear agreement or disagreement was reached in the discussion. The Sector may want to revisit this at a later date. The Sector also asked for input from Scale Manufacturers Association's (SMA) Technical Committee.

b) Replacement of Concrete Decks with New Steel Decks

Conclusion: The Sector agreed that changing deck material (for example, concrete vs. steel) on a scale is a modification of type ***in some designs of scales*** and, in those designs, both types of decks would have to be tested to include both types on the Certificate of Conformance. The Sector noted that there are some designs where replacement of the deck material would not affect the performance of the scale.

The Sector agreed to modify Part 6. Platform Material (pp. 1-12, NCWM Publication 14, 4th edition, May 1996) as follows:

> **6. Platform Material**
>
> In the case of a weighbridge design where the deck is integrated into the weighbridge so as to be structurally significant, both. ~~C~~concrete and steel decks must be tested separately in order to cover both options on an NTEP Certificate of Conformance; full NTEP tests are required on both options unless NTEP decides otherwise. A composite scale consisting of a minimum of two decks, (i.e., two spans), one span deck being of steel construction and the other of concrete may be submitted and tested to include both types of decks. Concrete-deck and steel-deck scales should be marked with unique model designations to indicate the difference in platform material.

The Sector agreed that examples are needed to describe how these criteria would be applied to ensure that the criteria are applied uniformly to all device designs. Representatives from SMA's technical committee agreed to take the issue to their meeting during the week of November 19-23, 1996, and develop examples for applying the criteria along with diagrams. A letter ballot will be distributed to the Sector for agreement on including the examples in the next edition of Publication 14.

c) **Replacing a Lever System with Load Cells**

Conclusion: The Sector maintained its position that changing from a lever system scale to a full electronic scale is a modification of type and would require a complete NTEP evaluation.

The Sector agreed that going from mechanical to electro-mechanical (e.g. installation of a load cell into a steelyard rod) is not a modification of type and the electro-mechanical version can be covered on the CC without additional testing.

d) **Conversion of Vehicle Scales to Livestock Scales**

Conclusion: There were some concerns raised over whether or not the criteria in the checklist that addresses livestock scales should be reviewed before recognizing a livestock application on a CC. In addition there was some question over whether or not the CC should be modified to reflect the specific vehicle vs. livestock applications.

Based upon comments from Paul Peterson, GIPSA, the Sector concluded that there were differences between the two types of applications, especially with the digital indicator portion of the checklist. Therefore, if a manufacturer wants to use a vehicle scale as a livestock scale: (1) the request must be on the application when it is submitted for type evaluation, (2) the evaluation needs to include evaluation for livestock scales, and (3) the application as a livestock scale must be list on the CC.

e) **Other Modifications?**

Conclusion: Some examples of changes in material (e.g., carbon steel vs. stainless steel) were discussed and how NTEP laboratories would handle these changes. The Sector agreed that discussions need to take place between NTEP, NIST, and the manufacturers for specific examples of modifications and how they should be handled. The Sector asked that the NTEP laboratories meet to establish a standard operating procedure for addressing such modifications and applying them consistently.

5) Test Procedures for Railroad Scales

Conclusion: The Sector agreed to the following changes to page 1-89 of the Scales Checklist to clarify the procedures to be used for the testing of in-motion scales and the modes that could be covered on a Certificate based upon a specific test:

> In the past, a ten car/ten time test was the standard. Now the type of test will vary on how the user intends to use the scale. When testing for type approval, the normal train length should not be exceeded as the performance of the system may be compromised by track conditions outside of the normal weigh track. The minimum test will normally be no less than 10 cars run over the scale five times in each mode of operation unless the type evaluation laboratory determines that "as-used" test procedures are warranted by the site conditions. If "as-used" test procedures are used, tests are performed in a manner that represents the normal method of operation and length(s) of trains normally weighed. In this case, the weighing systems may be tested using either a consecutive-car test train or a distributed-car test train of a length typical of the train(s) normally weighed.
>
> The test types are generally referred to as modes. Modes consist of four variables: unit train or individual car accuracy; loads or empties; pushing or pulling; and one or both directions. With all combinations, this could result in sixteen independent tests of one scale system. With practical combinations, there are often four or less tests to run. Typically, a test will be two modes such as pushing empties and pulling loads.
>
> If empty and loaded cars are to be covered on the Certificate of Conformance, testing must be performed with both empty and loaded cars; use of a train with both empty and loaded cars mixed in the train would also serve to cover both empty and loaded modes. If both pushing and pulling modes are to be covered on the Certificate of Conformance, testing must be performed both pushing and pulling cars. Both one and two direction weighing can be covered on a Certificate based upon testing of the scale used in one or two directions.

The Sector also agreed that clarification was needed for establishing the minimum criteria for conducting the strain load tests on static railway track scales, and noted that the procedures should include differentiation between two-module and full length design. Lou Cerny, Association of American Railroads (AAR) and Bob Brumbaugh, System Associates, Inc. (SAI) , agreed to approach AAR and ask for input on the criteria and bring back suggested clarifications to the Sector.

6) Clarification of Applying 0.7 Tolerances

Conclusion: The Sector reviewed three issues related to the proper application of tolerances to components:

a) Should the 0.7 percent tolerance be applied to all phases of the testing of a component, including the laboratory test and the permanence test?

b) Should the 0.7 tolerance apply in the manufacturer's facility when the test is conducted in a laboratory environment?

c) If a weighing element uses a digital load cell, should this change the tolerance (0.7 vs. 1.0) applied to the device?

The Sector did not reach an agreement on responses to all of the scenarios. The Sector did agree that the 0.7 tolerance should apply for laboratory tests of components, both for influence factors testing and permanence testing, and that the current criteria on Page 1-7, which includes the following statement, is appropriate:

> When main elements (indicating elements and weighing/load receiving elements) are tested separately, the tolerance applied to all laboratory tests (influence factors and permanence tests) are 0.7 times the acceptance tolerance for complete scales.

The Sector asked that the NTEP laboratories to discuss this issue further, and, if there is concern that the wording is not appropriate, then the labs should come back to the Sector to propose changes to the language.

In its discussion of issue (6c above), the Sector agreed to the following conditions concerning the replacement of an analog load cell with a digital load cell:

In a system with multiple analog load cells, the replacement of a single cell with an approved and compatible digital load cell is not a metrologically equivalent replacement. The replacement of all analog load cells in the system with approved and compatible digital load cells is considered a metrologically equivalent replacement.

7) Printing Calibration Values

Conclusion: The Sector agreed that an indicator should not print information that could be construed as valid weight information when in the modes noted in Scales Checklist Section 11.10. The Sector discussed the possible need to be more general in Publication 14 checklist items rather than giving specific examples; however, it was noted that the NTEP laboratories find examples helpful to ensure consistent application of the criteria. In addition, the Sector has already specifically addressed other items and included examples in the checklist for the benefit of consistent interpretation.

Add the following text in place of the current 11.10:

When the following is displayed by an indicator (or a video display terminal getting weight values from a separate primary indicator) the device shall either:

(a) not print; or

(b) provide a clear and continuous indication on the printed representations that the displayed value is other than a valid weight representation.

~~An indicator shall not print, and a video display terminal getting weight values from a separate primary indicator shall not indicate, when the following information is displayed by the indicator:~~

1. dead-load verification values;
2. electronic recalibration values ~~other test values~~;
3. electronic display verification sequences; or,
4. other test values.

8) Letter Ballot on "n_{max} of Load Cells in Complete Scales"

Conclusion: There were no further comments on the letter ballot from the Sector.

9) Test Procedures for Livestock Scales

Conclusion: The Sector agreed to modify section 63 of the Scales Checklist as follows to specify test criteria for livestock scales including increasing and decreasing load tests, return to zero, and permanence criteria:

63. ~~Shift~~ Performance and Permanence Tests for Livestock Scales

Initial Type Evaluation (Field) Performance Tests

Performance tests are conducted to determine compliance with the tolerance and, in the case of nonautomatic indicating scales, sensitivity requirements specified in NIST Handbook 44. The tests described here apply only to the weighing element. It is assumed that the indicating element used during the test has already been examined and found to comply with the applicable requirements. If the performance of the indicating element is to be determined during the same examination, the applicable requirements for weighbeams and poises, dials, electronic digital indicators, etc., must be referenced. If the indicating element is a digital indicator, width-of-zero tests, zone of uncertainty tests, discrimination tests, and appropriate tests for the automatic zero-setting mechanism (if so equipped) should be conducted as indicated in other sections of this publication. Also, Section 35 entitled Livestock and Animal Scale Systems provides specific interpretations of NIST Handbook 44 applicable to animal and livestock auction scales.

63.1. Increasing and Decreasing Load and Shift Tests: Livestock seek a corner of the scale platform or, in the case of multiple head weighments, bunch up on one of the end sections. It is preferable to perform a corner test on 2 section livestock scales and a section test on livestock scales with more than 2 sections. Corner and/or section tests shall be conducted in accordance with the procedures described below.

~~63.2~~

63.1.1. Livestock scales with ~~1 or~~ 2 sections:

~~63.2.1. Using ½ capacity test loads in separate tests, place the load in the center of each quarter section of the load receiving element and/or~~

~~63.2.2. Using 1/4 capacity test loads, place the load in the center, as nearly as possible, successively over each main load support~~

63.1.1.1 Conduct two sets of increasing load and shift tests over each corner at 1/4 the nominal capacity of the scale. ~~For the first set, perform this test on each corner, and check zero balance before going on to the next corner. For the second set, complete the increasing load build up on one corner and move the weights to the next corner without unloading the scale.~~ Take several readings as the weights are being removed. When all the weights are removed, record the return to zero. The scale must return to zero within one-half of a scale division. When analyzing the return to zero, consideration must be given for the length of time the load was on the scale and for possible temperature changes that may have occurred during the test. Next, conduct an increasing load test to the scale nominal capacity or at least to the used capacity by distributing the test load over the platform in at least five equal intervals and record the error for each interval. Be careful not to exceed the CLC of a section when loading the weights. Record decreasing load indications as you remove weights from the platform in at least five equal intervals.

~~63.1.~~

63.1.2. Livestock scales with more than 2 sections: ~~A shift test shall be conducted with at least two different test loads and may be performed anywhere on the load-receiving element using the prescribed test pattern and maximum test load specified below:~~

~~63.1.1.~~

63.1.2.1. If the ~~CLC~~ **capacity** of the scale does not equal or exceed 110 lb per square foot, the scale is not suitable for weighing livestock (ref: Packers & Stockyards formula for determining the used capacity of Livestock scales).

At least two complete sets of shift tests shall be conducted over each section ~~to at least 90 percent of the concentrated load capacity (CLC) of the scale.~~ This is to determine the repeatability of the scale. ~~The scale error should be determined at a minimum of five equally spaced test loads.~~ Each set must include determination of error at a minimum of five ~~equal~~ intervals of test loads up to 90 percent of the CLC repeated over each section. ~~For the first set, perform this test on each section, unloading the weights and checking zero balance before going on to the next section. For the second set, complete the increasing load build up on one section and move the weights to the next section without unloading the scale.~~ Take several readings as the weights are being removed. When all the weights are removed, record the return to zero. The scale must return to zero within one-half of a scale division. When analyzing the return to zero, consideration must be given for the length of time the load was on the scale and for possible temperature changes that may have occurred during the test. Scale errors may be determined at more points if desired. ~~If two weight~~

~~carts are used, they should travel along the paths the wheels of a vehicle would take when moving across the scale.~~ Decreasing load tests are to be avoided when testing a section. ~~A truck may not be backed onto the scale in order to place weights on the inner sections.~~ Next, conduct an increasing load test to the scale nominal capacity or at least to the used capacity by distributing the test load over the platform in at least five intervals and record the error for each interval. Be careful not to exceed the CLC of a section when loading the weights and distribute loads across the section. Record decreasing load indications as you remove weights from the platform in at least five intervals. Decreasing load tests shall be conducted after the sections have been tested to their maximum load and the weights are being removed from the scale. ~~The load is to be distributed across the section.~~

NOTE: Decreasing load tests are only applicable to automatic indicating devices.

~~63.1.2.~~

63.1.2.2. At least one complete set of shift tests to at least 90 percent of the CLC shall be conducted at midspan between sections.

~~63.1.3.~~

63.1.2.3. If a scale consists of modules that are connected together to comprise the weighbridge, shift tests shall be conducted by placing the load so that it straddles the connection between the modules. Later, at least one shift test is to be conducted on the scale with the test load ~~is~~ placed first on one side of the connection line ~~off~~ of the module, then on the other side of the connection line.

~~63.1.4.~~

63.1.2.4. The results of shift tests are required to agree within the absolute value of the applicable maintenance tolerances and must be within acceptance tolerances.

63.2 Subsequent Type Evaluation Permanence Test

63.2.1 The device must be tested in the same manner as described in section 63.1 with the exception that only one set of section or shift tests is required and the test weights need not be unloaded from the scale before moving to the next section. The requirements for the increasing and decreasing load tests remain the same as described in section 63.1.

63.2.2 The time between the initial field performance test and the subsequent field test will be 20-30 days. Performance during both tests must be within acceptance tolerances.

63.2.3 If a device fails subsequent permanence tests, the entire permanence test must be repeated.

63.3 Permanence Test Use Requirements

See Sections 64.7.1., 64.7.2., 64.7.4., 64.7.5 and 64.7.6

63.4 Motion Detection Tests

63.4.1 Perform a test of the motion detection circuitry as described in Section 50, Motion Detection. Livestock scales are unique in that their loads are alive and moving on the scale platform during weighing. Therefore, the motion detection function of the scale

is a critical element in obtaining a correct weight. Testing motion detection with a static load and inducing motion as describe in Section 50, either manually or electronically, may be the only available or practical method at a given situation and time. However, the best method to check motion detection on a livestock scale is to use livestock that are kept moving on the scale which will provide a test incorporating the dynamics for which the system was designed to be used. Please contact the Packers & Stockyards Program (P&SP), Scales & Weighing Branch at 202-720-3140 for assistance and detailed instructions regarding dynamic testing of livestock scales.

63.4.2 The Packers & Stockyards Program recommends that a delayed print function not be incorporated into a livestock weighing system because the weighmaster would not always be able to obtain the most accurate weight when motion detection delays the print. P&SP prefers that immediate printing be available to the weighmaster in order that he/she is able to capture the most accurate weight. Of course, immediate printing will not occur when the motion detection circuit detects motion and the print button would then have to be reactivated when the weighmaster, again, attempts to select the most accurate weight.

It was agreed that the NTEP laboratories would work with the checklist criteria over the next year and report back to the Sector on how well it works. The Sector briefly discussed deleting the return to zero test between corners on 63.1.1.1. based upon comments that the additional return-to-zero test may not be necessary and not always practical; however, it was agreed to try the test procedures for a while before making this decision.

10) Software Working Group Update

Background/Conclusion: Mike Adams, Fairbanks Scales, and Steve Cook, CA Division of Measurement Standards, updated the Sector on the work of Software Work Group. They reported that a draft letter has been prepared and is being circulated among the work group to respond to the NTEP Board of Governors' question of why CCs should be issued to software; once the letter is finalized, it will be sent to the Board of Governors. The Southern Weights and Measures Association (SWMA) passed a resolution to discontinue issuing NTEP CCs until the NCWM has reached a position on this issue. Currently, there is disagreement amongst the Executive Committee as to how the issue of software should be handled.

11) Automatic Weighing Systems (AWS) Update

Background/Conclusion: An update was given to the Sector on progress of the Work Group which last met in June 1996. A proposal was made by the Work Group to address future AWS issues as part of the Weighing Sector regular meetings rather than as part of a separate group meeting. The Weighing Sector agreed with this position and, consequently, future AWS issues are to be presented to the Weighing Sector.

12) Multiple Dimension Measuring Devices (MD^2) Workgroup Update

Background/Conclusion: An update was given on the progress of the Work Group. An informal industry meeting was held in July 1996 to review draft type evaluation procedure criteria. The type evaluation test procedures were also circulated to the work group and comments submitted to NIST at the end of July. It was noted that, early on, the draft requirements for OIML and the US were very similar; however, since the last OIML International Work Group meeting some direct conflicts have been created between the OIML draft and the tentative NIST Handbook 44 code.

The Sector agreed that participation and representation of the US (Handbook 44) position is important. While individual companies have representation on both, the OIML Committee and the NCWM Multiple Dimension Measuring Device (MD^2) Work Group, these members represent their own companies rather than a group position. Otto Warnloff, NIST, had been chair of the U. S. National Working Group until his retirement this year. The Sector felt that this leaves a void which needs to be filled. In the past, a government person had always filled this position. It was noted that discussions are currently underway with NIST management. Tina Butcher, NIST/OWM noted that this does not necessarily ensure representation of the NCWM position. If the Sector feels that NCWM representation on the International Working Group is important, this feedback should be presented to the Executive Committee along with an indication of its relative priority to other weighing-related NCWM work.

13) United States/Canadian (US/CD) Mutual Recognition Status

Background/Conclusion: The Sector was updated on progress in the area of US/CD Mutual Recognition.

Canada's Legal Metrology Branch (LMB) is in the process of revising their requirements for scales, and the new requirements may be effective by March 1997. LMB has received approval from the Privy Council to publish the specifications for comments (60 days). If no comments or objections are received, the specifications will be published in part 2 of the Canada Gazette for adoption.

In June 1996, representatives from the Canadian's Legal Metrology Branch (LMB) and the NTEP Laboratories met in Annapolis, MD at the Maryland Department of Agriculture Laboratory for a joint training session where the Canadian representatives provided training in the new requirements. The laboratories will continue to apply the current requirements until notified by LMB that the new requirements have been adopted.

The group also finalized plans to expand the current scope of the US/CD Mutual Recognition Program for scales. Early in September, the program was expanded to include mechanical scales up to 10 000 kg (20 000 lb), computing scales up to 1000 kg (2000 lb), and complex indicators excluding those that are software-based. Both laboratories agreed that the meeting last June was extremely beneficial.

There has been no discussion to further expand the program, though is was noted that mutual recognition of load cell testing is probably the next logical step. Both U.S. and CD laboratory representatives noted that there is a lot of work required to maintain this program even at the current level.

Along this line, it was noted that the Executive Committee has undertaken a strategic planning process. It would be beneficial for the Sector to provide feedback to the Executive Committee on how high a priority the Sector places on this work. The Executive Committee is faced with prioritizing the various NCWM projects and needs input on what projects are most important to members and where resources should be concentrated.

14) NTEP issuance of R60 and R76 OIML Certificates and Mutual Recognition Work

Background/Conclusion: The Sector was updated as follows on work in the area of mutual recognition agreements for R60 and R76 and also on the progress of NTEP's preparations for issuing OIML Certificates for R60 and R76.

Mutual Recognition Agreements with Other Countries' Laboratories.
At the January 1996 NCWM Interim Meeting, NIST's upper management raised questions concerning NIST OWM's involvement in mutual recognition agreements with other countries as related to NIST and U.S. Government policy. The Scale Manufacturer's Association has been working with NIST upper management to address these concerns, and a position paper on the subject from the NIST Office of Technology Services is being finalized. It was noted that the concerns raised seemed to stem from the use of the term "mutual recognition agreement" as it is used in U.S. Government circles.

NTEP Issuance of OIML Certificates for R60 Load Cells.
The NIST Force Group and OWM have worked with a contractor to develop a program to automate the collection of data from tests of load cells to R60 requirements. This program is similar to the automated program used for generating test reports from NTEP tests of load cells. The program generates a report in the format of R60 Annex A. The program is in the final phases of testing, and revisions are being made based upon comments received on the report thus far. OWM has also developed a macro for generating a U.S./OIML Certificate for R60 Load Cells.

Currently, California Division of Measurement Standards does not have an automated process for generating test reports for NTEP tests of load cells. However, OWM has developed a macro which can be used to generate the R60 Annex A based upon manual input of data. Additional work, training, and, possibly, equipment will be needed to prepare California for testing to R60 requirements.

Tina Butcher, NIST OWM, Manager National Type Evaluation Program, will meet with Sam Chappell, NIST Technical Standards Activities Program, U.S. Representative to OIML, to ask that the Annex A test report and OIML Certificate be reviewed for consistency with the OIML Certificate System for Measuring Instruments; also to be discussed is the technical support available for responding to technical questions on R60 from the U.S. evaluating laboratories. A meeting is also planned with the NIST Budget Office to obtain authorization to bill for work done on OIML Certificates. NIST OWM will be coordinating revisions to the NTEP database to accommodate the tracking of OIML project numbers and Certificate numbers.

It is anticipated that NTEP will be able to offer OIML R60 testing by the NIST Force Group by the end of 1996. OIML testing of lower capacity cells by California will be added at a later date once training and equipment requirements have been satisfied and the process for issuing OIML Certificates has been implemented.

NTEP Issuance for OIML R76 Non-Automatic Weighing Instruments.
In preparation for issuing OIML Certificates for R76, the California and Ohio laboratories are participating in a round robin coordinated by the Asia Pacific Legal Metrology Forum. A non-automatic weighing instrument is being circulated among participating laboratories for testing to R76 requirements. The NTEP Board of Governors authorized an expenditure of $5,000 to cover the fees of outside laboratories contracted to perform electrical tests which cannot be performed by the NTEP laboratories; the two laboratories participating in the round robin are providing their laboratory staff services at no charge. This effort should prove to be valuable experience for the two NTEP laboratories in this area of testing.

15) Administrative Issues

Conclusion: As past Chairman of the NTEP Board of Governors (BOG), Jim Truex, Ohio Weights and Measures, updated the Sector on the BOG's discussions on NTETC administrative issues. Discussions included size of the sectors, balance of public and private members, voting status, etc. The Board did not want to dictate term lengths for members. The Board did say that NIST has only one vote, each state has only one vote, and each company only has one vote; it is up to the organization or company to decide who is the voting member. NCWM members interested in becoming a member of the Committee must ask that the NCWM chairman to be appointed. Manufacturers cannot also automatically appoint new members from their company; individuals are appointed, not companies.

16) Change in NTEP Administrative Fee Structures

Conclusion: The Sector was updated on the changes in the NTEP administrative fee structure. Copies of a memorandum distributed in July when the fee structure was changed were mailed to Sector members with the attachments for this meeting. Sector members were advised that a purchase order number for the application fee would be accepted to initiate processing of the application; the latest complete edition of Publication 14 (which was published in May 1996 before the fee structure was changed) does not note that a purchase order number can be accepted; however, the individual checklists have been revised to provide for a purchase order number.

17) Review of Changes to Publication 14 to Reflect July 1996 NCWM Changes to NIST Handbook 44

Conclusion: The Sector reviewed and agreed to the following proposed changes to Publication 14 based upon changes made by the NCWM to Handbook 44 in July 1996. No additional comments were received on this issue.

a.) Concentrated Load Capacity; Declaration of Other Than Dual-Axle Configurations
Code Reference: UR.3.2.1

Add UR.3.2.1. and the accompany Table (See Appendix A) to NCWM Publication 14 as follows to enable the type evaluation laboratory to assess the appropriateness of the markings.

> **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.**

b.) Relationship of v_{min} to d
Code Reference: S.5.4

Amend Section 22 of the Scales Checklist, Section S.5.4. Relationship of Load Cell Verification Interval Value to the Scale Division, as follows:

22. Relationship of v_{min} to d

Code Reference: S.5.4.

If the scale uses an NTEP load cell, the load cell verification interval must satisfy one of the following relationships (When the value of the scale division, d, is different than the verification scale division, e, for the scale, the value of e must be used in the formula below.)

22.1. $v_{min} \leq \frac{d}{\sqrt{N}}$ where N is the number of load cells in the scale without lever systems

22.2. $v_{min} \leq \frac{d}{\sqrt{N} \times (\text{scale multiple})}$ for scales with lever systems.

This requirement does not apply to complete scales and weighing elements which satisfy the following criteria:

(1) The device has been evaluated for compliance with T.N.8.1. Temperature under the National Type Evaluation Program (NTEP);

(2) The device has received an NTEP Certificate of Conformance; and

(3) The device must be equipped with an automatic zero-setting mechanism which cannot be made inoperative in the normal weighing mode. (A test mode which permits the disabling of the automatic zero-setting mechanism is permissible, provided the scale cannot function normally while in this mode.)

18) Operation of the Repeat Key

Conclusion: The Sector felt that this issue would best be addressed first by the NTEP Laboratories to determine whether or not there is a problem with the existing language. If the laboratories feel after discussion that changes are needed to the checklist, they are asked to submit a proposal to the Sector.

19) Model Designation for Weight Classifiers

Conclusion: The Sector believes that NTEP's interpretation is appropriate at the present time; a separate model designation should not be required to differentiate weight classifiers from non-weight classifiers, but the device must be appropriately marked as required for special applications. The Sector acknowledged the concerns of having a device set up in the field and used inappropriately in a weight classifying mode. Several suggestions were made for possible future Handbook 44 requirements which would automatically ensure that the device is identified as a weight classifier in the final setup. It was suggested that this might also be an issue that the Scale Manufacturer's Technical Committee could review and develop a proposal to address. Concern was also expressed over whether or not the field official can perform an adequate test to determine that a device is in a weight classifying mode.

20) Requirements for Power Loss

Part A: "Voluntary" vs "Involuntary" Power Loss

Conclusion: The Sector agreed that the original intent of "power loss" was not intended to allow the user to selectively interrupt communication for the purposes of circumventing the requirement which prohibits use of manual weight entries on vehicle scales. It was also agreed that the phrase "loss of communication" and "power loss" or "loss of power" do not have the same meaning. It was acknowledged by the Sector that Handbook 44 prohibits the use of manual weight entries on vehicle scales; however, the Sector could not reach a conclusion on what changes, if any, were needed to the existing language. Some concerns were expressed that the manual weight feature should not be allowed in software for vehicle scale systems at all. It was noted, however, that like a typewriter, if the computer system is not connected to the scale, the computer is no longer part of the weighing system. The NTEP laboratories agreed to discuss this issue further to see if they might be able to develop a recommendation for addressing these concerns.

Part B: Entries of Tare
Part B of this item had to do with entries of tare when power loss occurs. Due to time constraints this item was not considered by the Sector.

21) Self-Checkout Scale Systems

Conclusion: The Sector agreed that the systems would be subject to type evaluation. The criteria to be applied would be the same as in the checklist for ECR's interfaced with scales combined with facilitation of fraud criteria. The Sector agreed that, if a video display were the primary indicator, it would not have to be tested for influence factors requirements unless the A/D convertor were located in the display.

22) Provisional Certificates — Wheel Load Weighers

Conclusion: The Sector agreed that issuance of provisional CCs for wheel load weighers and portable axle load weighers is still appropriate. However, should they elect to do so, manufacturers should be able to get a full CC by following the policy stated under Section ***4. Influence Factors Testing of Larger Scales Not Using NTEP Load Cells (and the Load Cells Cannot be Tested Separately)*** of Publication 14 (pp. 1-10 of the 1996 edition of Publication 14).

It was agreed that the wording in the policy be changed to reflect these positions. The wording will be modified as follows:

> **4. Influence Factors Testing of Larger Scales Not Using NTEP Load Cells (and the Load Cells Cannot be Tested Separately)**
>
> In November 1996, the Weighing Sector agreed that wheel load weighers and portable axle load scales which are not equipped with NTEP approved load cells and which do not lend themselves to being tested in NTEP environmental chambers would not be required to comply with the following policy; these devices may continue to receive provisional Certificates of Conformance based upon influence factor data collected by the manufacturer and testing performed by an NTEP laboratory. However, should a manufacturer of such a device wish to obtain a full Certificate of Conformance, the policy outlined below can be followed to satisfy the influence factors requirements to obtain a full Certificate.
>
> In December 1992 the ~~Technical Committee~~ Weighing Sector voted and established the following technical policy for devices which are not equipped with NTEP approved load cells and which do not lend themselves to being tested in NTEP environmental chambers, (e.g., some ~~wheel load weighers and~~ crane scales).

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Appendix A to Weighing Sector Meeting Summary

Table UR.3.2.1
Span Maximum Load

Distance in feet between the extremes of any group of 2 or more consecutive axles	Ratio of CLC to maximum load ("r" factor) carried on any group of 2 or more consecutive axles							
	2 axles	3 axles	4 axles	5 axles	6 axles	7 axles	8 axles	9 axles
4	1.000							
5	1.000							
6	1.000							
7	1.000							
8 and less	1.000	1.000						
More than 8	1.118	1.235						
9	1.147	1.250						
10	1.176	1.279						
11		1.294						
12		1.324	1.471					
13		1.338	1.485					
14		1.368	1.515					
15		1.382	1.529					
16		1.412	1.544	1.706				
17		1.426	1.574	1.721				
18		1.456	1.588	1.735				
19		1.471	1.603	1.765				
20		1.500	1.632	1.779	1.941			
21		1.515	1.647	1.794	1.956			
22		1.544	1.662	1.809	1.956			
23		1.559	1.691	1.838	2.000			
24		1.588	1.706	1.853	2.015	2.176		
25		1.603	1.721	1.868	2.029	2.191		
26		1.632	1.750	1.882	2.044	2.206		
27		1.647	1.765	1.912	2.059	2.221		
28		1.676	1.779	1.927	2.088	2.250	2.412	
29		1.691	1.809	1.941	2.103	2.265	2.426	
30		1.721	1.824	1.956	2.118	2.279	2.441	
31		1.735	1.838	1.985	2.132	2.294	2.456	
32		1.765	1.868	2.000	2.147	2.309	2.485	2.647
33			1.882	2.015	2.176	2.324	2.500	2.662
34			1.897	2.029	2.191	2.353	2.515	2.676
35			1.926	2.059	2.206	2.368	2.529	2.691
36			1.941	2.074	2.221	2.382	2.544	2.706
37			1.956	2.088	2.235	2.397	2.559	2.735
38			1.985	2.103	2.265	2.412	2.574	2.750
39			2.000	2.132	2.279	2.427	2.603	2.765
40			2.015	2.147	2.294	2.456	2.618	2.779
41			2.044	2.162	2.309	2.471	2.632	2.794
42			2.059	2.176	2.324	2.485	2.647	2.809
43			2.074	2.206	2.353	2.500	2.662	2.824
44			2.103	2.221	2.368	2.515	2.676	2.838
45			2.118	2.235	2.382	2.529	2.691	2.868
46			2.132	2.250	2.397	2.559	2.721	2.882
47			2.162	2.279	2.412	2.574	2.735	2.897
48			2.176	2.294	2.441	2.588	2.750	2.912
49			2.191	2.309	2.456	2.603	2.765	2.926
50			2.221	2.324	2.471	2.618	2.779	2.941
51			2.235	2.353	2.485	2.632	2.794	2.956
52			2.250	2.368	2.500	2.662	2.809	2.971
53			2.279	2.382	2.529	2.676	2.838	3.000
54			2.294	2.397	2.544	2.691	2.853	3.015
55			2.309	2.426	2.559	2.706	2.868	3.029
56			2.338	2.441	2.574	2.721	2.882	3.044
57			2.353	2.456	2.588	2.735	2.897	3.059
58				2.471	2.618	2.765	2.912	3.074
59				2.500	2.632	2.779	2.926	3.088
60				2.515	2.647	2.794	2.956	3.103

INSTRUCTIONS:

1. Determine the scale's CLC
2. Count the number of axles on the vehicle in a given span and determine the distance in feet between the first and last axle in the span.
3. Multiply the CLC by the corresponding multiplier in the table*
4. The resulting number is the scale's maximum concentrated load for a single span based on the vehicle configuration.

*Note: This table was developed based upon the following formula. Values may be rounded in some cases for ease of use.

$$W = r \times 500 \left[\left(\frac{LN}{N - 1} \right) + 12 N + 36 \right]$$

Appendix L

National Type Evaluation Technical Committee (NTETC)
Measuring Sector Meeting
October 19-20, 1996, Charleston, West Virginia

Meeting Summary

Agenda Items

1) Update to NCWM Publication 14
2) Status of the Family of Products for Mass Flow Meters; Changes to the Tests for Mass Flow Meters
3) Changes to Section 3.37 Mass Flow Meters Section of NIST Handbook 44
4) Checklist for Mass Flow Meters
5) Clarification of the Language on the Allowable Tolerance Error Band for Permanence Tests for Mass Flow Meters
6) Status of the Compressed Natural Gas (CNG) Retail Motor-Fuel Dispenser Examination Procedure Outline (EPO) and Checklist
7) Status of Mutual Recognition of Type Evaluation Between Canada and the United States
8) Status of the Cryogenic Liquid-Measuring Devices Checklist
9) NTETC Chairman Terms of Office
10) Unattended Cash-Activated Retail Motor-Fuel Dispensers
11) Cash-, Credit Card-, or Debit Card-Activated Devices Printed Ticket Information
12) NTEP Testing for Low Product Sensors/Indicators in Retail Motor-Fuel Dispensers with Blending Capability
13) Expanded Checklist Procedures for Testing with Small Volume Prover Standards
14) Changes to Section 3.37 Mass Flow Meters Section Paragraph S.1.3.1. Handbook 44 to include Units of Volume
15) Changes to Section 3.30 Liquid-Measuring Devices Code to Require Full Computing-Type Retail Motor Fuel Device
16) Change in NTEP Administrative Fee Structure; Policy Concerning Reanalysis of Application
17) Definition of System Controller as Used in the Audit Trail Criteria

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1) Update to NCWM Publication 14

Background: The following changes were adopted by the 81st National Conference on Weights and Measures (NCWM) and will be reflected in the 1997 edition of Handbook 44, Section 3.30. Liquid-Measuring Devices paragraph S.3.1.(b) and Publication 14. These items were included as part of the agenda to inform the Measuring Sector of the immediate changes that would take place in National Type Evaluation Program (NTEP) procedures as a result of NCWM actions.

a) S.3.1. Diversion Prohibited Liquid-Measuring Devices

Background: The NCWM adopted modifications to the language in paragraph S.3.1. of the Liquid-Measuring Devices Code. The new language now permits manual diversion of product in the measuring system for agri-chemical applications under certain conditions and reads as follows:

S.3.1. Diversion of Measured Liquid. - No means shall be provided by which any measured liquid can be diverted from the measuring chamber of the meter or its discharge line.

Two or more delivery outlets may be installed only if automatic means are provided to ensure that:

(a) liquid can flow from only one outlet at a time, and

(b) the direction of flow for which the mechanism may be set at any time is clearly and conspicuously indicated.

A manually controlled outlet that may be opened for purging or draining the measuring system or for recirculating product in suspension shall be permitted only when the system is measuring food products or agri-chemicals. Effective means shall be provided to prevent passage of liquid through any such outlet during normal operation of the measuring

system and to inhibit meter indications (or advancement of indications) and recorded representations while the outlet is in operation.

Conclusion: The Sector agreed to modify the 1997 edition of Publication 14, to correspond with changes made to NIST Handbook 44 at the July 1996 Annual Meeting of the NCWM.

The modifications will appear under Sections 11 and 21 of the Liquid-Measuring Devices Code Checklist in Publication 14, covering Discharge Lines and Discharge Line Valves of Retail Motor-Fuel Dispensers and Wholesale and Loading-Rack Meters as follows:

11. Discharge Lines and Discharge Line Valve

11.3. Except as identified above, a manually controlled outlet may be installed to be opened for purging or draining the measuring chamber when the system is measuring food products or recirculating agri-chemical products in suspension if suitable means are provided to ensure liquid cannot flow through any such outlet during normal operation and to prevent advancement of meter indications and recorded representations while the outlet is in use.

21. Discharge Lines and Discharge Line Valve

21.2. Except as identified above, a manually controlled outlet may be installed to be opened for purging or draining the measuring chamber when the system is measuring food products or recirculating agri-chemical products in suspension if suitable means are provided to ensure liquid cannot flow through any such outlet during normal operation and to prevent advancement of meter indications and recorded representations while the outlet is in use.

The Sector also recommends the NCWM Specifications and Tolerances (S&T) Committee continue in its work to develop a definition for agri-chemicals.

b) Tentative Carbon Dioxide Liquid-Measuring Devices Code

Background: In July 1996, the NCWM adopted Tentative Code Section 3.38 for Carbon Dioxide Liquid-Measuring Devices to Handbook 44. Publication 14 does not include criteria or test procedures for this type of device.

Conclusion: The Sector agreed that Steve Cook (California) will head a sumcommittee for the continued development of a Checklist for Carbon Dioxide Liquid-Measuring Devices, which is projected to be complete in 3-6 months. The checklist will be based on California's Draft Examination Procedure Outline (EPO) for Carbon Dioxide Liquid-Measuring Devices. The determination of the checklist criteria and procedures will be the result of a collaborative effort among Mr. Cook, Charlie Nelson (California) and Ken Hoffer (Hoffer Flow Controls). Upon completion, the final draft of the checklist will be presented to the Sector for review.

2) Status of The Family of Products for Mass Flow Meters; Changes to the Tests for Mass Flow Meters

Background: Originally, NTEP Certificates of Conformance (CCs) issued for metering devices covered applications for those products which were used during type evaluation. Manufacturers found it difficult to predict every product these meters might be used to dispense. Testing a meter with every possible product would be too costly to the manufacturer and place a strain on NTEP resources. In 1991 the Sector adopted a policy for positive displacement meters to alleviate the need for extensive testing by grouping products into families, based on their commercial use, the similarities in their viscosities, specific gravities, and other related properties. The policy was agreed to and based on the demonstrated performance of positive displacement meters, which is fairly predictable with changes in viscosities. Although NTEP routinely tests other types of metering technology, there is no policy established for covering ranges of specific product types metered by these devices. There are also inconsistencies in how NTEP currently lists products covered on mass flow meter CCs; a CC may list a range of specific gravities, but does not address other differences in product properties, such as extreme temperature or pressure, which might influence meter performance.

At the October 1994 Sector meeting, discussion began to address the development of a policy or family product list, which would reduce the amount of testing and is representative of mass flow meter performance over a range of products. The 1994 meeting concluded with the formation of a subgroup to address this issue; the subgroup included the following associate members: Norm Alston (Daniel Flow Products), Mike Keilty (Micro Motion), Tim Scott (Brooks Instrument), John Skuce (Smith Meter), and

Randy Smith (Schlumberger Industries). The mass flow meter manufacturers were approached at that time and more recently by Mike Keilty through a June 1996 letter ballot requesting their input to help establish specific performance parameters for these devices.

Schlumberger Industries submitted a proposal which recommended changes to the existing testing procedures to reduce the cost and requirement for additional testing on multiple products types. The Sector was asked to determine if the proposed changes to existing test procedures for permanence tests and the addition of new product groups and meter sizes are acceptable for mass flow meter testing. The major differences between the proposal and existing procedures in Publication 14 are outlined in the table below:

1996 Publication 14 Test Procedure	Proposed Test Procedure
Initial Test and Permanence Test (60 days or 2000 x max. flow) 5 Tests @ 4 Flow Rates	Conduct Initial Full Set of Tests (5 Tests @ 4 Flow Rates) in Laboratory with Specific Product with NO subsequent Permanence Test
New Products - Initial and Permanence Tests for each Product Type 5 Tests @ 4 Flow Rates (Initial Tests) 5 Tests @ 4 Flow Rates (Permanence Tests)	New Products (Initial Test Only) 3 Tests @ 3 Flow Rates (meter min. flow - ***site*** max. flow) Multiple Products (test two products w/widest s.g. range)
Repeatability - Suggested Method Calculate Standard Deviation (s) for flow data Determine if Range of the Errors is within the Allowable Error Band ($X \pm 2s$)	Repeatability - Do not apply Standard Deviation
Permissible Meter Family Flow Rates CC covers 50-200% of Meter Flow Rate Tested	Permissible Meter Family Flow Rates If 50-200% of the Meter Flow Rate Tested is greater than 50% of the Flow Rate of the next Smallest or Largest Meter; CC covers 10:1 range of meter sizes
Permissible Meter Family Size CC covers 50-200% of Meter Flow Rate Tested **OR** Must test New Size 5 Tests @ 4 Flow Rates (Initial/Permanence)	Permissible Meter Family Size (Not covered by above application) 3 Tests @ 3 Flow Rates Must Attain 80% Max Flow Rate Any Product as Test Medium

The lack of a policy continues to raise the question of how NTEP will proceed on verifying claims on a product type application. Existing policy for cryogenic and LPG meters are not based on specific gravity, thus making it difficult to derive guidelines based on observations of meter performance in those areas. Another important issue which continues to be raised by manufacturers is the unfair competitive advantage given to companies with unconditional CCs and the burden imposed by additional restrictions to evaluate new product applications.

Discussion: A justification was provided for some of the NTEP inconsistencies in product applications covered on CC's. It was determined that the limitations placed on specific product application were the result of meter failures which occurred during actual testing. Other product applications were limited because of vast differences in product properties and for the remainder of product applications there did not appear to be any logic. It was stressed that there was a need for information from the experts on this technology and it was felt that the Sector was an ideal forum for the best assembly of that expertise. There is a sense of urgency to reach closure on this issue because of the likelihood that impending challenges on the validity of existing CCs may force the modification of existing CCs to cover only those products which were tested.

A key point which was repeated throughout the meeting is that if product type was not a factor affecting meter performance, then this must be demonstrated. Comments indicate there may be several influences on meter performance such as design, ambient temperature, and densities depending on the system design. Another possible variable which entered into the discussion was that the performance of the Coriolis meter's less linear in the lower flow ranges. The group was reminded that there are five separate accuracy classes which clearly make a distinction in the product application.

The theory behind performing permanence tests was discussed at length. It was suggested to the Sector that the American Petroleum Institute (API) may have data which demonstrates mass flow meter performance over time. Canada indicated it has performed extensive permanence testing, however, it does not feel comfortable with grouping products into classes based solely on this information. Several mass flow meter manufacturers noted that there have been instances where corrosion of the meter tubes has resulted in catastrophic failure of the system; however, they also noted the corrosion process took place due to the improper selection of the tubing materials. Additional comments heard indicate that there is no data which demonstrates whether rezeroing or flucuations in flow rate have any influence on mass flow meter performance.

Current standards for the minimum amount of test data were established to provide the participating laboratory with a sufficient number of data points to ensure confidence in the meter's performance over its range of flow rates which is also critical when looking at meter error based on standard deviation. It was suggested that the number of test runs somehow correlate to the turndown ratio for the meter.

Schlumberger indicated that it is difficult and costly to obtain adequate field test sites where it is possible to operate mass flow meters over the full range of flow rates. It was asked if there were some minimum criteria which would be acceptable to remedy that situation. Other areas of concern which were expressed by Schlumberger is that NTEP policy limits CC coverage to meter sizes which are 50 percent smaller and 200 percent larger than the meter tested. Schlumberger indicated that mass flow meters have a ratio of maximum to minimum flow rate which is much larger than other meters; therefore, this policy often eliminates the next meter size within a family of meters from being covered without additional testing of that meter. Schlumberger recommended that it be sufficient to reach 50 percent of the next largest meter's flow rate. The question was asked if this became policy would it apply to other meter technology.

It was recommended that the proposal might be more palatable if it were divided into individual proposals rather than asking the Sector to accept a complete revision of existing procedures.

Conclusion: The Sector discussed the proposal submitted by Schlumberger to modify the mass flow meter test procedures and product evaluation criteria at length; however, the Sector voted 11 to 4 not adopt the proposal.

A subcommittee consisting of Eric Kappelt (Smith Meter)(to replace John Skuce), Mike Keilty (Micro Motion), Andre Noel (Schlumberger)(to replace Randy Smith), Johnny Parrish (Brooks Instrument)(to replace Tim Scott), and Will Wotthlie (Maryland) will develop a questionnaire asking for input on which variables, (e.g., flow rate, product, meter size, testing procedure, etc.) may influence mass flow meter performance. The questionnaire will be distributed to selected weights and measures jurisdictions for input. Based on input from Steve Malone (Nebraska) and time permitting, the Sector will ask if Dick Suiter (Nebraska) will consider reviewing the data, for his input on the survey findings. The group plans to distribute the questionnaire by December 1 and have the results analyzed by the 1997 NCWM Interim Meeting. Based upon information collected from the survey, the Sector will develop an approach to address the issues surrounding mass flow meter testing.

The Sector also recognized the need to develop criteria which will address the various types of mass flow meter technologies available.

3) Changes to Section 3.37 Mass Flow Meters Code Section of NIST Handbook 44

Background: At the 1995 meeting, proposed changes to the Mass Flow Meter Code were submitted to the Sector by California. The modifications were to be reviewed concurrently with the proposed Compressed Natural Gas Retail Motor-Fuel Dispenser Checklist. The subgroup (see Item 6), which had also agreed to review the CNG Checklist, was to study the proposed code sections, then refine and submit them to the NCWM S&T Committee for the 1996 Interim Meeting. These modifications are proposed as changes to NIST Handbook 44 Mass Flow Meters Code section.

Comments received after the 1996 Sector meeting indicate the requirement proposed in paragraph UR.1.1.1. should be harmonized with the Canadian requirement of 15 feet, also the mast support for the CNG hose necessitates a longer hose than the permissible 12 foot length. Similar recommendations were made at the June 1996 meeting of the CNG Retail Motor-Fuel Dispenser working group.

Conclusion: The Sector recommended that the NCWM S&T Committee add the following proposed specifications and user requirements to the Mass Flow Meters Code section in Handbook 44. The group felt that changes should be made in paragraph UR.1.1.1. Length (c) to indicate that the length of the discharge hose shall not exceed 4.6 m (15 ft), thus to align U.S. and Canadian requirements. It was also recommended that the nonretroactive dates be removed from the requirements.

> **S.1.6.1. Indication of Delivery. -** The device shall automatically show on its face the initial zero condition and the quantity delivered (up to the nominal capacity).
>
> However, the first 0.03 L (0.009 gal) of a delivery and its associated total sales price need not be indicated.
>
> **S.1.6.5.4. Selection of Unit Price. -** Except for dispensers used exclusively for fleet sales, other price contract sales, and truck refueling (e.g., truck stop dispensers used only to refuel trucks), when a product or grade is offered for sale at more than one unit price through a computing device, the selection of the unit price shall be made prior to delivery

using controls on the device or other customer-activated controls. A system shall not permit a change to the unit price during delivery of product. [Effective and nonretroactive as of January 1, 1991]

S.1.6.6. Agreement Between Indications. - When a quantity value indicated or recorded by an auxiliary element is a derived or computed value based on data received from a retail motor-fuel dispenser, the value may differ from the quantity value displayed on the dispenser, provided the following conditions are met:

(a) all total money values for an individual sale that are indicated or recorded by the system agree, and

(b) within each element, the values indicated or recorded meet the formula (quantity x unit price = total sales price) to the closest cent. [Nonretroactive as of January 1, 1988.]

S.2.5. Zero-Set-Back Interlock, Retail Motor-Fuel Devices. - A device shall be constructed so that:

(a) after a delivery cycle has been completed by moving the starting lever to any position that shuts off the device, an automatic interlock prevents a subsequent delivery until the indicating elements, and recording elements if the device is equipped and activated to record, have been returned to their zero positions;

(b) the discharge nozzle cannot be returned to its designed hanging position (that is, any position where the tip of the nozzle is placed in its designed receptacle and the lock can be inserted) until the starting lever is in its designed shut-off position and the zero-set-back interlock has been engaged; and

(c) in a system with more than one dispenser supplied by a single pump, an effective automatic control valve in each dispenser prevents product from being delivered until the indicating elements on that dispenser are in a correct zero position.

S.5.1. Totalizers for Retail Motor-Fuel ~~Dispensers~~ Devices. - Retail motor-fuel dispensers shall be equipped with a nonresettable totalizer for the quantity delivered through the metering device. [Nonretroactive as of January 1, 1995.]

UR.1.1.1. Length

(c) shall not exceed ~~5.5 m (18 ft)~~ ~~3.6 m (12 ft)~~ 4.6 m (15 ft) unless it can be demonstrated that a longer hose is essential to permit deliveries to be made to receiving vehicles or vessels.

UR.2.1. Manufacturer's Instructions. - A device shall be installed in accordance with the manufacturer's instructions, and the installation shall be sufficiently secure and rigid to maintain this condition.

UR.2.2. Discharge Rate. - A device shall be installed so that the actual maximum discharge rate will not exceed the rated maximum discharge rate. Automatic means for flow regulation shall be incorporated in the installation if necessary.

UR.3.1. Return of Indicating and Recording Elements to Zero. - On any dispenser used in making retail deliveries, the primary indicating element, and recording element if so equipped, shall be returned to zero before each delivery.

Exceptions to this requirement are totalizers on key-lock-operated or other self-operated dispensers and the primary recording element if the device is equipped to record.

4) Checklist for Mass Flow Meters

Background: Publication 14 includes a section entitled "Additional Checklist and Test Procedures for Mass Flow Meters" which briefly details the test procedures for these devices. Unlike other metering devices which undergo NTEP testing, there are no separate procedures, which elaborate on mass flow meter testing, listed under the Liquid-Measuring Devices Criteria in Publication 14. NTEP continues to get requests for type evaluation of Mass Flow Meters and must be able to provide guidance to the manufacturers on what testing of these devices will entail.

At the October 1995 meeting a subgroup was appointed to develop a draft checklist for Mass Flow Meters. The subgroup consisted of Pat Hardock (Canada LMB), Monty Hopper (Kern County Weights and Measures, California), Eric Kappelt (Smith Meter Inc.), Mike Keilty (Micro Motion Inc.), Kelly White (Brooks Instrument), and Will Wotthlie (Maryland Weights and

Measures) and an undetermined representative from Schlumberger Industries. At the 1996 meeting, the Sector asked the subgroup for an update on the checklist status.

It was noted that code references within Publication 14 still reflect various code sections that applied prior to the adoption of the mass flow meter code. Mr.Keilty recommended that the Sector contract with a party that is familiar with mass flow meter technology and the NCWM Examination Procedure Outlines to create a checklist for mass flow meters. Tina Butcher (NIST) suggested the chair list the Sector's requests for funding the contract in its list of priorities.

Conclusion: The Sector believes that the project to develop a mass flow meter NTEP checklist is a priority item and should be completed in conjunction with an Examination Procedure Outline for mass flow meters by a contractor. The Chairman will assign this proposal a priority status and forward it to the Executive Committee for consideration as part of their strategic plan for the committee.

5) Clarification of the Language on the Allowable Tolerance Error Band for Permanence Tests for Mass Flow Meters

Background: The suggested method for type evaluation testing of mass flow meters as specified in Publication 14 (May 1996), Page 10-75, Field Evaluation and Permanence Tests for Meters, Liquid-Measuring Devices, Repeatability for Mass Flow Meters reads as follows:

1. Using known weight (primary standard), determine the error present in the weighing instrument over the weighing range that will be used in the test. The inherent error, if present, is to be factored out of the measurement. The scale will then be used as a transfer standard.

2. Establish proper flowmeter calibration conditions -- steady state conditions at each flow rate. Collect the test data for the selected flow rates. The indication shall be on the basis of apparent mass.

3. Calculate the mean error ($\bar{x}$) and the standard deviation(s) for the data collected at each flow rate.

4. Calculate the error band for each flow rate using the following equation: $\bar{x} \pm 2s$.

5. The difference between the most significant error in the positive direction and the most significant error in the negative direction should not exceed the tolerance error band to be applied.

When volumetric delivery from the flowmeter is the basis for evaluating performance, the above mass determination must be converted to volume through the meter using the fluid density at the meter location (this assumes that no leaks exist between the meter and the collection vessel).

There appears to be some disagreement over how paragraphs 3-5 are to be applied. The Sector was asked to review this criteria and add language and possibly an example to clarify how the criteria are to be applied.

Conclusion: This item was tabled due to lack of time.

6) Status of the Compressed Natural Gas (CNG) Retail Motor-Fuel Dispenser Examination Procedure Outline (EPO) and Checklist

Background: During the October 1993 meeting the Sector established a subgroup to work with the Natural Gas Vehicle Coalition (NGVC) to develop an examination procedure outline (EPO) for use in field testing of compressed natural gas (CNG) retail motor-fuel dispensers. The group was provided with draft test procedures from Jim Akey (WI) developed on behalf of the NCWM Metrologist Group, Nebraska Weights and Measures, California Division of Measurement Standards, and additional guidelines based on the Office of Weights and Measure's (OWM's) work with Maryland Weights and Measures.

At the October 1995 meeting California distributed a revised version of its 1993 EPO to the Sector. A group of representatives from the associate membership and NTEP laboratories which were affected by the procedure were to review the EPO and provide input to Mike Keilty. Sector members comprising this group were Ross Andersen (New York Weights and Measures), Richard Huff (Universel Epsco), Gordon Johnson (Gilbarco), Mike Keilty (Micro Motion), Dick Shockley (Maryland Weights and Measures), Bob Traettino (Liquid Controls Corp.), and Rich Tucker (Tokheim).

A group of representatives from the NGVC, device manufacturers, NTEP, and NIST met on June 13-14, 1996. The group reviewed a draft EPO consolidated from the three earlier EPOs drafted in 1993. The meeting concluded with plans to conduct additional testing to refine and determine test procedures which were most applicable to this technology. The NGV4 Subcommittee, which met in late July, was tasked to establish guidelines for a safe protocol and discharge of product after testing. The group had projected the third quarter 1996 for the completion of a final draft of the EPO.

Discussion: At the 1996 meeting, Mike Keilty reported for the group tasked in 1995 to develop the EPO, that the return of product issue has continues to be an informational item on the NCWM S&T Committee agenda. Mr. Keilty also indicated that the status of the EPO was dependent on the findings of the NGV4 Subcommittee. In response to a comment that the Liquid Measuring Devices Codes would apply to CNG retail motor-fuel dispensers, Mr. Keilty noted that prior to the adoption of the mass flow meter code a number of other code sections were applicable to and did reference mass flow meters, however they were not covered during the June 13-14 meeting.

Some concern was expressed over the ability of a 100-pound capacity scale to achieve the necessary resolution for a transfer standard. The group discussed the hose length requirement in paragraph UR.1.1.1. California indicated some dispensers have problems meeting accuracy requirements when they exceed 12 feet. One jurisdiction noted that hose length is properly determined by the manufacturer. The group was reminded that the original 18 foot hose length established for retail motor-fuel dispensers was established to prevent damage to the hose from station traffic.

Conclusion: Sector members were tasked to evaluate and comment on the latest draft version of the EPO that had been included with the meeting agenda. Sector comments, findings from the NGV4.9 Subcommittee on return of product and other safety issues, in conjunction with data from tests being conducted on the east and west coast by the June 1996 working group, will be incorporated into the final EPO. Requirements that are part of the Liquid-Measuring Devices Code, which have been proposed to the NCWM S&T Committee for incorporation into the Mass Flow Meters Code Section of Handbook 44, will also be evaluated in anticipation of their eventual adoption by the NCWM in July 1997.

Sector members are to review the draft checklist developed by California and forward comments to Juana Williams (NIST) by January 1, 1997. The checklist will be revised in accordance with feedback from the Sector and other interested parties. A letter ballot will be circulated to members asking that Sector members approve the final document for inclusion in the next edition of NCWM Publication 14.

7) Status of Mutual Recognition of Type Evaluation Between Canada and the United States

Background: In the fall of 1992, initial dialogue on the harmonization of U.S. and Canada weights and measures requirements for type evaluation began in an effort to reduce existing trade barriers. Members of the National Conference on Weights and Measures and representatives from Canada's Legal Metrology Branch (LMB) agreed that the groups's first priority would be to establish mutual recognition of type evaluation of weighing devices, for testing performed by either the United States or Canada. By April 1993, the work group formulated a plan to eliminate the need to complete testing in both countries. The group focused on type evaluation processes similarities and differences. Their efforts resulted in a unified set of testing procedures, checklist, application form and applicant's guide which met the requirements for both the United States and Canada. In April 1994, the U.S./Canada Mutual Recognition of Type Evaluation Program accepted its first application. Devices which were successful in completing all test criteria were issued certification in both countries.

The NCWM began to explore the possibility of a similar mutual recognition program for liquid-measuring devices (LMD). The Conference later recommended that this issue be brought before the Measuring Sector.

At the October of 1994 Sector meeting discussions began on mutual recognition of type evaluation for LMD's. Associate members agreed this work should be a joint effort of representatives from both the wholesale and retail manufacturers. In addition, NCWM Chairman Jim Truex recommended that the mutual recognition group be kept manageable in size and consist of a minimum of two representatives from both associate areas, Canada and the U.S. participating laboratories. Following those recommendations a work group was formed consisting of representatives from the Meter Manufacturers Association and Gasoline Pump Manufacturers Association, as well as representatives from both participating laboratories. The members of the subgroup are Norm Alston, (Daniel Flow Products Inc.), Charlie Gardner (Suffolk County Weights and Measures, New York), Mel Hankel (Liquid Controls), Mike Keilty (Micro Motion), Grant Obermeier (Irving Oil Limited), Johnny Parrish (Brooks Instrument), Bill Raymond (Accurate Metering), Tim Scott (Brooks Instrument), John Skuce (Smith Meter Inc.), Randy Smith (Schlumberger), Jim Truex (Ohio Weights and Measures), Tina Butcher (NIST) and Juana Williams (NIST). The subgroup met on October 23, 1994, to discuss some preliminary details necessary to establish an evaluation process, and to agree on a time frame. Initially the

group decided to examine the dissimilarities in the U.S./LMB procedures, but later agreed that a review of the processes which permitted the success in mutual recognition of weighing devices seemed to be the best course of action. It appeared that the greatest barrier to that success was the differences in tolerances. This obstacle was resolved by applying the most stringent of the requirements and focusing the program on smaller capacity devices, thus moving away from harmonization and more in the direction of mutual recognition.

The major differences noted between U.S./Canada LMD type evaluation were as follows: 1) LMB laboratory testing is over a temperature range of 0 °C to 40 °C, which is noted on the Notice of Approval, 2) LMB laboratory and field testing for radio frequency interference, and 3) LMB laboratory's capability to test both retail and wholesale meters that range in size from 0-4 inches. The group concluded the LMB test procedures reveal more information about the meter performance under varying conditions than U.S. field tests.

The enormity of the differences prompted the group to take a new approach and examine the areas of commonality. The possibility of locating a U.S. laboratory with temperature capability appears to be remote. Some indicated there would be no point in pursuing mutual recognition if there is no U.S. laboratory available. Some suggested solutions to that predicament were to: 1) secure a government facility, or 2) conduct parts of the evaluation in Canada and the remaining portion in the United States.

The Sector was aware of the current restructuring within the International Organization of Legal Metrology (OIML), and indicated that consistency with the OIML procedures should be considered in the creation of this process.

NIST provided the LMB with electronic files of Handbook 44, Publication 14 and the OIML standards documents in preparation for the inaugural meeting of the subgroup that was held April 10-12, 1995, in Ottawa, Ontario Canada. The group's discussions on the differences, such as the U.S. requirement for submitting specific products, were facilitated by a matrix created by the LMB, which permitted a line by line comparison of U.S./Canada test requirements.

Initially the first devices targeted for LMD mutual recognition will be electronic controllers and stand-alone dispensers in which the measuring element and indicator have already been evaluated for temperature effects. The next level would be to move on to evaluate a retail dispenser in Canada. Canada expressed an interest in mutual type evaluation of associated equipment such as remote indicators and consoles. Both Canada and NIST felt budgetary limitations and the restructuring within both offices would not permit a second meeting until Spring 1996.

Conclusion: At the 1996 meeting, the Sector was updated on the work of the NCWM Executive Committee in developing a Strategic Plan for the NCWM. The Sector was encouraged to provide feedback to the Executive Committee which would help them to prioritize measuring-related issues.

The Sector Chairman and Technical Advisor are tasked to create a list of priority items for the Sector, which are to include the goals of the Mutual Recognition Working Group; this list will be circulated to the Sector for input on the relative priority of these items. The Sector felt completion of mutual recognition in the Liquid-Measuring Devices area should be pursued before attempting recognition or harmonization with the OIML requirements in other device areas. Both the U.S. and Canada indicated that resources were not available to pursue this item. The manufacturers were encouraged to communicate their preference to see this item receive a high priority in the hierarchy of the Executive Committee Strategic Plan and the Legal Metrology Branch.

In addition, the Sector agreed that a high priority should be placed on establishing and maintaining the EPOs and training.

8) Status of the Cryogenic Liquid-Measuring Devices Checklist

Background: Publication 14 contains some references to the type evaluation of cryogenic meters in the test procedures; however, this checklist is not all inclusive of Handbook 44 code requirements specifically for this device type. NTEP continues to get increasing numbers of inquiries about the requirements and test procedures for devices which meter cryogenic liquid products. A recognized procedure for type evaluation of devices which meter cryogenic liquids will provide the necessary information to manufacturers seeking type evaluation.

At the 1995 meeting, California submitted a proposed Checklist for Cryogenic Liquid-Measuring Devices. A working group was formed to review and refine the checklist. The working group consisted of Associate Members John DeFeo (Hoffer Flow Controls), John Skuce (Smith Meter Inc.), and Bob Traettino (Liquid Controls Corp.) and would report their findings to California.

The Sector asked for an update from the working group.

Conclusion: This item was tabled due to lack of time.

9) NTETC Chairman Terms of Office

Background: The National Type Evaluation Technical Committee (NTETC) Measuring Sector Chairman's duties are performed by a volunteer. However, the terms of office for this position are not governed by the NCWM Constitution and Bylaws. The selection, election or appointment process, in addition to the terms of office are stipulated in NCWM Publication 1 for the chairman position within other committees. The sole requirement that is shared by NTETC chairmen and other chairmen positions is that all are members in good standing with the NCWM.

The Sector recommended the Chairman serve a 2- year term; the Vice-Chairman shall be appointed in the second year of that term. The Board of Governors (BOG) asked for recommendations on the establishment of formal procedures for appointment of the chairman, if a lack of procedures have precipitated some difficulties.

The Sector was advised that NTETC Measuring Sector Chairman Norm Alston tendered his resignation just prior to the 1996 meeting, the Sector subsequently selected a new Chairman. Similar events within the NTETC Grain Moisture Meter and Near Infrared Protein Analyzer (GMM/NIR) Sector have resulted in the creation of a set of bylaws for that Committee's Chairman position (see attachment). The GMM/NIR Sector developed guidelines which determine the eligibility, duties, term of office, nomination and election for their chairman. Additionally, they have extended those guidelines to cover the duties of the sector technical advisor. Recommendations have been made to alternately select a Chairman from the associate and public membership, with no two consecutive terms of office or concurrently held positions being occupied by a representative from the same membership and/or association representative.

Conclusion: The Sector agreed that a chairman will be elected for a 3-year term, and the position will be reexamined after that time. Rich Tucker (Tokheim) has been selected as Sector Chairman for the initial 3-year term of office. Part of his duties will be to develop and circulate to Sector members for their review and comment, a set of criteria or bylaws by which the Sector will operate. The Sector will consider the criteria developed by the Grain Moisture Meter/Near-Infrared Grain Analyzer Sectors as a possible model for these criteria.

The Sector also agreed that an associate chairman should be elected to serve in the event that the chairman is unable to serve at a particular meeting. The Sector did not elect an Associate Chairman at this meeting.

10) Unattended Cash-Activated Retail Motor-Fuel Dispensers

Background: At its 1992 meeting, the Sector reviewed a proposed checklist along with several questions related to the operation of retail motor-fuel dispensers equipped with the cash acceptor option at attended locations. The Sector addressed the possible means of retrieving transaction information in the event of a power loss. A printed receipt must be made available to the customer at the device; in addition, the device must have some form of low paper sensor. The cash acceptor should automatically issue a receipt: 1) if the amount dispensed is less than the total money inserted and 2) print the amount of change due. However, there are no requirements for these devices to display the information once delivery had started. There were additional concerns over the large denomination of bills which might be used in these transactions and the ability to refund monies if product was not delivered. Instructions must be provided to the customer on how to operate the cash acceptor, although there is no designated format for this information. A proposed checklist was distributed to the Sector members by letter ballot. At that time the Sector anticipated the development of technology for the cash acceptor option on dispensers at unattended locations. A subcommittee was established to address the need for a checklist for cash acceptors at unattended operations. The subcommittee consisted of associate members Gordon Johnson (Gilbarco), Debbie Joines (Wayne Dresser), Larry Murray (Wayne Dresser), and Rich Tucker (Tokheim).

Discussions at the 1993 Sector meeting focused on alternative methods to ensure the cash acceptors in operations at attended locations would continue to operate in the event of power loss. The Sector acknowledged that there were limited requests for cash acceptor options at unattended locations and expressed some concerns over fire codes prohibiting unattended installations. Members present representing GPMA agreed to address the need for additional checklist criteria for these installations in the event the need presented itself in the future.

Recent input to Office of Weights and Measures (OWM) indicated a need to develop specific procedures for cash-activated retail motor-fuel dispensers at unattended locations. Comments to OWM indicate that cash acceptors installed in unattended operations may be appropriate if they meet the requirements of Handbook 44, paragraph G-UR.3.4. Responsibility, Money-Operated Devices; if there is adequate display of information detailing the method for the return of monies paid when the product or service cannot be obtained. The Sector will be asked to examine the need for additional criteria which would address unattended applications.

Discussion: It was noted by one manufacturer that there are already cash activated dispensers in operation at unattended sites. Initially, the Sector had decided to delineate between attended and unattended sites because they felt there were differences in the application. Specific issues such as power loss, low paper sensor, bills stuck in the cash acceptor before their monetary value is verified were discussed. It was noted that devices equipped with uninterruptable power source would provide a means to complete any transaction in progress at the time of a power loss. The final decision to accept these devices in operation at unattended location is ultimately left to each jurisdiction. It was pointed out that, due to security, a station attendant may not respond immediately if there are monetary discrepancies to be resolved. The group felt that there did not need to be additional requirements placed on devices intended to operate at unattended locations and they would be held to all the criteria that currently apply to attended locations. Each manufacturer will have to ensure dispensers which are intended to operate at unattended sites meet the criteria established in the checklist and those with Certificates of Conformance will need to notify NTEP of the change in application. It was agreed that posting in accordance with G-UR.3.4. Responsibility, Money-Operated Devices would apply to those devices and must be on the device. Additional instructional information may be placed on the device or the receipt.

Conclusion: The current checklist criteria will be applied to all installations regardless of whether they are unattended or attended operations. All references to "attended" will be removed from the existing checklists in Publication 14. The Sector recognized that the decision to accept these operations will be decided by the presiding weights and measures authority. NIST will send a letter to all State Directors and to manufacturers who hold Certificates of Conformance (CCs) on these devices. The letter will indicate that NTEP recognizes both attended and unattended operations under the same criteria, but unattended locations must comply with G-UR.3.4. Manufacturers who hold CCs with the cash acceptor option and wish to have the unattended application covered will contact NIST to request that unattended application be added to the CC.

11) Cash-, Credit Card-, or Debit Card-Activated Devices Printed Ticket Information

Background: At the 1996 NCWM Annual Meeting the S&T Committee considered adding the following paragraph to Handbook 44. The NTETC Measuring Sector has required a receipt for some time for card- and cash-activated retail motor-fuel dispensers, however, current Publication 14 checklist procedures require more information on printed tickets than is required by Handbook 44. Additionally, the existing criteria in Publication 14 for evaluation of cash-operated systems addresses attended locations only. In the event of a cash transaction the consumer is left with no record to verify any portion of the transaction. Comments received during the 1996 NCWM Interim Meeting from GPMA and a weights and measures representative, indicate that this requirement should apply to all installations regardless of whether the payment acceptor location is attended or unattended.

UR.3.4.1. Ticket Requirement. - A device which is card and/or cash-activated shall be equipped with a ticket printer. Except for fleet sales and other price contract sales, a printed receipt providing the following information shall be available for all transactions:

(a) the total volume/quantity of the delivery,

(b) the unit price,

(c) the total computed price,

(d) the product identity by name, symbol, abbreviation, or code number,

(e) the date of the transaction,

(f) the identity of the seller, and

(g) except for cash-activated sales, the identity of the purchaser

This proposal would establish requirements for a recording element and the specific transaction information to be recorded by retail motor-fuel dispensers which accept cash, credit cards and debit cards.

Industry expressed concern that the proposed language might be interpreted as requiring each device to be equipped with a separate ticket printer. However, a clear consensus could not reached on the appropriate language which would clarify the exemptions to the requirement. Consequently, the S&T Committee changed the item to informational status to allow additional study of the item.

Comments from the NCWM S&T Committee at the Annual Meeting indicate a desire to see that the requirements in UR.3.4.1. be consistent with the criteria in NCWM Publication 14. Further discussions at the Annual Meeting indicate the possibility of addressing these issues by modifying S.1.6.7. rather than UR.3.4.1., thus making it a design requirement.

The Sector was asked to review this issue so that its comments could be forwarded to the S&T Committee for consideration.

Discussion: The Sector recognized that the customer and seller identification and date are already mandated by federal and banking regulations. There was concern that the wording in Handbook 44 Section 3.30 paragraph S.1.6.7. applies only to electronic cash registers and should be modified to apply to cash activated systems. Additional concern was expressed that if UR.3.4.1. is adopted as a user requirement it may not cover NTEP devices. The Sector agreed that NTEP criteria should reflect Handbook 44 requirements, and the Sector decided to recommend to the S&T Committee that the recorded transaction information apply at all points where dispenser transactions are activated.

Conclusion: The Sector agreed to modify the current checklist, Section 8.22, by deleting any additional items that are not part of the required information covered in Handbook 44 paragraph S.1.6.7. (S.1.6.7. requires total volume, unit price, total computed price, and product identity on the printed ticket.) In addition language from Section 8.22 of the Liquid-Measuring Devices Retail Motor-Fuel Dispensers regarding customer receipt information should be added to Section 18 the Cash-Acceptor Checklist.

The Sector recommends that the NCWM S&T Committee modify S.1.6.7. to clarify that point-of-sale system requirements apply to receipts printed by cash-, credit card-, and debit card-activated systems. The Sector also recommends the S&T Committee amend UR.3.4. so that it is consistent with S.1.6.7. However, the Sector asks that consideration be given to the impact of such a change on older equipment since S.1.6.7. is nonretroactive. The Sector notes that if the S&T Committee should consider deleting UR.3.4. then this action may not ensure that the customer is provided with printed receipts on older equipment because of the nonretroactive status of S.1.6.7.

The Sector supports the proposal submitted by the Western Weights and Measures Association to the NCWM to modify S.1.6.7. to make an exclusion for fleet sales and other price contract sales; to include cash- and card- activated devices in the requirement; and to add specific device number(s) to the information if applicable.

12) NTEP Testing for Low Product Sensors/Indicators in Retail Motor-Fuel Dispensers with Blending Capability

Background: When one of the component grades of fuel necessary for a blended-product retail motor-fuel dispenser to produce an intermediate grade of product is not available, then the dispenser should not deliver a single grade product.

It is possible that in the past NTEP participating laboratories performed specific test procedures designed to evaluate whether retail motor-fuel dispensers clearly indicate during delivery that the proper blend was not possible. However, these procedures were never incorporated into a checklist procedure in Publication 14.

The Sector was asked to consider an additional test procedure to verify that retail motor-fuel dispensers with blending capability indicate low or insufficient product to complete a transaction.

A possible procedure the Sector may wish to consider is:

X. Retail Motor-Fuel Dispensers with Blending Capabilities

In addition to the Common and General Code Criteria and applicable sections of the Retail Motor-Fuel Dispensers and other Checklists, the following applies to tests of Retail Motor-Fuel Dispensers with Blending Capabilities.

When the blend selector is activated and the customer has started dispensing product, if one or more grades of product are not available to provide sufficient product to complete any portion of the transaction the device should indicate this condition. To determine if the device is capable of the appropriate response, an attempt should be made to restrict the flow of a product grade. In the event that one of the product grade components is not available the dispenser one or more of the following must occur:

1. Product dispensed from the nozzle may be reduced in flow rate (i.e., less than one gallon per minute).

2. Retail Motor-Fuel Dispenser Display shall clearly indicate low product.

3. Retail Motor-Fuel Dispenser shall not operate until product storage has been returned to sufficient levels.

Discussion: It was noted that the problem with dispensers which continued to deliver a single product instead of the selected intermediate grade occurred only sporadically in the past and was associated with fixed blenders. Participating NTEP laboratories have conducted tests to detect this problem and to verify the correct product ratio; however, no testing was performed to determine product quality. It was noted that not all jurisdictions conduct tests on blend valves. Several manufacturers present indicated they no longer manufacturer mechanical blend valves and the electronic blend valves are capable of monitoring and adjusting the product ratio; however, once the ratio is outside of the adjustable range, the dispenser shuts off.

Conclusion: After being advised by manufacturers present that mechanical blend valves are not offered on new devices, the Sector decided to remove this item from its agenda. NTEP will revisit this issue if it continues to receive reports of problems with devices that have blending capability which deliver a single product grade instead of the intermediate grade that has been selected or if NTEP receives submissions of devices using mechanical blend valves.

13) Expanded Checklist Procedures for Testing with Small Volume Prover Standards

Background: NTEP permits evaluation of device performance with small volume prover standards. Publications are being finalized to address small volume prover use as a standard. Because of the complexity of this equipment and the importance of the operational procedures to be followed the Sector was asked to consider incorporating specific test criteria (e.g., minimum runs for each flow rate) in Publication 14 checklist procedures.

The Sector considered the following proposal for conducting type evaluation tests of devices with a small volume prover reference standard.

X. Evaluation with Small Volume Prover Standards

The following tests are considered to be appropriate when using a small volume prover standard:

Test Drafts. The delivered quantity should be equal to at least the quantity that is delivered by the device in one minute at the maximum flow rate and shall not be less that 50 gallons.

Test Data. A minimum of five consecutive proving runs with a maximum deviation of 0.05 percent in repeatability should be performed for each of the minimum recommended tests at each different flow rate across the range of flow of the meter.

All data points must fall within the maximum permissible error limits.

Discussion: Publication 14 does not currently have any established test procedures (such as specified test runs or methods of use) when a small volume prover is the reference standard to ensure consistency in the type evaluation process. In addition, there are some terms that may need to be clearly defined in the publication; for instance, what is meant by "test run" and "test draft." Discussions by the group indicate that it is not the size of the draft but the initial stabilization of the pulse signal, flow rate and temperature prior to starting a test run that is most important. Canada noted that it considers the design and type of meter under evaluation in determining the appropriate number of test runs. It was noted that the operation of the small volume prover is operator dependent. One caution from Canada is that there is a point where the number of passes tends to cancel the effect of error in the meter because the errors average out in the data analysis. Additionally, a large number of runs may not be appropriate to determine meter repeatability. Also discussed was whether or not the data used is from consecutive runs or randomly sampled. Canada, in working with a small volume prover manufacturer, has developed a table of the minimum and maximum number of passes to be run on a given meter type. Canada also noted that there are special issues that need to be addressed with respect to the method of averaging data that are dependent on the particular meter type when using the small volume prover as a reference standard.

Conclusion: The Sector will consider the Canadian and API recommended test procedures for the use of small volume provers. NTEP laboratories will try the Canadian and API criteria on an ad hoc basis and report on their findings at the next Sector meeting. John Skuce (Smith Meters) and Johnny Parrish (Brooks Instrument) will review the NTEP criteria once it is established.

14) Changes to Section 3.37 Mass Flow Meters Section Paragraphs A.1. and S.1.3.1. Handbook 44 to Include Units of Volume

Background: Schlumberger Industries has noted that the Coriolis mass flow meter has been accepted for both mass and volume indication in other countries and has submitted a proposal to the regional Weights and Measures Associations to consider this proposal for recognition in Handbook 44. They indicate that a mass flow meter determines volume measurement from the mass measurement, after factoring in product density. In addition, volume measurements determined by the device are not affected by product viscosity or temperature, because the mass flow meter does not contain any moving parts, thus eliminating the slippage that occurs in other types of meters. They have proposed the following changes to Handbook 44:

A.1. Liquids. - This code applies to devices that are designed to dynamically measure the mass or volume of liquids. It also specifies the relevant examination and tests that are to be conducted.

S.1.3. Units. -

S.1.3.1. Units of Measurement. - Deliveries shall be indicated and recorded in grams, kilograms, metric tons, pounds, ~~or~~ tons, or liters, gallons, quarts, pints, and decimal subdivisions thereof. The indication of a delivery shall be on the basis of apparent mass versus a density of 8.0 g/cm^3.

Discussion: During discussions at the Sector meeting, some concerns were expressed over whether the mass flow meter would display in gross or net volume. Canada indicated it felt that if the volume measurement is influenced by the meter conditions then any changes in product density should be compensated for automatically. This process would not preclude a net volume indication and could be done through the controllers which are capable of performing automatic density compensation. One manufacturer indicated that the they did not intend to indicate in net gallons because that function would be performed by other manufacturer's associated equipment.

Comments on testing of these device indicate that the method of calibration may dictate which mode is appropriate for testing. Canada indicates that the accuracy of indications may be affected if the densitometer is incorrectly calibrated; therefore, it would be desirable to verify that parameter. In addition, density is affected by the temperature, which should be referenced when verifying the density reading. The Sector was asked what equipment is necessary to perform a field test of the device. One device manufacturer recommended a scale and pycnometer; however, it was pointed out that this would require obtaining a product sample and that may be difficult and impractical to accomplish in field applications. It was therefore recommended that volume may be the preferred method of testing. It was suggested that for NTEP, mass, density, volume and temperature should be verified for devices capable of mass and volume indication.

The group was advised that the Western had left this item informational because of the lack of information on the indications on the automatic densitometer and net volume.

Conclusion: The Sector supports the following proposed changes to the Mass Flow Meters Code Section of Handbook 44 submitted by Micro Motion:

A.1. Liquids. - This code applies to devices that are designed to dynamically measure the mass or mass and density of liquids. It also specifies the relevant examination and tests that are to be conducted.

S.1.3. Units. -

S.1.3.1. Units of Measurement. - Deliveries shall be indicated and recorded in grams, kilograms, metric tons, pounds, ~~or~~ tons, and/or liters, gallons, quarts, pints, and decimal subdivisions thereof. The indication of a delivery shall be on the basis of apparent mass versus a density of 8.0 g/cm^3. The volume indication shall be based on the mass measurement and an automatic means to determine and correct for changes in product density.
(Amended 1993 and 1997)

The Sector recommends the NCWM S&T Committee examine the impact that the proposed changes will have on field test procedures and make necessary provisions to ensure that the field official has adequate information to perform testing on these devices.

15) Changes to Section 3.30 Liquid-Measuring Devices Code to Require Full Computing-Type Retail Motor Fuel Devices

Background: Proposed changes are being recommended to the regional weights and measures associations by California to require that retail motor-fuel devices (except fleet sales and other price contract sales) be of the computing type.

California has noted a number of inquiries as to the suitability of volume-only dispensers in direct sale applications. In those installations it appears to be unreasonable to expect the retail customer, who usually purchases a predetermined monetary amount, to calculate the quantity-value which should be delivered for each transaction. Additionally this type of installation might require the owner/operator to perform similar calculations, thus further increasing the potential for mathematical errors.

Initially retail motor-fuel dispensers did not have the capability to compute the total price for all sales, when cash/credit pricing, multi-tier pricing and motor-fuel prices above $1.00 per gallon were first introduced. These situations resulted in a number of complaints being lodged with weights and measures officials. California has further concerns with customer delays, confusion and their inability to verify billing information. Currently station owners in direct sales application have full computing type dispensers in operation. To permit the installation of noncomputing dispensers in direct sales applications would create a competitive disadvantage to station operators who have invested in and are maintaining computing type devices.

California is recommending the following requirement be included in other code sections where there are retail motor fuel applications, such as LPG.

> S.1.2.1. Retail Motor-Fuel Dispensers. - <u>Except for fleet sales and other price contract sales, retail motor-fuel devices shall be of the full computing type and shall indicate the quantity, the unit price, and the total price of each delivery.</u> Deliveries shall be indicated and recorded, if the device is equipped to record, in liters or gallons and decimal subdivisions or fractional equivalents thereof.

The Office of Weights and Measures has periodically received inquires as to the suitability of noncomputing retail motor-fuel dispensers for use in which sales are offered to the general public. OWM's response has been and continues to be that dispensers in an application for sales to the general public should be equipped with computing capability.

The rationale for the OWM position is consistent with that of California and reflects its concerns in the following areas: 1) suitability of equipment which require the user/customer to determine the correct quantity of product for the price charged; 2) facilitation of fraud through the use noncomputing devices in sales to the general public may introduce errors into sales transactions when calculations must be performed to verify the quantity of product; that error increases with the use of analog devices, historically with prices over $1.00 per gallon and in instances where there are products offered at more than one price; 3) the specific information which is now required fosters customer understanding of the conditions of the sales transaction (e.g., cash/credit applications), thus resulting in better value comparison; and 4) the deviation from customary practice to allow volume only dispenser would accommodate a small segment of the market, however, there is a significant sector that has strived to meet current Handbook 44 requirements that would now be placed at a competitive disadvantage.

This proposal was recommended to the regional weights and measures associations to change Handbook 44 to require computing type devices for direct sale applications, with an exclusion from the requirement for fleet sales and other price contract sales operations. The Sector is being asked to review the proposal for its recommendation on the requirement to the S&T Committee.

Conclusion: This item was tabled due to lack of time.

16) Change in NTEP Administrative Fee Structure; Policy Concerning Reanalysis of Application

Background: These items are included to update the Sector on changes to the Administrative Process under NTEP. No action is required on the part of the Sector.

a) Change in NTEP Administrative Fee Structure

NTEP processing fees have been restructured to better reflect the actual administrative costs for processing applications submitted to NTEP and for processing Certificates of Conformance (CC). The overall administrative cost for obtaining an NTEP CC has not increased, but have been itemized to now include an application fee. This fee is assessed from all applicants to cover the initial costs incurred in processing and analyzing application information. An additional fee is assessed upon successful completion of testing and/or analysis to recover costs for the labor required to issue certificates for devices which complete the NTEP process.

The new fee structure which became effective July 15, 1996 is outlined below:

Non-Refundable Application Fee	$ 175
CCs Drafted and Processed by NIST	$ 375
CC Processing Only (for CCs Drafted by a Participating NTEP lab)	$ 125

*NOTE: Laboratory labor is billed separately by Participating NTEP labs and some labs may charge a CC drafting fee.

- Application Fees must be submitted with the application in order to begin processing. Checks should be made payable to DOC/NIST.
- The Application Fee is non-refundable should a manufacturer decide to withdraw the application at any point in the process for whatever reason.
- If an open file has no activity within 90 days, the application will be withdrawn; the Application Fee is non-refundable. Once the application is withdrawn and the file is closed, the manufacturer must reapply and submit another Application Fee in order to pursue a Certificate of Conformance for the device.
- Note that there is no overall change in cost from the previous fee structure to manufacturers who ultimately receive a CC for their device (e.g., the $175 application fee plus the $375 drafting and processing fee is equivalent to the previous fee structure charge of $550 for the same services).
- Fees assessed by the participating NTEP laboratories still apply.

b) **Policy Concerning Reanalysis of Application**

New guidelines have been established to curb the high incidence of cases in which manufacturers change device parameters after completion of the testing process. These changes create delays for other manufacturers who are in the queue waiting their respective evaluation and incur additional labor costs which cannot easily and fairly be recovered.
The following policies became effective July 15, 1996:

- The manufacturer is to indicate on the application at the time of submission all of the parameters (capacity, size, features) that are being requested for inclusion on any CC resulting from the NTEP Evaluation.
- Once testing is completed according to the parameters listed in the application and an "Effective" CC number has been assigned, the following applies:

  If a request is made to add parameters to the CC ***and*** such parameters would require additional testing or reanalysis, the manufacturer must either: (1) Approve the draft CC which covers the parameters originally requested and submit a new application requesting the additional testing. A new application fee must be submitted with the application. OR (2) Relinquish the CC number assigned to the original application. A new CC number will be assigned upon completion of the additional testing or reanalysis.
- For requests to add parameters which do *not* require additional testing or reanalysis and which are allowed within the NTEP technical policies, the additional parameters can be covered on the CC at the time that the draft is prepared.

Conclusion: This item was tabled due to lack of time.

17) Definition of System Controller as Used in the Audit Trail Criteria

Background: Effective January 1, 1996, devices with remote configuration capability (Category 2) may provide access to the event counters for sealable parameters through the individual device or through the system controller, as noted in the table below. There are many devices in which a physical seal must be broken at one component while actual changes to a sealable parameter are performed at a separate component. The advent of new technology has created unlimited possibilities in remote communication from modems, laptops and handheld units, which may conceivably be configured as the system controller. It may be more appropriate to consider the inherent differences of how system controllers are interfaced with the different types of device technology rather than use a standardized or generic approach on how they are to operate.

Although the "system controller" is a component which may undergo type evaluation and subsequently receive a Certificate of Conformance (CC); there is no established policy addressing how it shall function nor has it been defined. There are installations which do not permit access to all sealable parameters either at the device or system controller. For instance, the adjustments to a retail motor-fuel dispenser measuring element are performed at the dispenser, while changes in the units of measurement are made at the console, which is usually a permanent on-site fixture and has been considered a "system controller."

Table S.2.2. Categories of Device and Methods of Sealing	
Categories of Device	*Method 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. *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 and 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.]** *[*Nonretroactive as of January 1, 1996]*
Category 3: Remote configuration capability access may be unlimited or controlled through a software switch (e.g., password)	*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 through the device or through another on-site device. The event logger shall have a capacity to retain records equal to ten 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 and enforceable as of January 1, 1995.]
(Table added 1993) (Amended 1995)

A specific example was presented to NTEP in which a motor-fuel dispenser could be configured remotely using a laptop computer, but access to remote configuration was enabled through hardware on the device. Consequently, the device falls under Category 2 sealing requirements. As noted above, for Category 2 devices, the event counters may be located at the individual device or through a system controller. Locating the event counters in the system controller was permitted to recognize that service station consoles and other system controllers such as loading rack meter controllers may be used to configure multiple devices and locating the information in one central location was desirable.

In the example presented, the company elected not to enable access to the event counters at the individual device, but rather through the laptop computer. Since personal computers are often used as service station consoles, this approach was not inconsistent with other devices that have been evaluated by NTEP. However, in this specific example, the laptop computer was not interfaced with all of the other dispensers at the site. In order to view the audit trail information, it would be necessary to physically connect the laptop to each individual dispenser.

NTEP does not believe that this approach meets the intent of the S&T Committee when the Committee allowed the use of the system controller for maintaining the counters for Category 2 devices. It was not intended that an inspector would have to physically plug a laptop into individual devices in a station. There is also concern over the possibility that the inspector might damage the equipment if the connections are not made correctly.

The S&T Committee was polled to determine whether or not NTEP's interpretation was correct. The Committee agreed with the interpretation. During the course of evaluating this issue, however, there has been some question raised as to what constitutes a "system controller", and it has been suggested that consideration be given to proposing a definition for "system controller."

The Sector reviewed this issue to provide input on whether or not a definition might be needed and whether or not any changes might be needed to the current criteria for sealing.

Conclusion: This item was tabled due to lack of time, however it was forwarded to the NCWM Specifications and Tolerances Committee for an interpretation of system controller.

ADDITIONAL DISCUSSIONS:

Future Meetings
A recommendation was made that an additional sector meeting be held in conjunction with one other regional weights and measures association meeting because of the length and complexity of the issues on this year's agenda.

Sector Issues
The Sector is sometimes asked to address NCWM-related issues which are not under the direct purview of the Sector, but the development of which would benefit from input from the Sector. For example, an issue which appears on the NCWM S&T agenda. These items are prefaced with a notation that they are being addressed by a separate committee and are only intended to be addressed by the Sector if time permits. These issues are brought to the Sector for discussion because it appears to be the best means to optimize the expertise of an assembly of both the private and public Conference membership who are impacted by and have knowledge of the technical aspects surrounding these issues. The Sector chairman has the final responsibility to decide which items on the tentative agenda are to appear in the Sector's final agenda.

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Measuring Sector - October 19-20, 1996

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Appendix M

National Type Evaluation Technical Committee
Near-Infrared Grain Analyzer Meter Sector
September 9, 1996, Kansas City, MO

Meeting Summary

Agenda Items

1. Update on National Type Evaluation Testing Schedule
2a. Proposed Change to Publication 14 - Sample Temperature Sensitivity
2b. Proposed Change to Publication 14 - Instrument Temperature Sensitivity
3. Proposed Change to Publication 14 - Power Supply Test
4. Report on Field Survey
5a. Phase II Testing - On-going Calibration Review, Proposed Addition to Publication 14
5b. Phase II Testing - Validation of Calibration Changes
*6. Report on NCWM Annual Meeting
*7. Proposed Change to H44 - S.2.6. Provisions for Sealing
*8. Review of Sector Membership
*9. Time and place for next meeting

Note: Because of common interest, items marked with an asterisk (*) were considered in joint session of the NIR Grain Analyzer and the Grain Moisture Meter Sectors.

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1. Update on National Type Evaluation Testing Schedule

Dr. Richard Pierce, Grain Inspection, Packers and Stockyards Administration (GIPSA), formerly FGIS, reported that the GIPSA Laboratory in Kansas City has not yet been certified as the NTEP participating laboratory for near-infrared grain analyzers. The certification process is on hold pending retrieval of all samples required for type evaluation testing from GIPSA's vast sample base. Formal certification is now expected in early 1997. In anticipation of certification, the GIPSA Laboratory sent a letter to NIR instrument manufacturers soliciting interest in a pre-evaluation calibration data collection program Of the five manufacturers responding, three indicated that they might be interested in participating in such a program this fall. Dr. Pierce explained that the main sample base for this program would include samples which GIPSA had used in calibrating the official instruments. These samples would be supplemented with high moisture samples obtained from the moisture meter program. He anticipated that each wheat class would be represented by approximately 100 samples. Manufacturers (not already enrolled in the NTEP moisture meter program) wishing to participate in the pre-evaluation program this fall were urged to submit instruments now so that lab technicians could become familiar with their operation.

2a. Proposed Change to Publication 14 - Sample Temperature Sensitivity

Discussion: The first paragraph under heading **II. Sample Temperature Sensitivity** of the Near-Infrared Grain Analyzer Check List of Publication 14 states that the tests will be conducted using HRW wheat samples. This is in conflict with the second paragraph which calls for testing using two sample sets from each of the six wheat classes representing low (10-11%) and high (13-14%) moisture ranges with each set consisting of three samples, one from each of three protein ranges (the upper third, middle third, and lower third of the protein range for the class). Because sample temperature sensitivity is calibration dependent, this test must be conducted using each class for which certification is being sought.

The necessity for testing using each of up to six wheat classes is not without problems, however. The NTEP Lab applicant has experienced difficulty in obtaining complete sets of high moisture samples for those classes of wheat less frequently traded and those grown in more arid regions. The Lab had asked the Sector to consider if tempered samples might be used for this test. Ole Rasmussen, Foss Food Technology, presented data supporting the use of tempered samples. For the sample temperature sensitivity test this data (see attachment) showed that biases using tempered samples were 0.1 greater at cold temperatures and 0.09 less at hot temperatures compared to biases measured before the samples were tempered. The Sector discussed concerns raised by Richard Gonzales, Oklahoma Bureau of Standards, in a memo sent to G. Diane Lee, NIST/OWM. Mr. Gonzales had experienced problems with stability and spoilage when using tempered samples for testing devices. The Sector noted that in the case of the Sample Temperature Sensitivity Tests, the maximum moisture required is only 14 percent, while the dry samples are typically 8-9 percent. Sector members with experience in tempering were of the opinion that stability and spoilage would not be problems if

the samples were properly tempered and properly stored. It was also noted that these samples would be used only for the Sample Temperature Sensitivity type approval test and not for field testing where proper storage of samples could be a problem. The Lab explained that the majority of samples used for this test would be naturally moistened. Considering that this test is applicable only to differences in NIR protein measurements (cold-room temperature and hot-room temperature), the Sector approved the use of tempered samples where naturally moistened samples were not available. The Sector requested the Lab to document the tempering procedure which would be used. [Note: The Sector does NOT approve the use of tempered samples for field testing.]

Also, as published (May 1996), this test specifies a single value for ΔT, implying symmetrical differences about room temperature. This issue was addressed by the Grain Moisture Meter Sector in their September 1995 meeting, at which time the corresponding paragraph in the GMM check list was modified to permit non-symmetrical temperature differences. At that same meeting, noting the difficulty in obtaining meaningful test results at temperatures in excess of 45 °C, the GMM Sector agreed that the maximum test temperature involving grain would be 45 °C.

Decided: The Sector approved the following changes to the Sample Temperature Sensitivity test of Publication 14, Chapter 7, to address the various issues noted above and to bring the NIR Check List into closer agreement with the GMM Check List.:

II. Sample Temperature Sensitivity

Testing is required to verify that accurate results are provided when the sample and instrument are at different temperatures. This will be referred to as the sample temperature sensitivity test. ~~The sample temperature sensitivity test will be conducted using HRW wheat samples.~~ Tests will be conducted with the instrument at room temperature and the sample temperature varying from room temperature ~~$+\Delta T$~~ $\pm\Delta T_H$ to room temperature ~~$-\Delta T$~~ $-\Delta T_C$ ~~, where ΔT is the maximum allowable difference between instrument and sample temperatures specified by the manufacturer.~~ where ΔT_H is the manufacturer specified difference for grain above room temperature, and ΔT_C is the manufacturer specified difference for grain below room temperature. In no case will room temperature $+\Delta T_H$ be allowed to exceed 45 °C, but ΔT_H need not equal ΔT_C.

Testing will be conducted using two sample sets from each of the six wheat classes representing low (10-11%) and high (13-14%) moisture ranges. Each set will consist of three samples, one from each of three protein ranges (the upper third, the middle third, and the lower third of the protein range for the class). Separate bias analyses will be made for the low and high moisture sets. When high moisture samples are not available for any protein range in any class, testing may be conducted using tempered (artificially moistened) samples. Three analyses will be made for each sample at room temperature, the hot temperature extreme, and the cold temperature extreme. The average protein for the 9 observations in each moisture set (1 moisture level x 3 protein levels x 3 replicates) run at each temperature extreme must agree with the average protein obtained for the room temperature runs within ± 0.35.

Sample Temperature Sensitivity tests will not be conducted for ground-grain NIR instruments. For whole-grain instruments, sample presentation must be the same as that which will be used in the field. Sealed cells cannot be used for the Sample Temperature Sensitivity tests.

2b. Proposed Change to Publication 14 - Instrument Temperature Sensitivity

Decided: The Sector also agreed that the section on **Instrument Temperature Sensitivity** in Publication 14, Chapter 7, should be modified to reflect the 45 °C limit discussed in agenda item 2a. above. The modification to the affected paragraph is shown below:

The "hot" temperature is defined as the upper operating limit claimed by the manufacturer. (Note: The maximum "hot" temperature claimed cannot exceed 45 °C.) The "cold" temperature is defined as the lower operating limit claimed by the manufacturer. To facilitate testing of instrument temperature sensitivity, manufacturers shall provide a means of disabling the instrument feature for suppressing the display of protein results when temperature ranges are exceeded.

3. Proposed Change to Publication 14 - Power Supply Test

Background: Following a discussion of this issue at its March 1994 meeting, the Sector agreed to change the type evaluation power supply range for NIR grain analyzers of 100 V to 130 V to the slightly narrower range of 105 V to 129 V. As a result of this recommendation, Publication 14 was changed to the narrower range, but the NIR Code of Handbook 44 was not changed. Noting this oversight, the NTEP Laboratory suggested that the Code should be brought into agreement with the Sector's recommendation. This issue was placed on the 1995 Southern Weights and Measures Association S&T Committee agenda. The Southern supported the change and the item was placed on the NCWM S&T Committee agenda for the 81st Annual meeting as item 357-1. Subsequently, the Central Weights and Measures Association requested information about this issue from the Sector's

Technical Advisor. His response was that the issue may have arisen from the request of a meter manufacturer who had older ground grain instruments in use in the field that may not meet the 100 V to 130 V range requirements. He also noted that all NIR instruments which had gone through NTEP evaluation had been submitted as moisture meters which were required to meet the wider voltage range of 100 V-130 V. The Central S&T Committee took the position that NIR grain analyzers are used in the same environment as moisture meters and therefore opposed the change. In light of this opposition by the Central, a mail ballot was sent to Sector members asking if they wished to withdraw their support for the item. By a vote of 13 to 2 (with 2 abstentions) the Sector voted to request the NCWM S&T Committee to remove the item as a voting item from the Annual Meeting Agenda. The S&T Committee acted accordingly, and the issue was removed as a voting item. As a result, the Code now specifies a voltage range of 100 V-130 V while Publication 14 specifies a voltage range of 105 V-129 V.

Decided: To bring Publication 14 into agreement with Handbook 44, the Sector approved the following change to the Power Supply Test of Publication 14:

> **Power Supply.** A single HRW wheat sample will be analyzed 10 times with the instrument operating at a nominal voltage of 117 V. The voltage will be adjusted to ~~105~~ 100 V, and after 30 minutes, the HRW sample will be analyzed 10 times. The voltage level will then be increased to ~~129~~ 130 V, and after 30 minutes, the sample will be analyzed 10 more times.
>
> Changes in bias and precision will be checked. Bias is defined as the change in the average protein for 10 analyses made at both the reference and the respective test voltages.
>
> The maximum allowable bias change from the reference is ± 0.10. The maximum allowable standard deviation of 10 analyses (precision), at any of the three voltage levels, is 0.10.

4. Report on Field Survey

To find out what might be expected when the NIR Code is enforced, Don Onwiler, Nebraska Public Service Commission, field tested 29 devices using three standard reference wheat samples provided by GIPSA/FGIS. Don reported on the results of this survey and the reaction of the participants, all of whom took part on a volunteer basis (see Attachment). Of the 29 devices tested, only 41.4 percent successfully passed all three required tests (accuracy on individual samples, average for all three samples, and range for five retests on the same sample.) Don attributes most failures to users who have not maintained their instrument, have not monitored its operation with check samples, or have no knowledge of proper calibration procedures.

5a. Phase II Testing - On-going Calibration Review, Proposed Addition to Publication 14

Background: This item first appeared on the Sector's agenda for its September, 1994 meeting. It was discussed again at length at their two meetings in 1995, and again at the March 1996 meeting. Although agreeing that participation in a monitoring program of some sort should be mandatory for NTEP instruments, the Sector has had difficulty in reaching a consensus on the exact details of such a program. The Sector was able to agree that whatever program is finally decided upon, it should be reviewed at the end of each year to assess its value and to determine if it should be continued, modified, or abandoned.

Although originally recommending that recalibration of NTEP instruments be done using (as a minimum) data obtained on samples selected from the same sample pool from which GIPSA/FGIS selected samples for calibrating the Official instrument, it has since been determined that this will not be possible in cases where GIPSA has used "historical" samples which exist only as spectral data (obtained on the GIPSA Official instrument) and not as physical samples.

[Note: As used above, "monitoring" applies to tests performed on the instruments in the NTEP lab and not to devices in the field. "Recalibration" means derivation of a new set of calibration coefficients. Slope and bias adjustments are not considered "recalibration".]

To minimize annual costs to manufacturers, an on-going monitoring program which, to the greatest extent practical, takes advantage of GIPSA/FGIS's current procedures for monitoring the official system's performance over time has been proposed. The cost for collecting and analyzing NTEP calibration performance data for all six classes of wheat has been estimated at approximately $1750 per year per instrument model for whole grain instruments (costs will be higher on instruments requiring grinding of samples).

If manufacturers submit additional samples for CNA analysis (moisture analysis will also be required to report protein on a 12% moisture basis) and collection of optical data on their instruments, Dr. Richard Pierce, GIPSA/FGIS estimated that CNA analysis would run about $15-$25 per dual analysis, with the collection of optical data an additional $3 per sample. He had no oven-

moisture cost figures at the time. He emphasized that the costs he had cited were preliminary estimates as GIPSA was presently developing a fee schedule for these types of tests. Any data paid for by a manufacturer would be proprietary to the manufacturer.

Decided: The Sector approved the addition of the following paragraph to Publication 14, Chapter 7, at the end of part

IV. Tolerances for Calibration Performance:

For the on-going review of calibrations, instrument protein results and calibration data will be collected on 100 samples per class each year on each model in the NTEP program. Eighty of these samples will be selected from the 100 calibration verification (C/V) samples on which GIPSA has obtained spectral data. The additional twenty will be selected from moisture survey samples. Existing CNA protein values will be used for the 80 C/V samples. CNA analysis will be obtained for the 20 moisture survey samples. Instruments will be required to simultaneously provide predicted proteins and spectral data. The required data will be collected over time as samples, instruments, and operators become available with the goal of providing optical and chemical data, along with a summary report comparing predicted protein values to the CNA reference analyses, to manufacturers by January 1 of each year.

5b. Phase II Testing - Validation of Calibration Changes

Background: At the Sector's previous meeting in March 1966, some Sector members were of the opinion that if a performance problem is addressed through a calibration change, a common, independent validation set (not part of the calibration set) should be available to verify that the desired objective has been achieved. One Sector member had suggested that manufacturers be allowed to contribute "golden" samples to the validation set. Another suggested that the validation set contain samples which had historically shown poor agreement with the CNA protein values. It was also suggested that it would be useful if validation samples could be identified with the residual values obtained on each model.

Discussion: After considering the practical aspects of obtaining the necessary samples and the cost of a validation program to manufacturers the Sector distilled the issue to the simple question of, "How should the NTEP lab evaluate a calibration change?"

Decided: The Sector then agreed that the answer was simply, "The same way they evaluated the calibration initially." The Sector also agreed that spectral and CNA data would be made available to manufacturers for re-predicting the results of calibration changes.

6. Report on NCWM Annual Meeting

The NCWM Annual Meeting was held July 21-25, 1996 in New Orleans, LA. Diane Lee, NIST/OWM, reported on action taken by the Conference on issues of interest to the Sector:

357-1 S.2.2.1 Power Supply, Voltage and Frequency

At the request of the Sector, this proposal to modify the power supply voltage range from 100V-130V to the narrower range of 105V-129V was withdrawn from consideration as a voting item. [Note: for further discussion of this issue see Sector agenda item 3.]

7. Proposed Change to H44 - S.2.6. Provisions for Sealing

Discussion: This became an NIR Analyzer agenda item, because the Grain Moisture Meter Sector was considering changes to the Handbook 44 paragraph dealing with Provisions for Sealing [*Note: for additional discussion on this subject, see GMM Sector Agenda Item 2]*. Because several of the devices holding Certificates of Compliance (CC's) under the GMM Code will also be submitted for evaluation under the NIR Code, it is desirable to keep corresponding provisions of the two Codes in agreement to the greatest extent possible. The Sector recognized that bias changes were likely to be more frequent during the year with NIR Grain Analyzers than with moisture meters (regardless of technology); thus, it was not reasonable to assume that the sealing requirements for Category 1 and Category 2 devices, as defined by the GMM Sector, would provide adequate security for NIR Grain Analyzers.

Decided: The Sector agreed that all NIR Grain Analyzers (measuring constituents other than moisture) should comply with the audit trail requirements for Category 3, 3a, and 3b devices as adopted by the GMM Sector. This decision results in the following changes to the NIR Code in Handbook 44:

S.2.6. Provision for Sealing. -

~~*a. 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., The device shall incorporate an audit trail available*~~

~~*at the time of inspection as defined in part (b)), before any change that affects the metrological integrity of the device can be made to any mechanism.*~~

~~*b. If the operator is able to make changes that affect the metrological integrity of the device (e.g., slope, bias, etc) in normal operation, the device shall use an audit trail. The minimum form of the audit trail shall be an event logger and 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 (for calibration changes consisting of multiple calibration constants, the calibration version number is to be used rather than the calibration constants).*~~

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 twenty-five (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.)

8. Sector Membership

In January at the Interim NCWM Meeting, members of the NTEP Board of Governors (BOG) addressed questions which had been raised concerning membership and appointment to National Type Evaluation Technical Committee (NTETC) Sectors. They agreed that membership is conferred on individuals, not companies; therefore, the resignation of an individual from a Sector does not automatically entitle the individual's company to continue Sector membership. The company may, however, nominate another individual for consideration by the NCWM Chairman, who makes all appointments to the Sectors. Although membership is conferred on individuals, the BOG reaffirmed that each individual does not necessarily have a separate vote. Only one vote per company or agency is permitted. [*Note: for additional discussion on this subject, see Publication 16, April 1966, item 102-6.*]

Subsequently, at the recent Annual Meeting, the Conference agreed to the following modification in the rule governing designation of alternate representatives at Sector meetings:

> Although the [NCWM] Chairperson will appoint members [on the advice of the Sector chairman and technical advisor], an appointed representative may designate an alternate with full voting rights for an individual meeting whenever necessary.

It has been brought to the attention of the Sector's NIST member that there have been several changes in representation which have not been appointed officially by the NCWM Chairperson. The membership status of those attending the Sector meeting, as well as those listed officially as members, was reviewed. This time only, Diane Lee will send, to the NCWM Chairperson, a single letter with the names of those desiring appointment to the Sector as voting members (if they have not previously been appointed.) Attendees were reminded that maintaining NCWM membership was a requirement for Sector membership.

The BOG had also solicited comments from the Sectors on the need for establishing criteria for the removal of Sector members who never attend Sector meetings or contribute to the activities of the Sector. The Sector did not agree on a single criteria for removal of inactive Sector members, but did suggest that a letter be sent to those who had not participated actively in Sector activities notifying them that unless they assumed an active role in Sector matters, they would lose their voting status on the Sector. The letter was also to point out that even without voting status as a Sector member, the individual could still remain on the Sector mailing list to receive Meeting Notices, Agendas, and Meeting Summaries and would always be welcome to attend the meetings.

9. Date and Site for Next Meeting

A 2-day and 1/2 day meeting (about 3/4 of a day for the NIR Protein Sector with the remaining time for the Grain Moisture Meter Sector) is planned for March 10-12, 1997, in Atlanta, GA.

[See Appendix N for the attendance list for the September 9, 1996, meeting.]

National Type Evaluation Technical Committee
Near Infrared Grain Analyzer Sector
March 10, 1997, Atlanta, GA

Meeting Summary

Agenda Items

1. Update on National Type Evaluation Testing Schedule
2. Publication 14 - Sample Temperature Sensitivity - the Use of Tempered Samples
*3. Report on NCWM Interim Meeting
*4. Changes in Sector Membership
*5. Time and place for next meeting

Note: Because of common interest, items marked with an asterisk (*) were considered in joint session of the NIR Grain Analyzer and the Grain Moisture Meter Sectors.

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1. Update on National Type Evaluation Testing Schedule

Dr. Richard Pierce, Grain Inspection, Packers and Stockyards Administration/Inspection Systems Engineering (GIPSA), reported that the GIPSA Laboratory in Kansas City had not completed the work necessary to obtain certification as the NTEP participating laboratory for near infrared grain analyzers. With limited resources, priority has been given to tasks related to maintaining the NTEP Grain Moisture Meter Program. Dr. Pierce noted that grain moisture activities peak in the Spring of the year when the data from the previous season becomes available for review. Review of the data must be accomplished in a timely manner so manufacturers have time to develop and issue revised calibrations, if needed, prior to the coming harvest. He indicated that there was no possibility of resuming work on certification and starting work on the pre-evaluation criteria before August 1997.

2. Publication 14 - Sample Temperature Sensitivity - the Use of Tempered Samples

Background: To check instruments for sensitivity to variations in sample temperature, the NIR Grain Analyzer Check List of Publication 14 calls for testing using two sample sets from each of the six wheat classes representing low (10-11%) and high (13-14%) moisture ranges with each set consisting of three samples, one from each of three protein ranges (the upper third, middle third, and lower third of the protein range for the class). Because sample temperature sensitivity is calibration dependent, this test must be conducted using each class for which certification is being sought. The NTEP Lab applicant anticipated having difficulty obtaining complete sets of high moisture samples for classes of wheat less frequently traded and those classes grown in more arid regions and had requested that the Sector approve the use of tempered samples if necessary. At the Sector's September 1996 meeting, Ole Rasmussen, Foss Food Technology, presented data supporting the use of tempered samples for this test. The Sector subsequently approved the addition of the following sentence to the Sample Temperature Sensitivity Test of Publication 14: "When high moisture samples are not available for any protein range in any class, testing may be conducted using tempered (artificially moistened) samples." In response to the Sector's request for the Lab to document the tempering procedure which would be used, tests were run at GIPSA to determine the minimum acceptable procedure for tempering samples. Rich Pierce, GIPSA, reported that the test involved splitting naturally moist samples into two portions. One portion was dried down by two percentage points, then re-wetted to the original moisture. To re-wet the dried portion, a sufficient amount of water (determined by weight calculation) was added all at one time. The re-wetted sample was mixed until all the added water had been adsorbed, then allowed to stabilize for a period. (This was thought to represent a more extreme case than misting the sample with water over a long period of time until the desired moisture was reached.) The two portions (naturally moist and re-wetted) were then to be submitted to the Sample Temperature Sensitivity Test so results could be compared. Dr. Pierce was unable to report any results because the integrity of the re-wetted samples was questionable (possible spoilage). The experiment will be repeated and results will be reported at a future meeting. [Note: The Sector does NOT approve the use of tempered samples for field testing. Tempered samples will be used ONLY for the Sample Temperature Sensitivity Test.]

3. Report on NCWM Interim Meeting

Diane Lee, NIST/OWM, reported on actions taken on NIR Grain Analyzer issues by the Specifications and Tolerances (S&T) Committee at the NCWM Interim Meeting held January 12-16, 1997, in Rockville, MD. [Note: The Item number and heading shown below correspond to the item number and heading in the Interim Meeting Agenda, NCWM Publication 15, dated December 1996. Additional discussion of these issues can be found in that publication.]

357-1 S.2.6. Provision for Sealing

Because of the possible need for user bias adjustments for NIR Grain Analyzers (measuring constituents other than moisture) the Sector had agreed that the only sealing category appropriate for NIR Grain Analyzers was one which corresponded to the audit trail requirements for Category 3, 3a, and 3b devices as proposed for Grain Moisture Meters. The Sector had recommended changes to S.2.6. to make the method of sealing for NIR Grain Analyzes correspond as closely as possible to that specified for Grain Moisture Meter Category 3. [See Interim Meeting Agenda item 356-1 for a further discussion of this issue.] The S&T Committee agreed to make the Sector's recommendations a voting issue at the National Conference in July. The Sector's recommendations are shown below:

S.2.6. Provision for Sealing. -

~~*a. 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., The device shall incorporate an audit trail available at the time of inspection as defined in part (b)), before any change that affects the metrological integrity of the device can be made to any mechanism.*~~

~~*b. If the operator is able to make changes that affect the metrological integrity of the device (e.g., slope, bias, etc) in normal operation, the device shall use an audit trail. The minimum form of the audit trail shall be an event logger and 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 (for calibration changes consisting of multiple calibration constants; the calibration version number is to be used rather than the calibration constants).*~~

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 twenty-five (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.)

Diane also related that the Scale Manufacturer's Association (SMA) had presented a report, at the Executive Committee Meeting, on the status of States which have adopted or are considering adoption of uniform regulations regarding the use of NTEP devices. Of the Continental U.S. States, only 11 have not adopted regulations regarding the use of NTEP devices. In 8 of the 11, NTEP regulations are under consideration. She noted that the SMA's primary focus is on the States which have adopted NTEP for weighing devices, so the SMA figures do not necessarily indicate the number of States which will apply NTEP regulations to NIR Grain Analyzers (when the tentative code becomes permanent) or the number of States which now apply NTEP regulations to Grain Moisture Meters.

4. Changes in Sector Membership

During the GMM/NIR Sector Meeting in Kansas City, MO September 9-11, 1996, a membership status report was distributed. It was noted that many individuals who have actively participated in Sector activities had not been formally appointed to the Sectors by the NCWM Chairman. (NTEP policy requires that all persons seeking appointment to the NTETC GMM/NIR Sectors send individual letters on company letterhead to the NCWM Chairman requesting membership on the Sectors.) In early January 1997, Diane Lee, NIST/OWM, sent out a letter urging anyone interested in becoming a voting member of the Sectors to submit the required letter.

Barbara Bloch, the current NCWM Chairman, has received letters from the following individuals. At the recommendation of the Sector Chairman and the Sector Technical Advisor, these individuals have been appointed as Sector members:

Cassie Eigenmann	DICKEY-john Corp.
Keith Lochlin	Conagra Corn Processing (representing GEAPS)
John Miller*	CSC Scientific (replacing Allison Pflug)
Ray Oberg	Zeltex Inc.
Hiro Yamahira	Kett Electric Laboratory (replacing M. Emori)

* Subsequent to his appointment, John Miller left CSC. CSC will request the appointment of Tim Conwell to replace John Miller.

In response to a question about inactive members, Ms. Lee indicated that a letter would be sent to members who have not attended Sector meetings in recent years to determine if they plan to continue their participation in the Sector as voting members. This will be done in sufficient time to allow the membership list to be updated before the Conference's Annual Meeting in July.

9. Date and Site for Next Meeting

A two-day or two and one-half day meeting (one and one-half or two days for the Grain Moisture Meter Sector and one-half day for the NIR Protein Sector) is planned for September 10-12, 1997, in the Chicago area.

[See Appendix N for the attendance list for the March 10, 1997, meeting.]

Appendix N

National Type Evaluation Technical Committee
Grain Moisture Meter Sector
September 9-11, 1996, Kansas City, MO

Meeting Summary

Agenda Items

*1. Report on NCWM Annual Meeting
*2. Proposed Change to H44 - S.2.3. Provisions for Sealing
*3. Review of Sector Membership
*4. Time and place for next meeting
5. Update on Type Evaluation and Phase II Testing
6. Proposed Addition to Publication 14 - Criteria for NTEP Calibration Review
7. Proposed Change to Publication 14 - Tolerances for Calibration Performance
8. Test Weight per Bushel Indications/Larry Engebretson, GIPSA
9. Progress Report on Compilation of Baseline Performance Data
10. Proposed Change to Publication 14 - Sample Temperature Sensitivity
11. Proposed Revision to H44 Sec. 5.56(a) -S.2.4.3. Calibration Transfer
12. Standardization of Instruments

Note: Because of common interest, items marked with an asterisk (*) will be considered in joint session of the NIR Grain Analyzer and the Grain Moisture Meter Sectors.

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1. Report on NCWM Annual Meeting

The NCWM Annual Meeting was held July 21-25, 1996, in New Orleans, LA. Diane Lee, NIST/OWM, reported on action taken by the Conference on issues of interest to the Sector [Note: For additional discussion on the issues listed below refer to *NCWM Publication 16, April 1996*; and to "Addendum Sheets to the Interim Report of the Committee on Specifications and Tolerances" for the 81st Annual Meeting] :

356-1 Elimination of Retroactive Dates; Effective for Devices Placed into Service after January 1, 1998

This item was the Sector's recommendation that the code be reorganized into two parts to address: (1) NTEP meters and any meters manufactured or placed into service after January 1, 1998; and (2) all non-NTEP meters manufactured or placed into service prior to January 1, 1998. The conference adopted the Sector's recommendations with one exception. The Sector had recommended changing the wording of the sentence "The minimum temperature difference shall be 10°C (degree Celsius)" to "The minimum temperature difference shall be 10 Celsius degrees." The S&T Committee's decision not to make this change was based on (1) NIST Special Publication 811, "Guide for the Use of the International System of Units (SI)," which recommends the use of degree Celsius (°C) for a temperature interval or a temperature difference; and (2) to remain consistent withe existing NIST HB 44 language. The new two-part code will appear in the 1997 edition of HB 44.

356-2 S.1.10 (New Section S.1.5.) Operating Temperature

The conference adopted the Sector's recommendation to modify S.1.10 to clarify that paragraph (a) applied to the Warm-up Period; and (2) that the temperature range need not be marked on the device. This paragraph will be re-numbered and will appear as S.1.5. in Part (a) of the re-organized code.

102-4 NTEP Policy: Examples of Appropriate Language to Use in Conjunction with the NTEP Name and Logo in Advertising and Brochures

The Conference approved the NTEP Board of Governors recommendation to include examples of Language to Use in Conjunction with the NTEP Name and Logo in Advertising and Brochures in Part I of Publication 14. Included in the examples is the Sector recommendation for Grain Moisture Meters shown below:

Grain Moisture Meter

The [Model XXXX] meets or exceeds the accuracy and performance requirements for Grain Moisture Meters as detailed in National Institute of Standards and Technology (NIST) Handbook 44. A Certificate of Conformance, Number XX-XXX, was issued under the National Type Evaluation Program (NTEP) of the National Conference on Weights and Measures, approving this model for commercial use on the following grains: (append list of grains for which NTEP approval has been granted for this model.)

2. Proposed Change to H44 Sec. 5.56(a) - S.2.5. Provisions for Sealing:

[Note: Paragraph S.2.3., Provisions for Sealing, of the old Code became Paragraph S.2.5. in Section 5.56(a) of the re-organized Code adopted at the NCWM 81st Annual Meeting.]

Background: When originally considering provisions for sealing grain moisture meters, the Sector concluded that physical seals would not constitute a meaningful security measure if frequent bias adjustments were required (as might be the case with multi-constituent NIR meters) and that event counters alone would not provide meaningful information on the appropriateness of the adjustment. The Sector agreed that sealing requirements for NIR based instruments should equal or exceed those specified for Category 3 devices in the Scales Code. The Sector decided that devices should either be sealed by a physical seal or , if the operator is able to make changes affecting the metrological integrity of the device, should use an audit trail consisting of an event logger which included an event counter, the parameter ID, the date and time of change, and the new value of the parameter (or the new calibration version number if the change consisted of multiple constants). At the 1995 Annual Meeting of the NCWM, H44 paragraph S.2.3., Provision for Sealing, was amended to specify the minimum information which must be contained in the audit trail. As S.2.5. is presently worded, however, the case of a device with remote configuration capability is not covered. At their March 1996 meeting, the Sector was asked to consider a change to S.2.3. *[Now S.2.5. in the revised code]* which would require any device with remote configuration capability to have an audit trail. One manufacturer objected strongly to this proposal on the basis that there was no difference, from an enforcement point of view, from breaking a seal to allow a change to be made via a device's keyboard and breaking a seal to allow a change to be made from a remote site (e.g., via modem or acoustic coupler.) It was also pointed out that there was an economic consideration in choosing a physical seal vs incorporating sufficient memory for an audit trail incorporating an event logger (memory being more expensive than a physical seal.) Several other Sector members favored requiring audit trails for devices with remote configuration capability, whether or not a seal had to be broken to enable the device to be remotely configured. At that time the Sector was unable to reach consensus on the issue.

Discussion: The Scales and Liquid Measuring Devices Codes have categorized devices and methods of sealing. The Sector considered adopting similar categories for grain moisture meters to address the issues raised at the previous Sector meeting. The distinction between a Category 1 device and a Category 2 device (as applied to moisture meters) was not immediately clear. One member suggested that it seemed to be a matter of accountability, with a Category 1 device, the user has direct knowledge of the information being keyed into the device once a seal is broken. With a Category 2 device, however, once the seal is broken the user may only know that "some information was sent to the device by modem (or computer)." There was substantial discussion as to whether a Category 2 device should require ***both*** a physical seal ***and*** event counters or ***either*** a physical seal ***or*** event counters. There were those who felt that event counters were preferable to a physical seal for moisture meters which might be inspected before calibrations were available for the coming harvest. In which case, it would be a full year before that meter was inspected again. With a physical seal as the only security, the meter might go un-sealed for the entire time with no record of what changes may have been made. A poll of W&M members showed that very few jurisdictions were actually applying tamper proof physical seals. The Sector decided to follow the lead of the Scales code and allow ***either*** a physical seal ***or*** event counters for Category 2 devices.

Decided: The Sector recommends the following changes to **H44 - Sec. 5.56(a). Grain Moisture Meters** including the addition of Table S.2.5. [Editor's note: To ensure legibility, the text in table S.2.5. has not been underlined to indicate it is an addition. The entire table is to be treated as an "addition.")

S.2.5. Provision for Sealing

~~(a)~~ 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 ~~part b~~ Table S.2.5.), before any change that affects the metrological integrity of the device can be made to any mechanism.

~~(b) If the operator is able to make changes that affect the metrological integrity of the device (e.g., slope, bias, etc.) in normal operation, the device shall use an audit trail. The minimum form of the audit trail shall be an event logger and 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 (for calibration changes consisting of multiple constants, the calibration version number is to be used rather than the calibration constants.)~~

~~The device is not required to display this information, but a printed copy of the information must be available through another on-site device. The event logger shall have a capacity to retain records equal to twenty-five (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.)~~

[Note: Zero-setting and test point adjustments are considered to affect metrological characteristics and must be sealed.]

Table S.2.5. Categories of Device and Methods of Sealing

Categories of Device	*Method of Sealing*
Category 1: No remote configuration capability	*Seal by physical seal.*
Category 2: Remote configuration capability, but access is controlled by physical hardware *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 remote configuration.*	*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 and one for configuration parameters. If equipped with event counters, the device must be capable of displaying, or printing through another on-site device, the contents of the counters.*
Category 3: Remote configuration capability access may be unlimited or controlled through a software switch (e.g., password)	*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 twenty-five (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	*Same as Category 3*
Category 3b: No remote capability, but access to metrological parameters is controlled through a software switch (e.g., password)	*Same as Category 3*

3. Review of Sector Membership

In January at the Interim NCWM Meeting, members of the NTEP Board of Governors (BOG) addressed questions which had been raised concerning membership and appointment to National Type Evaluation Technical Committee (NTETC) Sectors. They agreed that membership is conferred on individuals, not companies; therefore, the resignation of an individual from a Sector does

not automatically entitle the individual's company to continue Sector membership. The company may, however, nominate another individual for consideration by the NCWM Chairman, who makes all appointments to the Sectors. Although membership is conferred on individuals, the BOG reaffirmed that each individual does not necessarily have a separate vote. Only one vote per company or agency is permitted. [*Note: for additional discussion on this subject, see Publication 16, April 1966, item 102-6.*]

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It has been brought to the attention of the Sector's NIST member that there have been several changes in representation which have not been appointed officially by the NCWM Chairperson. The membership status of those attending the Sector meeting, as well as those listed officially as members, was reviewed. This time only, Diane Lee, NIST/OWM will send to the NCWM Chairperson, a single letter with the names of those desiring appointment to the Sector as voting members (if they have not previously been appointed.) Attendees were reminded that maintaining NCWM membership was a requirement for Sector membership.

The BOG had also solicited comments from the Sectors on the need for establishing criteria for the removal of Sector members who never attend Sector meetings or contribute to the activities of the Sector. The Sector did not agree on a single criteria for removal of inactive Sector members, but did suggest that a letter be sent to those who had not participated actively in Sector activities notifying them that unless they assumed an active role in Sector matters, they would lose their voting status on the Sector. The letter was also to point out that even without voting status as a Sector member, the individual could still remain on the Sector mailing list to receive Meeting Notices, Agendas, and Meeting Summaries and would always be welcome to attend the meetings.

4. Time and place for next meeting

A two-day and one-half day meeting (about three fourths of a day for the NIR Protein Sector with the remaining time for the Grain Moisture Meter Sector) is planned for March 10-12, 1997 in Atlanta, GA.

5. Update on Type Evaluation and Phase II Testing

Rich Pierce of the Grain Inspection, Processors and Stockyards Administration (GIPSA, formerly FGIS), the NTEP laboratory for Grain Moisture Meters, reported that a Certificate of Conformance (CC) number had been issued for the Motomco 919E, bringing the total number of instruments in the Phase II Calibration Review program to six. One Sector member complained that CC's had not been printed for devices which had been granted CC numbers some time ago. Dr. Pierce acknowledged that the NTEP lab was overdue in forwarding the necessary final reports to NIST. Several device manufacturers noted that this situation gave a marketing advantage to those companies fortunate enough to have printed CC's available for their devices.

Regarding the collection of Phase II data on 1996 crop, Dr. Pierce reported that a late wheat season with fewer samples than normal had delayed collection of data until well into July. The lab's goal for releasing wheat data to manufacturers is November 30.

6. Proposed Addition to Publication 14 - Criteria for NTEP Calibration Review

Background: In connection with annual review of calibrations, the NTEP laboratory has noted that additional criteria are required to assist in evaluating calibrations when there is an insufficient number of samples in any two-percent range and when manufacturer supplied data is involved. To address these issues, criteria were developed on May 31, 1996 by Rich Pierce, Jim Rampton, and Dave Funk, all of GIPSA. These criteria (except for Case VII.B.) were applied along with criteria listed in Publication 14 to determine "approved" and "pending approval" moisture ranges for the 1996 calibration review and certificate update. The proposed Appendix C defines the "Standard data format" specified in the criteria.

Discussion: Questions were raised regarding Case I-A which would seem to imply that a calibration could be classified as "not approved" based on the results of a single sample. It was pointed out that this criteria applied only to the end 2 percent intervals. It was further noted that Phase II data: (1) is cumulative from year to year; and (2) for calibrations already classified as "pending" includes manufacturer supplied data (subject to the conditions of Case VII for that range, and, therefore, is not subject to conditions of Case I-A. The main purpose of Case I-A is to make it clear that moisture ranges will not be extended (even as "pending") based on data obtained on a single sample.

Decided: The Sector approved the addition of the following criteria and Appendix C to the Grain Moisture Meter Check List of Publication 14, Chapter 6.

V. Criteria for NTEP Moisture Calibration Review

The following criteria are to be applied along with criteria listed in Part IV, above, to determine "approved" and "pending approval" moisture ranges.

Special Cases Dealing with Inadequately Represented Moisture Intervals:

Case I. A single sample appears in a 2 percent moisture interval that is at the end of the calibration data range.

A. If the sample bias is outside the approval tolerance, the calibration is "not approved" in that moisture interval.

B. If the sample bias is within the approval tolerance, the calibration is "pending approval" in that moisture interval.

Case II. The samples in a 2 percent moisture interval at the end of the calibration data range do not represent at least one-fourth of the moisture range. For example, there are no samples with a moisture content greater than or equal to 18.5 percent in the 18 percent to 20 percent moisture interval.

A. If the average bias for the samples is outside the approval tolerance, the calibration is "not approved" in that moisture interval.

B. If the average bias for the samples is within the approval tolerance, the calibration is "pending approval" in that moisture interval.

Case III. There are two or more consecutive 2 percent moisture intervals at the end of the calibration data range that each contain only one sample. (Similar to Case I.)

A. If the bias for each 2 percent interval is within the approval tolerance, the calibration is "pending approval" for those moisture ranges.

B. If the bias for any of the inner intervals is within the approval tolerance, apply the criteria for Case I to successive intervals working in from the ends of the calibration range.

C. If the bias for the outer interval is within the approval tolerance but the bias for an inner interval is not, the calibration is "not approved" beyond (and including) the innermost interval that is determined to be "not approved" when applying the criteria for Case I.

Case IV. A 2 percent moisture interval that contains no data points is bordered by intervals with data points.

A. The calibration approval status for the empty interval is the same as that for the outer bordering interval.

Case V. A 2 percent moisture interval that contains one data point is bordered by intervals with more than one data point.

A. If the bias for the single point is within the approval tolerance and the bias for samples in the adjoining outer interval is within the approval tolerance, the calibration is "approved" for the interval with the single sample.

B. If the bias for the single point is within the approval tolerance and the bias for samples in the adjoining outer interval is within the pending approval tolerance, the calibration is "pending approval" for the interval with the single sample.

C. If the bias for the single point is within the approval tolerance and the bias for samples in the adjoining outer interval is outside the pending approval tolerance, the calibration is "pending approval" for the interval with the single sample.

D. If the bias for the single point is within the pending approval tolerance and the bias for samples in the adjoining outer interval is within the pending approval tolerance, the calibration is "pending approval" for the interval with the single sample.

E. If the bias for the single point is outside the approval tolerance and the bias for samples in the adjoining outer interval is outside the pending approval tolerance, the calibration is "not approved" for the interval with the single sample.

General Considerations

Case VI. All "approved" and "pending approval" calibration ranges listed on certificates of conformance will begin and end with even numbers.

Case VII. Manufacturers may submit supplementary data to extend calibration "pending approval" ranges beyond available NTEP moisture ranges; however, **beginning with the 1997 calibration review and certificate update, only manufacturer data supplied in the standard data format, as defined in Appendix D, will be considered when determining calibration ranges and pending approval status.**

A. Calibration status for any range can be no better than "pending approval" when based solely on manufacturer data.

B. Manufacturer data supplied earlier in graphical or non-standard format must be re-submitted in standard data format. Failure to supply data in standard format may result in withdrawal of "pending" status if data collected by the NTEP lab is not sufficient to support use of the calibration for the range claimed.

Appendix C - Standard Data Format for Submitting NTEP Meter Data for Calibration Review

1. Data fields:

Sample I.D.	Meter Moist.	A.O. Moist.	Meter Model	Meter S.N.	Calibration I.D.	Grain Type	Crop Year

2. Description of data fields.

- Sample I.D. The unique sample number assigned by FGIS.
- Meter Moist. The meter-predicted moisture.
- A.O. Moist. The FGIS air oven moisture result.
- Meter Model. The name of the model submitted by the manufacturer.
- Meter S.N. The instrument serial number assigned by the manufacturer.
- Calibration I.D. The unique name or number of the calibration used to predict the moisture value.
- Grain Type. The abbreviated name of the grain type (see accompanying table).
- Crop Year. The crop year in which the sample was received.

3. Instructions for submitting.

Submit as flat ASCII files (see note below) on 3.5" diskettes, one diskette for each instrument, with each grain in a separate file. Name the files using the abbreviations in the accompanying table and report each observation as a single record on a single line. Package the disks in protective mailers and mail to the NTEP Laboratory.

Note: The print files generated by today's popular spreadsheets are flat ASCII text files; that is, the contents are in one continuous string with each field delimited by one space (or a comma) with each record delimited by a carriage return line and a line feed.

File Names for Submitting NTEP Meter Data for Calibration Review

Grain Type	File Name
Durum	DU
Hard Red Spring Wheat	HRS
Hard White Wheat	HDWH
Soft White Wheat	SWH
Hard Red Winter Wheat	HRW
Soft Red Winter Wheat	SRW
Six-Rowed Barley	SRB
Two-Rowed Barley	TRB
Corn	CORN
Oats	OATS
Long Grain Rough Rice	LGRR
Medium Grain Rough Rice	MGRR
Sorghum	SORG
Soybeans	SOY
Sunflower Seeds (Oil Type)	SFS

7. Proposed Change to Publication 14 - Tolerances for Calibration Performance

Background: The present organization, wording, and a typographical error of this part of the GMM Check List have made it difficult to understand and have led to misinterpretations of the Sector's original intent. Further, the paragraph referring to annual meetings of a committee to assist in making determinations regarding which calibrations need to be updated is no longer representative of the way changes are being administrated.

Decided: The Sector approved the changes shown below to address these problems:

IV. Tolerances For Calibration Performance:

Calibration performance must be tested against established criteria at the following stages of the type evaluation process:

1. Evaluation of the calibration data supplied by the manufacturer with the application for type evaluation.

2. Evaluating instrument and calibration performance over the 6 percent moisture range for corn, HRW wheat and soybeans (accuracy test discussed earlier).

3. Initial calibration approval for grains other than corn, HRW wheat, and soybeans.

4. Review of on-going calibration data collected as part of the national calibration program.

Calibrations for corn, HRW wheat and soybeans will be approved based upon type evaluation testing over a 6 percent moisture range and manufacturer supplied data over the remainder of the calibration range (See Part V. Criteria for NTEP Moisture Calibration Review.) The bias of all samples in a 2 percent moisture interval may not exceed one-half of the Handbook 44 acceptance tolerance.

Calibrations for other grains will be approved based upon data collected as part of the on-going national calibration program. Approval tolerances will again be one-half of the Handbook 44 acceptance tolerance, and will be applied in 2 percent intervals over the range of available data. An overall bias may be applied to the calibration in making approval decisions.

Tolerances used to require a change in ~~"approved"~~ calibrations will include the application of a 95 percent confidence interval to the maximum tolerance for each 2 percent moisture interval. The intent of applying the confidence interval is to avoid forcing a calibration change based upon insufficient data. After only 1 year of data collection, the number of samples in some intervals will be small and the confidence interval may be as large as the tolerance limit. In this instance, the calibration would have to be extremely poor before a calibration change would be mandated. After the instrument has been in the calibration program for several years, the confidence interval should be reduced to approximately 0.05 and recommendations can be made with greater certainty. The latest 3 years of data will be used to make decisions regarding the need to make a calibration update.

The status of all calibrations will be listed on the certificate of conformance. The categories are (1) approved, (2) pending, and (3) not available. The categories can be described as follows:

Approved: Corn, HRW wheat, and soybean calibrations will be approved based upon performance over the 6 percent type evaluation moisture range and manufacturer supplied data. Continued approval requires acceptable performance as part of the ongoing national calibration effort.

Calibration data, collected as part of the national calibration program, must indicate that calibration performance meets the tolerances for each 2 percent moisture interval before additional grains will be approved. Continued approval again requires acceptable performance as part of the national calibration effort, i.e., none of the average differences between predicted and reference values for the respective 2 percent moisture intervals exceed one-half the Handbook 44 acceptance tolerance plus a 95 percent confidence interval.

Pending: A new calibration will automatically be placed in this category.

This category also includes calibrations that have not yet met the criteria for approval, but that also have not performed badly enough to be listed as not approved. Such calibrations may be used on NTEP-approved meters.

Not Available: A calibration is not available for this grain included in the national calibration program. A calibration for this grain type shall not be used on NTEP approved meters.

For grains other than corn, soybeans and hard red winter wheat, a calibration ~~should~~ will not be listed on the Certificate of Conformance until it has had its calibration bias checked using a set of 10 to 12 samples referenced to the FGIS air oven laboratory and the FGIS official meter.

For this bias check the maximum allowable overall bias between Meter under test and air oven is: ± 0.4.

During bias testing of such pending ~~provisional~~ calibrations, if biases are detected which exceed the limits shown above ~~below~~, the Type Evaluation Laboratory shall immediately notify the Manufacturer. The Manufacturer shall then make changes or adjustments to the calibration which, in the Manufacturer's best judgement, minimize the differences between the Manufacturer's meter and the official air oven.

In support of such changes, the Manufacturer shall forward to the Type Evaluation Laboratory:

1. Detailed descriptions of the changes,
2. an explanation of how the changes affect the previous test results,
3. the calibration coefficients for the revised calibration, and
4. the unique identifier of the revised calibration.

The Type Evaluation Laboratory shall not forward a recommendation for certification to NIST until the Manufacturer supplies this information or notifies the Type Evaluation Laboratory that it wishes to amend the application for type approval to show the calibration in question as "NOT AVAILABLE." Testing of the revised calibration by the Type Evaluation Laboratory will not be required.

~~The Maximum allowable overall bias between Meter under test and air oven is: ± 0.4.~~

~~Not Available: A calibration is not available for this grain included in the national calibration program. A calibration for this grain type shall not be used on NTEP approved meters.~~

~~A committee, perhaps the Moisture Meter Sector, shall meet each year to help make determinations regarding which calibrations need to be updated. This committee will take into consideration unusual growing conditions when making decisions related to calibration adequacy.~~

8. Test Weight per Bushel Indications

Background: The Grain Moisture Meter Code in H44 contains the following field test requirement for Test Weight per Bushel Indications:

> **T.3. For Test Weight Per Bushel Indications or Recorded Representations.** The maintenance and acceptance tolerances on test weight per bushel indications or recorded representations shall be 0.193 kg/hL or 0.15 lb/bu. The test methods used shall be those specified by the USDA FGIS. (Amended 1992)

Some time ago, when the Sector was discussing this requirement, the reasonableness of the tolerance, was questioned, especially as it applied to the test weight of corn. It was pointed out that the tolerance was taken from FGIS (now GIPSA) procedures which used only dockage-free dry hard red winter wheat. The Sector was in general agreement that the test was not realistic for assessing the performance of the various types of devices in commercial use, and that a different tolerance should be considered for each grain type. The Sector considered dropping this section from the Moisture Meter Code, reasoning that it would be more appropriate to include it in a separate chapter of H44 devoted specifically to the requirements for test weight per bushel devices. Several members of the Weights and Measures Community objected, however, stating that deletion of this section, prior to the development of a separate code chapter, would leave them without inspection and enforcement authority over these devices.

There are now at least two NTEP Grain Moisture Meters which have the capability to automatically provide an indication and recorded representation of test weight per bushel. Because of the unrealistic tolerances in the existing Code, however, the test weight capability of these meters was disabled for the NTEP tests. Some State W&M Officials are permitting these devices to

display and print the test weight information provided that some disclaimer appears on the printed ticket (e.g. the words "approximate" next to the test weight result) or that a warning against use of the information for commercial purposes is posted prominently on the device.

As early as 1986, the International Organization for Standardization (ISO) had adopted a "reference method," utilizing a complicated apparatus with a 20 liter container, for determining grain bulk density (mass per hectoliter). This reference method is detailed in International Standard ISO 7971. Recently, ISO approved a "routine method" (ISO 7971-2), using a one-liter device (sometimes referred to as a chondrometer). In this method, a pre-measured volume of grain is dropped, under controlled conditions, into a tall cylinder. A blade, manually pushed through a slot in the cylinder, separates one liter of grain from the excess. The one liter portion is then weighed and a kilogram per hectoliter figure is calculated (applying a slope and bias correction for differences between the one-liter device and the reference method). The method specified in ISO 7971-2 has become the recognized international standard for test weight. Because the straight conversion factor of 1.287 used in the United States to change pounds per bushel (measured with the quart test kettle) to kilograms per hectoliter considers only the relationship between volume and weight between English and metric systems, and does not take into account packing differences caused by the two different methods, measurements made using the two methods do not agree. GIPSA has been gathering data comparing test weight measurements obtained with GIPSA's 1-quart test kettle method and the internationally used 1-liter chondrometer to determine what should be done to eliminate problems caused by differences between the two procedures.

To provide the Sector with additional background on this subject, Larry Engebretson, GIPSA Technical Center, briefed the Sector on the differences between the official U.S. procedure for determining test weight for wheat and the method specified in ISO 7971-2 . The official U.S. procedure is described in GIPSA's *Grain Inspection Handbook*, Book II, Chapter 1. Apparatus specifications are contained in GIPSA's *Equipment Handbook*, Chapter 5. At present, there is no standard reference method for the U.S. procedure. New kettles (or kettles producing questionable results) are water volume tested (weight of water in kettle must be 1,098.08 grams ± 1gram). Complete apparatus is check tested by comparing it with a like "master unit" using samples of hard red winter wheat. Check tests are performed initially and periodically. The apparatus under test must agree with the "master" unit within ±0.15 lbs/bu (based on five replicates per sample with the highest and lowest result discarded before calculating an average). Tests using three replicates of some 600 wheat samples show a variability of 0.074 lb/bu for the U.S. method. This compares with an average standard deviation equivalent to 0.089 lb/bu for the ISO routine method. Reproducibility figures were not available for the ISO method. The major source of variability for the U.S. method is an abnormal stroker while the major source of variability for the ISO method is inappropriate pouring rate. Converting lb/bu tests made using the U.S. method to the equivalent Kg/hl result with the ISO method involves adding a bias (ranging from 1.8 kg/hl for durum to 2.6 kg/hl for hard red wheat) to the value obtained by straight units conversion (multiply lb/bu by 1.287).

To acquaint the Sector with various devices being used commercially for test weight measurement, Tom Runyon, Seedburo Equipment Company, demonstrated some of the equipment currently available.

Discussion: This issue was reviewed at the Sector's March 1996 meeting. The Sector was in general agreement that Test Weight per Bushel devices (Grain Bulk Density Apparatus) should be addressed in Code separate from the Grain Moisture Meter Code. At that meeting all Sector members present expressed an interest in working on this new code, noting that the measurement of Test Weight was next in priority behind moisture and protein measurement when the Grain Quality Incentives Act of 1990 authorized GIPSA to work with NIST and NCWM to standardize commercial inspections. Time limitations prevented the Sector from addressing the following questions at the September 1996 meeting. They will be considered at the March 1997 meeting.

1. What is the appropriate Reference Method or National Standard?
2. The characteristics of known test weight measuring devices are tabulated below. Is the Sector aware of any additional types? Should the proposed Code cover all types and variations shown?

   a. **Test Kettle** with manual strike-off

Kettle Size:	pint
	quart
	l iter
	half-liter
Scale Type:	Beam balance (calibrated in mass units, chart or calculation required)
	Electronic scale (calibrated in mass units, chart or calculation required)
	Electronic scale (calibrated directly in test weight)

b. **Chondrometer**

Volume:	one-fourth liter
	half liter
	liter
Scale Type:	Beam balance (calibrated in mass units, chart or calculation required)
	Electronic scale (calibrated in mass units, chart or calculation required)
	Electronic scale (calibrated directly in test weight for selected grain type)

c. **Other** (incorporated into grain moisture meters or other grain measuring devices or constructed specifically as a test weight device not classified above)

Volume:	Various (device dependent)
Operation:	Fully automatic (with internal weighing device and direct display of test weight for selected grain type)
	Manual filling and manual volume isolation (with internal weighing device calibrated directly in test weight for selected grain type)

3. Is the chondrometer practical for use with large kernels and seeds such as corn, soybeans, and sunflower seed?

4. Should further action on this item be postponed until GIPSA has decided whether to adopt ISO 7971 as a reference method?

9. Progress Report on Compilation of Baseline Performance Data

The objective of the NTEP Moisture Meter Program is to bring interstate and intermeter comparisons closer together. To determine if this objective is being met, data has been compiled from State Weights and Measures existing field test reports to establish a "pre-NTEP" performance baseline which can be compared to data compiled from field tests made after the NTEP program has been in effect for several years. Dr. Thomas Brumm, Composition Systems division of MBS Incorporated, reported on results compiled by Joy M. Irlbeck and Dr. Charles R. Hurburgh, both of Iowa State University, (See Attachment). It was noted that three of the major grain states (Illinois, Iowa, and Indiana) did not supply the requested field test data. It was also noted that Arkansas had submitted data but was not mentioned in the report. From the data supplied, the report concluded that states are doing a good job of maximizing the performance of existing meters. Estimates of current performance, measured by standard deviation relative to the oven are:

Corn:	±0.45% pts
Soybeans:	±0.30% pts
Soft Wheat:	±0.35% pts

The report recommends: (1) that the earlier oven-meter collaborative study be repeated; (2) that attempts be made to obtain data from additional states; and (3) that Handbook 44 be revised to allow for method-specific tolerance. [*Editor's note:* Handbook 55 already contains the note: "These tolerances do not apply to tests in which grain moisture meters are the transfer standard."] The Sector endorsed the recommendation to repeat the earlier collaborative study. Dr. Hurburgh had sent word that ISU would distribute the samples if the earlier participants would agree to repeat the study. He indicated that participant oven data would be optional as the earlier study had shown good stability of samples for the moisture ranges involved. Some Sector members were of the opinion that some of the earlier results, represented as being obtained on NTEP meters, did not, in fact, use the final NTEP approved calibration or were obtained on older models which did not have characteristics identical the NTEP versions. The Sector urged the organizer to insist that each collaborator provide, along with their meter results, a copy of the calibrations actually used.

10. Proposed Change to Publication 14 - Sample Temperature Sensitivity

[Note: Because of time limitations, action on this item was postponed until the next Sector meeting. The following *Background* and *Proposal* are repeated in full in this Meeting Summary to remind Sector Members that this issue will be on the agenda for the Sector's March 1977 meeting and to allow manufacturers time to assess the impact of this proposal.]

Background: In some instruments, temperature compensation is accomplished by including, in the calibration set, data obtained on samples at various temperatures. For these instruments, calibration updates may affect the temperature compensation and thus affect performance over temperature. At an earlier meeting, the Sector was reminded that temperature studies were not included in Phase II of the NTEP moisture program and that no temperature testing had been performed by the NTEP Laboratory on the "other 13" NTEP grains [i.e., grains other than corn, soybeans, and hard red winter wheat]. One manufacturer expressed the opinion that manufacturers should be required to submit temperature data for the "other 13" grains and also for any grain when

a calibration change is made. Another suggested that calibration changes for a given meter model could be evaluated based on spectral or "raw" data if it is available for the moisture and temperature ranges involved. It was also suggested that moisture data be collected on one or two samples at both extremes of temperature in each 2 percent interval of moisture over the desired moisture range. Though discussed at length, the Sector failed to reach a consensus on detailed rules and procedures for obtaining objective evidence that temperature performance was acceptable for calibrations for the "other 13" grains and for any calibration changes made on any grain subsequent to NTEP testing. The Sector Technical Advisor and the NTEP laboratory representative were asked to propose minimum data requirements and a detailed procedure for collecting temperature data on: 1) the "other 13" grains and 2) the "standard 3" grains for extended moisture ranges.

Proposed: The Sector is asked to approve changes to the first paragraph of the Sample Temperature Sensitivity Test of Publication 14 for Grain Moisture Meters to correct typographical errors and to set the upper test temperature limit to 45 °C to agree with the upper limit of 45 °C in the test on Instrument Temperature Sensitivity. [*Note:* For additional discussion on this upper temperature limit, see the September 1995 Meeting Summary.] The Sector is also asked to approve the addition of a note to the end of the Sample Temperature Sensitivity test to address the requirement for manufacturers to provide objective evidence of satisfactory performance for grain calibrations not tested by the NTEP laboratory over the range of specified sample temperatures, and to approve the addition of Appendix D which specifies the procedure for conducting the test and defines the requirements for manufacturer provided data.

II. Sample Temperature Sensitivity:

Additional testing is required to verify that accurate results are provided when the sample and instrument are at different temperatures. This will be referred to as the sample temperature sensitivity test. The purpose of this test is to verify that the instrument provides accurate results when the difference in temperature between the sample and the instrument is at the manufacturer specified, difference (a minimum Δ of 10 °C is required). The sample temperature sensitivity test will be conducted using corn, HRW wheat, and soybean samples. Tests will be conducted with the instrument at room temperature and the sample temperature varying from room temperature ~~+ΔT to room temperature~~ $+\Delta T_H$ to room temperature $-\Delta T_C$. ~~ΔT~~$_C$ (where ΔT_H is the manufacturer specified difference for grain above room temperature, and ~~the~~ ΔT_C is the manufacturer specified difference for grain below room temperature. In no case will room temperature $\pm\Delta T_H$ be allowed to exceed ~~32~~ 45 °C, but the two differences need not be equal.)

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Note: For any NTEP approved or pending calibration not previously tested by the NTEP Laboratory for Sample Temperature Sensitivity, manufacturers are required to provide objective evidence that those calibrations will perform satisfactorily over the range of temperatures specified by the manufacturer. This includes calibrations for any of the "other 13" NTEP grains [i.e., grains other than corn, soybeans, and hard red winter wheat] as well as any calibrations (including corn, soybeans and hard red winter wheat) which have been changed or modified subsequent to either NTEP testing or submission of manufacturer's data. Performance limits, test methods, and data to be submitted are specified in Appendix D.

Appendix D - Sample Temperature Sensitivity
Manufacturer Provided Data

The sample temperature sensitivity test is required to verify that accurate results will be provided when the sample and instrument are at different temperatures. This Appendix specifies the procedure for conducting the test and defines the requirements for manufacturer provided data. Tests will be conducted with the instrument at room temperature and sample temperature varying from room temperature ΔT_H to room temperature $-\Delta T_C$. (where ΔT_H is the manufacturer specified difference for grain above room temperature, and ΔT_C is the manufacturer specified difference for grain below room temperature.)

Two (2) samples are to be selected from each of three 2 percent moisture intervals for each grain type for which data is to be provided. Two analyses will be made for each grain sample at each of the three test temperatures. The overall bias for the 12 observations (2 samples x 3 moisture intervals x 2 replicates) run at the temperature extremes must agree with the room temperature results within the tolerances listed in the accompanying table.

Test Procedure:

1. Analyze the room temperature samples on the test instrument (Room 1).

2. Condition samples to the cold temperature and run on the instrument under test (Cold).

Note: Each sample is to be checked for temperature before it is analyzed. Samples must be within 0.5 °C of the desired test temperature at time of analysis, and samples are to be reconditioned to the test temperature after each analysis. The sample cell on the instrument under test is to be given a minimum of 10 minutes to equilibrate to room conditions between sample analyses.

3. Bring the samples to room temperature, and run the samples on the instrument under test (Room 2).

4. Condition the samples to the hot temperature and run on the instrument under test (Hot), observing the precautions in the note following step 2.

5. Repeat step 3 to obtain another set of room temperature results (Room 3).

COLD BIAS = Cold- ((Room 1 + Room 2) / 2)
HOT BIAS = Hot- ((Room 2 + Room 3) / 2)

Note: As an alternative to repeating actual temperature tests for calibration changes made after manufacturer data has been provided, subsequent results may be predicted using the new calibration and previously collected spectral or other "raw" data.

Manufacturer (or Applicant) Data to be supplied:

1. Name of applying organization.
2. Manufacturer (if different from Applicant.)
3. Model and serial number
4. Source of moisture results (actual test or predictions using existing spectral or other "raw" data) and date(s) original spectral or "raw" data was obtained.
5. For each grain type, specify type and show moisture results vs air-oven values on each individual sample at each temperature.
6. Calculate and show averages for Hot moistures, Cold moistures, Room 1 moistures, Room 2 moistures and Room 3 moistures.
7. For each grain type calculate and show cold and hot bias.

Moisture Ranges and Tolerances for Sample Temperature Sensitivity
Manufacturer Supplied Data

Grain Type	Moisture Range for Test	Tolerance Limit (Bias at Temperature Extremes)
Corn	12-18%	0.35
Durum Wheat	10-16%	0.35
Eastern White Wheat	10-16%	0.35
Western White Wheat	10-16%	0.35
Hard Red Spring Wheat	10-16%	0.35
Hard Red Winter Wheat	10-16%	0.35
Soft Red Winter Wheat	10-16%	0.35
Hard White Wheat	10-16%	0.35

Sunflower seed (Oil)	6-12%	0.45
Grain Sorghum	10-16%	0.45
Soybeans	10-16%	0.35
Two-rowed Barley	10-16%	0.35
Six-rowed Barley	10-16%	0.35
Oats	10-16%	0.45
Long Grain Rough Rice	10-16%	0.45
Medium Grain Rough Rice	10-16%	0.45

11. Proposed Revision to H44 Sec. 5.56(a) -S.2.4.3. Calibration Transfer

[This item was not included in the Agenda distributed in August. It was added to the agenda at the meeting by consensus of the Sector.]

Background: The requirements for calibration transfer between moisture meters of like model are specified in the Grain Moisture Code of Handbook 44:

> **Calibration Transfer.** - The instrument hardware/software design and calibration procedures shall permit calibration development and the mathematical transfer of calibrations between instruments of like models.
>
> **Note:** Only the manufacturer or the manufacturer's designated service agency may make calibration transfer adjustments on moisture meters and, except for instrument failure and repair, only at a prescribed period of time during the year. This does not preclude the possibility of the operator installing the manufacturer-specified calibration constants or standardization parameters under the instructions of the manufacturer or his designated service agency.

Early in the development of the NTEP program for moisture meters, the suitability of NIR instruments for use in a regulated commercial environment was questioned. When it became clear that the industry was strongly in favor of permitting NIR instruments to be used for commercial moisture measurements, the Sector agreed that any modifications to the Moisture Meter Code to permit the use of NIR instruments should not compromise the enforcement controls then in effect for meters using other technologies. Thus, the requirement for calibration transfer was adopted. The intent was to require identical calibrations in meters of like type so field inspectors could verify that correct calibrations had been installed in the instrument. Calibration adjustments (for moisture) were not expected to require change for at least a 12-month period (except in cases of device repair).

The Code provision allowing the operator to install manufacturer-specified calibration constants or standardization parameters (under the instructions of the manufacturer or his designated service agency) originally had two objectives:

1. To allow the user to install a new calibration without having to return the instrument to the manufacturer or a service agency.

and 2. To allow the user to install new standardization parameters (calibration transfer adjustments) if required by the field replacement of certain components (provided that the manufacturer has the means to determine the appropriate standardization parameters without having the instrument in the shop).

Most NIR instruments are "multi-constituent" devices capable of measuring moisture, protein, etc. For commercial use, they must meet the requirements of both the Grain Moisture Meter Code and the Near-Infrared Grain Analyzer Code (NIR Code). Early in the development of the NIR Grain Analyzer Code, the NIR Sector recognized that provisions would have to be made for frequent ***user*** adjustments of bias in NIR protein calibrations (user determined slope adjustments are not permitted). To provide the necessary security, the NIR Code stipulates that user bias adjustments can be made only on the basis of tests run on a current set of Standard Reference Samples (SRS) traceable to FGIS Master Instruments, and the user is required to keep a log (Calibration Adjustment Data Sheet) which field inspectors can check against the device's event logger, also required by the NIR Code. The GMM Code presently has the same Calibration Transfer wording as the NIR Code. The GMM Code contains no user requirement regarding bias adjustments because most GMM Sector members had believed that user determined bias adjustments would not be required. [Earlier GMM Code had not permitted such adjustments.]

Because later versions of the GMM Code did not specifically require the same bias values for a given grain moisture calibration in all instruments of like type, some manufacturers of multi-constituent devices have used bias terms to standardize readings between individual instruments of like type. In these instances, for a given grain, the same calibration constants and the same slope value are used in all instruments, but bias values differ from instrument to instrument. When these instruments were submitted for type evaluation, the NTEP laboratory did not consider bias terms part of the calibration constants. As a result, bias terms do not appear on the CC's for these instruments. Without suitable standards, or a known "good" device to compare against, field inspection has no way of knowing if the bias value installed in an instrument is the correct one. Because moisture bias is a user accessible parameter in currently approved multi-constituent devices, the possibility for fraud exists (even within maintenance tolerance limits).

Proposed: The Sector was asked to consider modifying the Calibration Transfer paragraph (and the Note following) to further restrict the kind of changes which a user may make to grain moisture meters and to clarify the difference between standardization adjustments (or parameters) and grain calibration coefficients. The proposed changes are shown below.

> **S.2.4.3. Calibration Transfer. -** The instrument hardware/software design and calibration procedures shall permit calibration development and the ~~mathematical~~ transfer of calibrations between instruments of like models without requiring user slope or bias adjustments..
>
> **Note:** Only the manufacturer or the manufacturer's designated service agency may make ~~calibration transfer~~ standardization adjustments on moisture meters. ~~and, except for instrument failure and repair, only at a prescribed period of time during the year~~. This does not preclude the possibility of the operator installing ~~the~~ manufacturer-specified calibration constants ~~or standardization parameters~~ under the instructions of the manufacturer or his designated service agency. Standardization adjustments (not to be confused with grain calibrations) are those physical adjustments or software parameters which make meters of like type respond identically to the grain(s) being measured.

Discussion: The Sector was divided on this issue. NIR multi-constituent device manufacturers objected to the proposed change and were of the opinion that the event logger in the audit trail provided the necessary security. Manufacturers of dielectric moisture meters (in which bias terms are either coded into one of the calibration coefficients or listed explicitly as bias values on CC's) favored the change, supporting those Weights and Measures members who didn't want to see users making adjustments in an un-controlled manner. Some members were concerned that allowing bias adjustments in this manner would ultimately defeat the Sector's goal of uniformity between instruments. One Sector member wondered how field inspection would know the difference between an old NTEP calibration and a new NTEP calibration if the only change required was a bias change which was different in each instrument of that type. Another suggested that a table of manufacturer approved moisture biases be posted on the individual instruments. It was pointed out that this table would have to be revised whenever a calibration change was made. Multi-constituent device manufacturers were asked if it was possible to restrict user bias adjustment on moisture calibrations and still allow user bias adjustment on protein. Manufacturers indicated that this would require a software (or firmware) change.

Decided: The Sector was unable to reach a consensus on this issue. Further discussion was postponed to the Sector's March 1997 meeting. To assist the Sector in assessing how adequate an event logger is for providing security in this case, manufacturers were asked to provide copies of sample audit trails illustrating both calibration changes (installation of a new calibration) and several user bias adjustments to an existing calibration for their instruments. [Editor's note: If reproducible copies of the audit trails can be forwarded to Diane Lee at NIST/OWM by February 3, these will be duplicated and distributed with the agenda for the March meeting.]

12. Standardization of Instruments

[This item was not included in the Agenda distributed in August. It was added to the agenda at the meeting by consensus of the Sector.]

Background: Preliminary data compiled by Dr. Hurburgh suggested that instruments in the field (or in State Moisture Labs) are not closely aligned with instruments of like type in the NTEP lab. Thus, Phase II data collected on the NTEP lab instruments may not be truly representative of what can be expected in the field. Manufacturers typically maintain a "standard" instrument (or instruments) against which production units are tested and adjusted to be within the manufacturer's acceptable tolerance limits. At the present time, there are no requirements for the NTEP lab instruments to be periodically compared with manufacturer's standard(s) or adjusted to agree with the manufacturer's "standard(s)." Thus, any change in performance over time in either the NTEP lab units or the manufacturer's "standard" units can result in a corresponding loss of accuracy (compared to air oven) in production units. Procedures are needed to assure that manufacturer's standards and NTEP lab instruments are closely aligned. The Sector was asked to consider the following alternatives for establishing traceability between manufacturer's standards and the NTEP lab instruments:

1. Require NTEP lab instruments to be returned to the manufacturer annually for comparison with the manufacturer's standards. NTEP lab instruments to be re-standardized if comparisons are not within established limits (to be determined). Manufacturer to supply NTEP lab with a certificate of traceability (showing known errors) for each grain type.

2. At a designated time of year, require manufacturer to send a selected group of grain samples to NTEP lab after first running the samples on manufacturer's "standard" unit(s). NTEP lab then runs submitted samples on manufacturer's NTEP lab unit and returns samples and "raw" data to manufacturer. Manufacturer re-runs samples (to verify that samples have not changed), and uses "raw" data to determine if NTEP lab instruments need adjustment of standardization parameters. Adjustments are transmitted either by modem or disk and the sample exchange is repeated. When a sample exchange indicates that comparisons are within established limits, manufacturer supplies NTEP lab with a certificate of traceability (showing known errors) for each grain type.

3. Like "2" above, except manufacturer brings standard instrument (or pretested samples) to NTEP lab, runs the samples and makes needed adjustments on site. Manufacturer subsequently supplies NTEP lab with a certificate of traceability (showing known errors) for each grain type.

Discussion: Except for one manufacturer, who was concerned about possible shipping damage, alternative 1 was thought to be the most practical approach. Alternative 2 was eliminated from consideration, because differences in environmental conditions (temperature and humidity) between the two locations would add an additional source of possible variance which would not be desirable when attempting to achieve error limits of 0.1 percent or less. Alternative 3 was discarded because manufacturers were reluctant to have their "master" units leave their lab or factory. The Sector agreed that the specific alignment details (e.g., what instrument parameters to measure, what adjustments to make, etc.) would vary with the technology involved and the manner in which that technology had been implemented. The Sector was in agreement that the NTEP units should be standardized against manufacturers' master units annually (typically between March 1 and April 30). It was suggested that manufacturers should also be required to demonstrate that their methods for standardizing units in production provide reasonable assurance that units "as shipped" will agree with the NTEP units within acceptable tolerances. The Technical Advisor and the NTEP Lab representative were requested to suggest wording and error limits for these requirements which could be considered by the Sector at its next meeting for addition to the GMM Checklist in Publication 14.

Attendance List - Sector Meetings September 9-11, 1996, Kansas City, MO

NAME	AFFILIATION	SEPTEMBER		
		9	10	11
Jack Barber	JB Associates	x	x	x
Sean Bauer	Steinlite Corporation		x	
Connie Brown	DICKEY-john Corp.	x	x	x
Randy Burns	Arkansas Bureau of Standards	x	x	x
Tom Brumm	MBS, Incorporated (Alt. for C. Hurburgh, ISU)	x	x	
Marty Clements	Steinlite Corporation		x	
Bob Davis	Illinois Department of Agriculture		x	
Cassie Eigenmann	DICKEY-john Corp.	x	x	x
Larry Engebretson	USDA-GIPSA-TSD		½	
David Funk	USDA-GIPSA-TSD	x	x	
David Krejci	GEAPS	x	x	
Diane Lee	NIST/Office of Weights and Measures	x	x	x
Keith Locklin	ConAgra Corn Processing (representing GEAPS)	x	x	x
Don Muller	Bran+Luebbe	x	x	
Pontus Norbreus	Perstorp Analytical		x	x
Ray Oberg	Zeltex, Inc	x	x	
Tom O'Connor	National Grain & Feed Association	x	x	
Don Onwiler	Nebraska Public Service Commission	x	x	x
Allison Pflug	CSC Scientific	x	x	
Richard Pierce	USDA-GIPSA-TSD	x	x	x
James Rampton	USDA-GIPSA-TSD		x	
Ole Rasmussen	Foss Food Technology	x	x	x
Joe Rothleder	California Dept. of Food & Agriculture	x	x	x
Tom Runyon	Seedburo Equipment Co.	x	x	x
Fred Seeber	Shore Sales	x	x	x
Cheryl Tew	North Carolina Dept. Of Agriculture	x	x	x
Cliff Watson	Consultant	x	x	x
Diane Wise	Colorado Dept. of Agriculture, Meas. & Stds.	x	x	x
Robert Wittenberger	Missouri Dept. of Agriculture, Div. Weights & Meas.	x	x	x
Richard Wotthlie	State of Maryland	x	x	x

National Type Evaluation Technical Committee
Grain Moisture Meter Sector
March 10-12, 1997, Atlanta, GA

Meeting Summary

Agenda Items

*1. Report on NCWM Interim Meeting
*2. Changes in Sector Membership
*3. Time and place for next meeting
4. Update on Type Evaluation and Phase II Testing
5. Review of NTEP Processes: Phase I and II Application Process and Fees
6. Collaborative Study: Progress Report and Funding Issues
7. Proposed Change to H44 Sec. 5.56(a) - S.2.5. Provisions for Sealing
8. Proposed Change to Publication 14 - Sample Temperature Sensitivity
9. Proposed Revision to H44 Sec. 5.56(a) -S.2.4.3. Calibration Transfer
10. Proposed Addition to Publication 14 - V. Standardization of Instruments
11. Test Weight per Bushel Indications

NOTE: *The following three items did not appear on the Sector agenda as originally published. The Sector agreed, however, to consider them as discussion items at the present meeting.*

12. Phase II Funding
13. Mission of the Sector
14. GIPSA Response to NTEP Needs

Note: Because of common interest, items marked with an asterisk (*) were considered in joint session of the NIR Grain Analyzer and the Grain Moisture Meter Sectors.

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1. Report on NCWM Interim Meeting

The National Conference on Weights and Measures (NCWM) Interim Meeting was held January 12-16, 1997, in Rockville, MD. Diane Lee, NIST/OWM, reported on actions taken by the Specifications and Tolerances (S&T)Committee on issues of interest to the Sector. [Note: Item numbers and headings shown below correspond to the item numbers and headings of the Interim Meeting Agenda, NCWM Publication 15 dated December 1996. Additional discussion of these issues can be found in that publication.]

356-1 S.2.5. Provision for Sealing

At its September 1996 meeting the Sector recommended modifications to S.2.5. to categorize devices and methods of sealing in a manner similar to the categorization of devices in the Scales and Liquid Measuring Devices Code. Further modifications were approved by letter ballot January 2, 1997. A ballot comment from one Sector member suggested that the Category 1 sealing method should also be accompanied by the sentence: "If equipped with event counters, the device must be capable of displaying or printing through another on-site device, the contents of the counters." The S&T Committee agreed to forward the item to the Conference as a voting item but asked the Sector to consider if the added sentence should be included in the recommendation. [See GMM Sector Agenda Item 7 for additional discussion and the Sector's final recommendations.]

Ms. Lee also related that the Scale Manufacturer's Association (SMA) had presented a report, at the Executive Committee Meeting, on the status of States which have adopted or are considering adoption of uniform regulations regarding the use of NTEP devices. Of the Continental U.S. States, only 11 have not adopted regulations regarding the use of NTEP devices. In eight of the 11, NTEP regulations are under consideration. She noted that the SMA's primary focus is on the States which have adopted NTEP for weighing devices, so the SMA figures do not necessarily indicate the number of States which will apply NTEP regulations to NIR Grain Analyzers (when the tentative code becomes permanent) or the number of States which now apply NTEP regulations to Grain Moisture Meters.

2. Changes in Sector Membership

During the GMM/NIR Sector Meeting in Kansas City, MO September 9-11, 1996, a membership status report was distributed. It was noted that many individuals who have actively participated in Sector activities had not been formally appointed to the Sectors by the the NCWM Chairman. (NTEP policy requires that all persons seeking appointment to the NTETC GMM/NIR Sectors send individual letters on company letterhead to the NCWM Chairman requesting membership on the Sectors.) In early January 1997, Diane Lee, NIST/OWM, sent out a letter urging anyone interested in becoming a voting member of the Sectors to submit the required letter.

As of the date of this meeting, Barbara Bloch, the current NCWM Chairman, had received letters from the following individuals. At the recommendation of the Sector Chairman and the Sector Technical Advisor, these individuals have been appointed as Sector members:

Cassie Eigenmann	DICKEY-john Corp.
Keith Lochlin	Conagra Corn Processing (representing GEAPS)
John Miller*	CSC Scientific (replacing Allison Pflug)
Ray Oberg	Zeltex Inc.
Hiro Yamahira	Kett Electric Laboratory (replacing M. Emori)

* Subsequent to his appointment, John Miller left CSC. CSC will request the appointment of Tim Conwell to replace John Miller.

In response to a question about inactive members, Ms. Lee indicated that a letter would be sent to members who have not attended Sector meetings in recent years to determine if they plan to continue their participation in the Sector as voting members. This will be done in sufficient time to allow the membership list to be updated prior to the Conference's Annual Meeting in July.

3. Date and Site for Next Meeting

A two-day or two and one-half day meeting (one and one-half or two days for the Grain Moisture Meter Sector and one-half day for the NIR Protein Sector) is planned for September 10-12, 1997, in the Chicago area.

4. Update on Type Evaluation and Phase II Testing

Rich Pierce of the Grain Inspection, Processors and Stockyards Administration (GIPSA, formerly FGIS), the NTEP Participating Laboratory for Grain Moisture Meters, reported on the progress of Type Evaluations and the collection and analysis of Phase II data on 1996 crop.

As of March 10, two applications for Type Evaluation were open. Testing had been completed on one device, and test results were being reviewed. Testing had not begun on the other device.

Certificate of Conformance (CC) numbers have been issued for six device types:

Device Manufacturer	Model(s)	Years in Phase II
DICKEY-john	GAC 2000NTEP and GAC 2100	2
Sinar	Model 6310 Grain Pro	2
Seedburo	GMA 128	2
Perstorp	Infratec Model 1227	2
Foss	Grainspec A	2
Motomco	919E	1

Certificates have been published for the DICKEY-john and Sinar devices. Final Drafts of CC's for the remaining devices were given to those manufacturers present at the Sector meeting (and mailed to those not present) for final review before publication.

Data for the 1996 crop year has been collected on all NTEP instruments enrolled in Phase II. The data and a summarizing report for all grains except corn and soybeans has been sent to manufacturers. Dr. Pierce noted that procedures were being changed so that data and summarizing reports for any grain or class of grain would be sent to all manufacturers simultaneously. Previously, the data and individual reports were sent out as each was completed, so that manufacturer "A" might receive hard red winter wheat data several weeks before data was sent to manufacturer "B."

Dr. Pierce anticipated that some calibration changes would be required, but at this point did not know how extensive the changes would be. He reminded device manufacturers that a change in calibration requires that moisture data for both 1996 and 1995 crop years be re-predicted using the new calibration. The re-predicted data must be returned to the Lab in standard data format. [See September 9-11, 1996 GMM Sector Meeting Summary for a definition of the standard data format.]

5. Review of NTEP Processes: Phase I and II Application Process and Fees

For the benefit of new members, Diane Lee, NIST, reviewed the process for submitting an application for device type evaluation. She also reviewed the procedures associated with maintaining a current Certificate of Conformance under Phase II of the moisture meter program. These are summarized below:

Phase I (New Device Testing)

1) Manufacturer submits application for Phase I Type Evaluation Testing of a "New" device. The deadline for applications is January 1 if the device is to be included in Phase II for the coming season.

   Note: Applicants for Phase I testing must apply for Phase II testing at the same time. The application fee for new devices is $175. The cost of Phase I testing will vary according to device type and the hourly fee charged by the testing laboratory. Typical Phase I costs have ranged from $6000 to $9000 per device type. Through the 1999 crop year, a fee of $3500 per device type will be levied each year for collection and analysis of Phase II data. The cost to the Manufacturer for Phase II testing after 1999 has not been determined.

2) NIST assigns a control number to the application.

   This allows NIST to track the application until a CC number is assigned.

3) NTEP Lab performs tests.

   A minimum of 2 months are required for testing. If problems are encountered, they must be resolved before Phase II testing begins for the season; otherwise, participation in Phase II (and issuance of a CC) will be delayed to the following season. Partial Season testing is NOT allowed.

4) If testing is successful, CC *number* is assigned by May 1.
5) Certificate is issued by May 31.

Phase II (applicant's second and following years in the program)

1) The deadline for a manufacturer to submit an application for *continuing participation* in Phase II is May 1. (e.g., May 1996)

   Note: To maintain an active or effective CC, manufacturers must participate in the on-going Phase II calibration maintenance program. The manufacturer must submit a new application for Phase II Testing *every year*. Through the 1999 crop year, a fee of $3500 per device type will be levied each year for collection and analysis of Phase II data. The cost to the Manufacturer for Phase II testing after 1999 has not been determined.

2) NIST assigns a control number to the application.
3) Approved application is sent to NTEP Lab.
4) Data collection for current crop year is initiated. (e.g., 1996)
5) NTEP Lab provides manufacturer the last of the summary reports and data by March 1. (e.g., March 1, 1997)
6) Manufacturer makes any required calibration changes and provides NTEP Lab with re-predicted data by April 15. (e.g., April 1997)
7) NTEP Lab reviews manufacturer's data, validates change, and forwards information for revising CC to NIST by May 1. (e.g., May 1997)
8) NIST issues updated CCs by June 1. (e.g., June 1997)

Diane pointed out that the NTEP Application Form for Grain Moisture Meters is available on NIST's 24-hour fax-line (1-800-925-2453, request Document #410).

In the ensuing discussion, several members asked what would happen to NTEP meters already in use if a manufacturer decided to no longer participate in Phase II testing. One Weights and Measures (W&M) representative indicated that once a device's CC has expired, that device can no longer be used commercially in his state. Grain representatives were quick to point out that this was of great concern to their industry. They did not want to risk purchasing a device which could no longer be used after a few years. It was stated that this was one reason the industry was eager for GIPSA to choose an official meter from the list of NTEP meters. By purchasing the same model as the official meter, they reasoned that they could be assured of continued support. It was suggested that one of the reasons that some states didn't want to adopt NTEP procedures for moisture meters was the because of the politics of the issue; State Department of Agriculture Officials (responsible for Weights and Measures issues) in major grain states didn't want to be placed in the position of having to tell grain elevator operators that they could no longer use a device which

had been purchased recently. There was concern that not all states will enforce the program uniformly. In some states, non-NTEP meters will be allowed to be sold. The same thing is likely to happen to NTEP devices of manufacturers who elect not to continue to participate. Manufacturers were in general agreement that the decision whether or not to continue to support a specific model would be an economic one. If sales to the grain industry are important to a company, a company would be foolish to withdraw support of a device, even if newer models are introduced. Some manufacturers have gone to great lengths to ensure that calibrations from newer instruments can be used on discontinued models. There is a marketing advantage to keeping a meter in a program whose purpose is minimizing differences between official and commercial moisture measurements. It was pointed out that non-NTEP meters manufactured or placed in service before January 1, 1998 may continue to be used until they no longer can be repaired to pass field tests. A similar status was suggested for NTEP meters no longer supported by manufacturers. Such meters could continue to be listed in Publication 5, but the status could be shown as "inactive" or "unsupported." The problem, as viewed by W&M member, was one of confidence. When a manufacturer withdraws a meter from the program, confidence is lost in the calibrations and the ability of that device to remain aligned with the official system. Field tests may detect bias differences, but they don't tell you anything about performance at temperature or moisture extremes. After lengthy discussion, the Sector agreed that a subcommittee should be formed to address the concerns of users, manufacturers, and regulators on this issue. The Subcommittee was charged with producing a report, addressing these issues, for presentation to the Sector at its September meeting. The subcommittee is composed of the following members:

Dr. Charles R. Hurburgh, Iowa State University - Organizer
G. Diane Lee, NIST
Tom O'connor, NGFA
Tom Runyon, Seedburo
Cheryl Tew, NC Dept. of Agriculture
Ray Oberg, Zeltex
Randy Burns, AR Dept. of Agriculture
Tim Conwell, CSC Scientific
Don Onwiler, NE Public Service Comm. [if he agrees to serve]
Jack Barber, JB Associates

6. Collaborative Study: Progress Report and Funding Issues

The objective of the NTEP Moisture Meter Program is to bring interstate and intermeter comparisons closer together. Progress toward these objectives has been measured by oven-meter and meter-meter collaborative studies. Results of an earlier study were questionable, seeming to indicate that agreement of devices of like type within those thought to be NTEP meters was not as good as expected. Some Sector members were of the opinion that the earlier results, represented as being obtained on NTEP meters, did not, in fact, use the final NTEP approved calibration or had been obtained on older models which did not have characteristics identical to the NTEP versions. The collaborative study was repeated early this year. Special care was taken to ensure that devices were using the most recent NTEP calibrations. Because the number of true "NTEP" devices in the field is somewhat limited. Some judgement was used on the part of the organizer in classifying instruments as "NTEP" or "non-NTEP." Devices of recent manufacture which were of like design to NTEP meters but not truly "NTEP", were classified as "NTEP" devices. Dr. Charles Hurburgh, Iowa State University (ISU), presented the results of the most recent study in which three corn samples (16 to 18.2% moisture) and three soybean samples (10.2% to 17.8% moisture) from 1996 crop were sent to collaborators. Oven moisture results were provided by 15 laboratories. Meter results were obtained on instruments representing 12 brands (six NTEP and six "other"). A total of 142 meters were tested, 91 NTEP and 51 other. Test results are summarized below:

Oven Results (15 labs)			
Grain Type	Sample	Average	Range
Corn	C1	17.82	17.5-18.0
	C2	18.22	18.1-18.4
	C3	15.98	15.8-16.2
Soybeans	S1	10.20	10.0-10.3
	S2	12.47	12.4-12.6
	S3	17.79	17.3-18.1

Summary for Data Received to 3/7/97			
Grain Type	Group	Range of Averages(1)	Avg. Std. Dev. (Between Like Units)
Corn	NTEP Meters(2)	16.9 - 17.3	0.19
	Other Meters	16.9 - 17.2	0.28
	GIPSA Oven	17.51	
	All Ovens	17.34	
Soybeans	NTEP Meters(2)	13.1 - 13.4	0.19
	Other Meters	13.1 - 13.7	0.20
	GIPSA Oven	13.51	
	All Ovens	13.49	

(1) Average of all readings on all samples for a brand.
(2) Meters using NTEP calibrations.

Although pleased that the data seemed to indicate improvement compared to the previous study, some Sector members were concerned that the data might again be taken out of context by the grain press and used to make widespread conclusions about the relative performance of NTEP meters. It was stressed that the objective of the study was to establish a performance baseline, and that the data collected is not sufficient to draw valid conclusions about manufacturers' products. One member suggested that the Sector (or NIST) should write its own news release describing the study, its objectives, and what the results indicated. That way, industry could be kept informed about what is going on without risking that the information would be used to draw negative conclusions on just a limited amount of information.

The latest collaborative study was partially funded by NIST (with the balance of costs to be absorbed by ISU). On the subject of possible funding sources for future collaborative studies, grain association representatives expressed the belief that their members would not approve an increase in dues for this purpose. Device manufacturers, were reluctant to commit to an additional fee, already faced with significant fees for annual testing. Dr. Hurburgh raised the possibility of a grant from one of USDA's Federal/State Marketing Improvement Programs. He will send information on these programs to Diane Lee. Also mentioned was the possibility of assessing a "registration fee" for Sector meetings. Further discussion on the subject was tabled until the next meeting when the feasibility of obtaining a grant will have been investigated.

7. Proposed Change to H44 Sec. 5.56(a) - S.2.5. Provisions for Sealing:
[Note: Paragraph S.2.3., Provisions for Sealing, of the old Code became Paragraph S.2.5. in Section 5.56(a) of the re-organized Code adopted at the NCWM 81st Annual Meeting.]
Background: At the 1995 Annual Meeting of the NCWM, H44 paragraph S.2.3., Provision for Sealing, (later Section S.2.5 of GMM Code 5.56(a)) was amended to specify the minimum information which must be contained in the audit trail. At that time, however, no provision was made for devices capable of remote configuration. At their March 1996 meeting, the Sector discussed an audit trail requirement for devices capable of remote configuration. The Sector heard comments from one device manufacturer stating that there was no difference, from an enforcement stance between devices which required a seal to be broken at the device to allow changes at the keypad and a device which required a seal to be broken at the device to enable a change to be made from a remote site (e.g., via modem or acoustic coupler.) One consideration noted was the significant cost difference between implementing a physical seal and incorporating sufficient memory to implement an audit trail. At that time the Sector was unable to reach consensus on audit trail requirements for devices with remote configuration capability regardless of the need to break a physical seal prior to remote configuration. Further consideration of the issue was postponed to the Sector's September 1996 meeting.

Discussion: At its September 1996 meeting, the Sector recommended categorizing devices and methods of sealing in a manner similar to the categorization of devices in the Scales and Liquid Measuring Devices Code. Following that meeting, it was discovered that Category 1 of the Scales Code allows either a physical seal ***or*** two event counters: one for calibration parameters

and one for configuration parameters. The sealing method originally proposed by the GMM Sector for Category 1 devices allowed ***only*** a physical seal. The Sector had also failed to recommend an effective date for their recommended changes. To remedy these oversights, a letter (fax) ballot was sent to Sector members on January 2, 1997 soliciting their vote on two proposals:

(1) Add "or two event counters: one for calibration parameters and one for configuration parameters" to the proposed Category 1 Method of Sealing for the GMM Code 5.56(a)

and (2) Select a non-retroactive date of January 1, 1999 for the proposed change

Both proposals were approved and were forwarded to the Specifications and Tolerances Committee (S&T) for consideration as a National Conference voting issue. A ballot comment from one Sector member suggested that the Category 1 sealing method should also be accompanied by the sentence: "If equipped with event counters, the device must be capable of displaying or printing through another on-site device, the contents of the counters." The member reasoned that this was an explicit requirement for Category 2 devices, and that it should apply equally to Category 1 devices. If it were to be omitted from the requirements for Category 1 devices, the obvious assumption would be that the requirement did not apply. The S&T requested clarification from the Sector as to whether or not the suggested wording was their intent , noting that other codes *require* display and allow printing in addition.

Decided: Noting that the code already required devices to have provisions for providing a print out of measurement results, the Sector had no objection to allowing counter information to be *either* printed *or* displayed, and recommended the addition of the above wording (and a specification of counter sizes for both Category 1 and Category 2 devices) to the changes previously submitted to the S&T Committee. All changes (including those recommended at the September 1996 meeting and by the January 2, 1997 letter ballot) are shown below. [Editor's note: For clarity, in table S.2.5. only the wording considered by the Sector at this meeting has been underlined to indicate added text. The entire table is an "addition" to S.2.5.]

S.2.5. Provision for Sealing

~~(a)~~ *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 ~~part b~~ Table S.2.5.), before any change that affects the metrological integrity of the device can be made to any mechanism.*

~~(b) If the operator is able to make changes that affect the metrological integrity of the device (e.g., slope, bias, etc.) in normal operation, the device shall use an audit trail. The minimum form of the audit trail shall be an event logger and 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 (for calibration changes consisting of multiple constants, the calibration version number is to be used rather than the calibration constants.)~~

~~The device is not required to display this information, but a printed copy of the information must be available through another on-site device. The event logger shall have a capacity to retain records equal to twenty-five (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.)~~

[Note: Zero-setting and test point adjustments are considered to affect metrological characteristics and must be sealed.]

Table S.2.5. Categories of Device and Methods of Sealing

Categories of Device	*Method of Sealing*
Category 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 another on-site device, the contents of the counters.*
Category 2: Remote configuration capability, but access is controlled by physical hardware *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 remote configuration.*	*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 another on-site device, the contents of the counters.*
Category 3: Remote configuration capability access may be unlimited or controlled through a software switch (e.g., password)	*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 twenty-five (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	*Same as Category 3*
Category 3b: No remote capability, but access to metrological parameters is controlled through a software switch (e.g., password)	*Same as Category 3*

8. Proposed Change to Publication 14 - Sample Temperature Sensitivity

Background: In some instruments, temperature compensation is accomplished by including, in the calibration set, data obtained on samples at various temperatures. For these instruments, calibration updates may affect the temperature compensation and thus affect performance over temperature. At an earlier meeting, the Sector was reminded that temperature studies were not included in Phase II of the NTEP moisture program and that no temperature testing had been performed by the NTEP Laboratory on the "other 13" NTEP grains [i.e., grains other than corn, soybeans, and hard red winter wheat]. One manufacturer expressed the opinion that manufacturers should be required to submit temperature data for the "other 13" grains and also for any grain whenever a calibration change is made. Another suggested that calibration changes for a given meter model could be evaluated based on spectral or "raw" data if it is available for the moisture and temperature ranges involved. It was proposed that moisture data be collected on one or two samples at both extremes of temperature in each 2 percent interval of moisture over the desired moisture range. Though discussed at length, the Sector failed to reach a consensus on detailed rules and procedures for obtaining objective evidence The the Sector Technical Advisor and the NTEP laboratory representative were charged with drafting a proposal for consideration at the March 1977 meeting. This proposal is shown below.

Proposed: The Sector is asked to approve changes to the first paragraph of the Sample Temperature Sensitivity Test of Publication 14 for Grain Moisture Meters to correct typographical errors and the addition of a note to the end of the Sample

Temperature Sensitivity test to address the requirement for manufacturers to provide objective evidence of satisfactory performance for grain calibrations not tested by the NTEP laboratory over the range of specified sample temperatures. The Sector is also asked to approve the addition of Appendix D which specifies the procedure for conducting the test and defines the requirements for manufacturer provided data.

II. Sample Temperature Sensitivity:

Additional testing is required to verify that accurate results are provided when the sample and instrument are at different temperatures. This will be referred to as the sample temperature sensitivity test. The purpose of this test is to verify that the instrument provides accurate results when the difference in temperature between the sample and the instrument is at the manufacturer specified, difference (a minimum Δ of 10 °C is required). The sample temperature sensitivity test will be conducted using corn, HRW wheat, and soybean samples. Tests will be conducted with the instrument at room temperature and the sample temperature varying from room temperature ~~+ΔT to room temperature~~ $+\Delta T_H$ to room temperature $-\Delta T_C$. ~~ΔT_C~~ (where ΔT_H is the manufacturer specified difference for grain above room temperature, and ~~the~~ ΔT_C is the manufacturer specified difference for grain below room temperature. In no case will ΔT_H be allowed to exceed 32 °C, but the two differences need not be equal.)

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Note: For any NTEP approved or pending calibration not previously tested by the NTEP Laboratory for Sample Temperature Sensitivity, manufacturers are required to provide objective evidence that those calibrations will perform satisfactorily over the range of temperatures specified by the manufacturer. This includes calibrations for any of the "other 13" NTEP grains [i.e., grains other than corn, soybeans, and hard red winter wheat] as well as any calibrations (including corn, soybeans and hard red winter wheat) which have been changed or modified subsequent to either NTEP testing or submission of manufacturer's data. Performance limits, test methods, and data to be submitted are specified in Appendix D.

Appendix D - Sample Temperature Sensitivity
Manufacturer Provided Data

The sample temperature sensitivity test is required to verify that accurate results will be provided when the sample and instrument are at different temperatures. This Appendix specifies the procedure for conducting the test and defines the requirements for manufacturer provided data. Tests will be conducted with the instrument at room temperature and sample temperature varying from room temperature $+\Delta T_H$ to room temperature $-\Delta T_C$. (where ΔT_H is the manufacturer specified difference for grain above room temperature, and ΔT_C is the manufacturer specified difference for grain below room temperature.)

Two (2) samples are to be selected from each of three 2 percent moisture intervals for each grain type for which data is to be provided. Two analyses will be made for each grain sample at each of the three test temperatures. The overall bias for the 12 observations (2 samples x 3 moisture intervals x 2 replicates) run at the temperature extremes must agree with the room temperature results within the tolerances listed in the accompanying table.

Test Procedure:

1. Analyze the room temperature samples on the test instrument (Room 1).

2. Condition samples to the cold temperature and run them on the instrument under test (Cold).

Note: Each sample is to be checked for temperature before it is analyzed. Samples must be within 0.5 °C of the desired test temperature at time of analysis, and samples are to be reconditioned to the test temperature after each analysis. The sample cell on the instrument under test is to be given a minimum of 10 minutes to equilibrate to room conditions between sample analyses.

3. Bring the samples to room temperature, and run the samples on the instrument under test (Room 2).

4. Condition the samples to the hot temperature and run them on the instrument under test (Hot), observing the precautions in the note following step 2.

5. Repeat step 3 to obtain another set of room temperature results (Room 3).

COLD BIAS = Cold- ((Room 1 + Room 2) / 2)
HOT BIAS = Hot- ((Room 2 + Room 3) / 2)

Note: As an alternative to repeating actual temperature tests for calibration changes made after manufacturer data has been provided, subsequent results may be predicted using the new calibration and previously collected spectral or other "raw" data.

Moisture Ranges and Tolerances for Sample Temperature Sensitivity
Manufacturer Supplied Data

Grain Type	Moisture Range for Test	Tolerance Limit (Bias at Temperature Extremes)
Corn	12-18%	0.45
Durum Wheat	10-16%	0.35
Eastern White Wheat	10-16%	0.35
Western White Wheat	10-16%	0.35
Hard Red Spring Wheat	10-16%	0.35
Hard Red Winter Wheat	10-16%	0.35
Soft Red Winter Wheat	10-16%	0.35
Hard White Wheat	10-16%	0.35
Sunflower seed (Oil)	6-12%	0.35
Grain Sorghum	10-16%	0.45
Soybeans	10-16%	0.35
Two-rowed Barley	10-16%	0.35
Six-rowed Barley	10-16%	0.35
Oats	10-16%	0.45
Long Grain Rough Rice	10-16%	0.45
Medium Grain Rough Rice	10-16%	0.45

Manufacturer (or Applicant) Data to be supplied:

1. Name of applying organization.
2. Manufacturer (if different from Applicant.)
3. Model and serial number
4. Source of moisture results (actual test or predictions using existing spectral or other "raw" data) and date(s) original spectral or "raw" data was obtained.
5. For each grain type, specify type and show moisture results vs air-oven values on each individual sample at room temperature.
6. Calculate and show averages for Hot moistures, Cold moistures, Room 1 moistures, Room 2 moistures and Room 3 moistures.
7. For each grain type calculate and show cold and hot bias.

Decided: By a vote of 11 to 4, the Sector rejected the proposed changes citing several reasons: 1) the data which manufacturers of dielectric type instruments used to determine coefficients for temperature correction and to validate performance over a range

of sample temperatures had been recorded on now-obsolete media (e.g., tape cassettes for HP 9815 Computers) and was no longer retrievable; 2) the cost of Temperature Sensitivity Testing (even in the proposed "abbreviated" form) 13 grains is prohibitive and might result in manufacturers deciding to drop those grains from their CC's; 3) it is very difficult to obtain samples for some of the less widely grown grains.

To provide a method for selectively verifying temperature performance on a grain by grain basis, and to supply potential purchasers and W&M officials with information regarding the integrity of calibrations for each of "the other 13 grains", the Sector unanimously agreed that **the CC shall indicate those grains for which temperature performance has not been verified by the NTEP process.**

The Sector was unable to reach a consensus on the motion: "A manufacturer may submit data for other grain types to demonstrate compliance with temperature sensitivity requirements; the NTEP lab may ask for additional tests." Several members thought that some minimal amount of testing should be performed by the NTEP lab on any grain, believing that without NTEP lab testing, the whole NTEP process would be compromised. The NTEP lab representative indicated that even with the "abbreviated" tests originally proposed, the lab would not be able to respond to requests for tests this Spring. The Sector Technical Advisor was directed to consult with the NTEP lab representative and propose a revised "minimal" test procedure taking into account the difficulty of obtaining a range of moistures for some samples. The revised procedure will be submitted to the Sector for a vote at the September meeting or for letter ballot if available earlier.

One member asked if the grain temperature differences (ΔT_H and ΔT_C, above and below room temperature) for the "other 13" grains had to be the same as the differences the manufacturer had specified for corn, soybeans, and hard red winter wheat. Although there didn't seem to be objections to allowing a different ΔT_H and ΔT_C to be specified for each grain, the Sector did not formally decide on this issue. CC's list a single ambient temperature operating range, a single grain temperature operating range, and a single ΔT_H and ΔT_C. The NTEP lab representative indicated that , until the Sector agreed otherwise, sample temperature sensitivity tests would be performed using the same temperature differences (ΔT_H and ΔT_C) which the manufacturer had previously specified.

9. Proposed Revision to H44 Sec. 5.56(a) -S.2.4.3. Calibration Transfer

Background: The requirements for calibration transfer between moisture meters of like model are specified in the Grain Moisture Code of Handbook 44:

> **Calibration Transfer.** - The instrument hardware/software design and calibration procedures shall permit calibration development and the mathematical transfer of calibrations between instruments of like models.
>
> **Note:** Only the manufacturer or the manufacturer's designated service agency may make calibration transfer adjustments on moisture meters and, except for instrument failure and repair, only at a prescribed period of time during the year. This does not preclude the possibility of the operator installing the manufacturer-specified calibration constants or standardization parameters under the instructions of the manufacturer or his designated service agency.

Early in the development of the NTEP program for moisture meters, the suitability of NIR instruments for use in a regulated commercial environment was questioned. When it became clear that the industry was strongly in favor of permitting NIR instruments to be used for commercial moisture measurements, the Sector agreed that any modifications to the Moisture Meter Code to permit the use of NIR instruments should not compromise the enforcement controls then in effect for meters using other technologies. Thus, the requirement for calibration transfer was adopted. The intent was to require identical calibrations in meters of like type so field inspectors could verify that correct calibrations had been installed in the instrument. Calibration adjustments (for moisture) were not expected to require change for at least a 12-month period (except in cases of device repair.)

The Code provision allowing the operator to install manufacturer-specified calibration constants or standardization parameters (under the instructions of the manufacturer or his designated service agency) originally had two objectives:

1. To allow the user to install a new calibration without having to return the instrument to the manufacturer or a service agency.

and

2. To allow the user to install new standardization parameters (calibration transfer adjustments) if required by the field replacement of certain components (provided that the manufacturer has the means to determine the appropriate standardization parameters without having the instrument in the shop.)

Most NIR instruments are "multi-constituent" devices capable of measuring moisture, protein, etc. For commercial use, they must meet the requirements of both the Grain Moisture Meter Code and the Near Infrared Grain Analyzer Code (NIR Code). Early in the development of the NIR Grain Analyzer Code, the NIR Sector recognized that provisions would have to be made for frequent ***user*** adjustments of bias in NIR ***protein*** calibrations (user determined slope adjustments are not permitted). To provide the necessary security, the NIR Code stipulates that user bias adjustments can be made only on the basis of tests run on a current set of Standard Reference Samples (SRS) traceable to GIPSA Master Instruments, and the user is required to keep a log (Calibration Adjustment Data Sheet) which field inspectors can check against the device's event logger, also required by the NIR Code. The GMM Code presently has the same Calibration Transfer wording as the NIR Code. The GMM Code, however, contains no user requirement regarding bias adjustments, because most GMM Sector members had believed that user determined bias adjustments would not be required for moisture calibrations. [Earlier GMM Code had not permitted such adjustments.]

Because later versions of the GMM Code did not specifically require the same bias values for a given grain moisture calibration in all instruments of like type, some manufacturers of multi-constituent devices have used a bias term for each grain calibration to standardize readings among individual instruments. In these instances, for a given grain, the same calibration constants and the same slope value are used in all instruments, but bias values differ from instrument to instrument. This has led to several problems:

1. Bias terms for these instruments do not appear on the CC's, so field enforcement personnel are unable to determine if the moisture bias term used in an individual grain calibration is correct.
2. Instrument standardization must be repeated each time a calibration is changed. Without traceable standards to determine new bias values, there can be no traceability of the device to the NTEP standard units unless this standardization is performed "side-by-side" with the manufacturer's master instruments.
3. When the only difference between calibrations for two successive years is a bias change (which is different in every device of like type), Weights and Measures (W&M) officials cannot differentiate between a legitimate bias change and one made arbitrarily by the user.

In either case, because moisture bias is a user accessible parameter in currently approved multi-constituent devices, the possibility for fraud exists (even within maintenance tolerance limits).

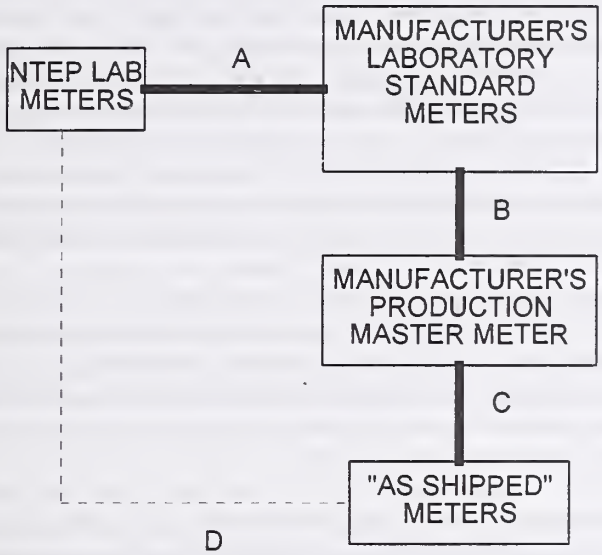
Discussion: At their September 1997 meeting, the Sector was divided on this issue. NIR multi-constituent device manufacturers objected to a proposal which would have prohibited user adjustments of bias on moisture calibrations, arguing that the audit trail event logger provided the necessary security. Manufacturers of dielectric moisture meters (in which bias terms have been identical for any given grain calibration in devices of like type) favored the proposed change, supporting those Weights and Measures members who didn't want to see users making adjustments in an un-controlled manner (even within maintenance tolerance limits). Some members were concerned that allowing bias adjustments in this manner would ultimately defeat the Sector's goal of uniformity between instruments. Multi-constituent device manufacturers were asked if it would be possible to restrict user bias adjustment on moisture calibrations and still allow user bias adjustment on protein. Manufacturers indicated that this was possible but would require a software (or firmware) change. Further discussion was postponed to the Sector's March 1997 meeting. To assist the Sector in assessing how adequate an event logger might be for providing security in this case, several manufacturers provided sample copies of audit trails illustrating both calibration changes (installation of a new calibration) and several user bias adjustments to an existing calibration for their instruments.)

Decided: The Sector agreed that, although informative, audit trails did not fully eliminate the problems cited in the above *Background.* The Sector adopted by consensus the following revisions to the H44 Calibration Transfer paragraph (and the Note following) to further restrict the kind of changes which a user may make to grain moisture meters, and to clarify the difference between standardization adjustments (or parameters) and grain calibration coefficients. The Sector agreed to a nonretroactive and effective date of January 1, 1999 for these changes:

> *S.2.4.3. **Calibration Transfer.** - The instrument hardware/software design and calibration procedures shall permit calibration development and the ~~mathematical~~ transfer of calibrations between instruments of like models <u>without requiring user slope or bias adjustments.</u>*
>
> *Note: Only the manufacturer or the manufacturer's designated service agency may make ~~calibration transfer~~ <u>standardization</u> adjustments on moisture meters. ~~and, except for instrument failure and repair, only at a prescribed period of time during the year~~. This does not preclude the possibility of the operator installing ~~the~~ manufacturer-specified calibration constants ~~or standardization parameters~~ under the instructions of the manufacturer or its designated service agency. <u>Standardization adjustments (not to be confused with grain calibrations) are those physical adjustments or software parameters which make meters of like type respond identically to the grain(s) being measured</u>. [Nonretroactive and effective as of January 1, 1999.]*

10. Proposed Addition to Publication 14 - V. Standardization of Instruments

Discussion: Earlier data compiled by Dr. Hurburgh suggested that instruments in the field (or in State Moisture Labs) may not be closely aligned with instruments of like type in the NTEP lab. The NTEP Laboratory has also seen unexplained differences between moisture results (using the same calibration and correcting for air oven differences) obtained on the same set of samples at 12-month intervals. In such cases, Phase II data collected on the NTEP lab instruments may not be useful in maintaining



calibrations and may not be representative of what can be expected with devices in the field. Manufacturers typically maintain a "standard" instrument (or instruments) against which production units are tested and adjusted to be within the manufacturer's acceptable tolerance limits. At the present time, there are no requirements for the NTEP lab instruments to be periodically compared with manufacturer's standard(s) or adjusted to agree with the manufacturer's "standard(s)." Thus, any change in performance over time in either the NTEP lab units or the manufacturer's "standard" units can result in a corresponding loss of accuracy (compared to air oven) in production units. The Sector has agreed that the NTEP units should be standardized against manufacturers' master units annually (typically between March 1 and May 30). The Sector has also agreed that the specific alignment details (e.g. what instrument parameters to measure, what adjustments to make, etc.) would vary with the technology involved and the manner in which that technology had been implemented, and that manufacturers should also be required to demonstrate that their methods for standardizing production units provide assurance that units "as shipped" will agree with the NTEP units within acceptable tolerances.

Decided: The Sector was in general agreement that Publication 14 should contain a section dealing with instrument standardization (such as the draft shown below); however, device manufacturers requested that a vote on adoption of the draft be delayed until the Sector's September 1997 meeting so they would have additional time to review the proposed tolerance limits.

V. Standardization of Instruments

Continuing participation in the on-going data collection and calibration review program (Phase II) is mandatory for all grain moisture meters. Annually, prior to Phase II data collection, device manufacturers are required to make a side-by-side comparison between their reference standard instruments and instruments of like type in the NTEP Participating Laboratory. The specific details of the comparison tests will vary with the technology involved, but manufacturers will be required to provide details of their test procedures to the NTEP Participating Laboratory and will be required to show that the mean moisture difference between Manufacturer's Laboratory Standard Meters and the corresponding NTEP Lab Meters (path A in figure below) does not exceed ± 0.2 x the maximum Handbook 44 acceptance tolerance. Manufacturers must also demonstrate that their methods for standardizing units in production result in "as shipped" units which agree with the corresponding NTEP Lab units (path D in figure below) within ± 0.3 x the maximum Handbook 44 acceptance tolerance.

11. Test Weight per Bushel Indications

Background: The Grain Moisture Meter Code in H44 contains the following field test requirement for Test Weight per Bushel Indications:

T.3. For Test Weight Per Bushel Indications or Recorded Representations. The maintenance and acceptance tolerances on test weight per bushel indications or recorded representations shall be 0.193 kg/hL or 0.15 lb/bu. The test methods used shall be those specified by the USDA FGIS. (Amended 1992)

Some time ago, when the Sector was discussing this requirement, the reasonableness of the tolerance, was questioned, especially as it applied to the test weight of corn. It was pointed out that the tolerance was taken from FGIS (now GIPSA) procedures using three samples of dockage-free dry hard red winter wheat and comparing the average of five replicate measurements (with the highest and lowest results discarded before averaging) on each sample using the "standard" quart container to a like average obtained with the container under test. The Sector agreed that the test was not realistic for assessing the performance of the various types of devices in commercial use and that a different tolerance should be considered for each grain type. The Sector considered dropping this section from the Moisture Meter Code, reasoning that it would be more appropriate to include it in a separate chapter of H44 devoted specifically to the requirements for test weight per bushel devices. Several members of the Weights and Measures Community objected, however, stating that deletion of this section, prior to the development of a separate code chapter, would leave them without inspection and enforcement authority over test weight devices.

There are now at least two NTEP Grain Moisture Meters which have the capability to automatically provide an indication and recorded representation of test weight per bushel. Because of the unrealistic tolerances in the existing Code, however, the test weight capability of these meters was disabled for the NTEP tests. Some State W&M Officials are permitting these devices to display and print the test weight information provided that some disclaimer appears on the printed ticket (e.g., the words "approximate" next to the test weight result) or that a warning against use of the information for commercial purposes is posted prominently on the device.

The issue was reviewed again at the Sector's March 1996 and September 1996 meetings. The Sector was in general agreement that Test Weight per Bushel devices (Grain Bulk Density Apparatus) should be addressed in Code separate from the Grain Moisture Meter Code (even for those grain moisture meters which were capable of providing a bulk density measurement).

Discussion: Grain industry representatives were concerned that the Sector might be "trying to invent a new method". They stressed the importance of achieving and maintaining uniformity with the official system. Toward that end, they wanted assurance that the reference method should be whatever GIPSA was using. GIPSA's volume reference is a "standard" one-quart kettle with loading- funnel, stand and hard maple strike-off stick. "Working" kettles are compared against the "standard" with a grain test (described above) and a water test. Suitably accurate scales determine the weight.

One grain industry member suggested that the Sector develop a mission statement on Test Weight. Other Sector members thought this was unnecessary as the Sector had already been charged with developing NTEP test procedures and recommending changes to H44 with the objective of aligning commercial devices with those used in the official system. Citing the wide range of devices now in commercial use (some of which are of questionable accuracy and permanence), one device manufacturer felt that development of H44 Code (and a corresponding Publication 14 check list) for Test Weight apparatus was needed to show what apparatus should be disallowed for commercial use. This view was supported by W&M members. One Sector member suggested that an "environmental scan" be conducted to determine what devices are actually in use in the field. The Sector Technical Advisor was of the belief that the list of devices characterized in the Sector's agenda (and reproduced below) was a good representation of the range of device types now in use (or under consideration for use) in the commercial system. Sector W&M representatives were asked to review this list and to be prepared to report, at the next Sector meeting, which of the device types listed are in commercial use in their respective jurisdictions. Lack of time prevented the Sector from discussing whether the proposed Code should cover all types and variations shown. This will be an agenda item for the next meeting.

a. **Test Kettle** with manual strike-off
   - Kettle Size: pint; quart; liter; half-liter
   - Scale Type: Beam balance (calibrated in mass units, chart or calculation required); Electronic scale (calibrated in mass units, chart or calculation required); Electronic scale (calibrated directly in test weight)

b. **Chondrometer**
   - Volume: one-fourth liter; half liter; liter

Scale Type: Beam balance (calibrated in mass units, chart or calculation required)
Electronic scale (calibrated in mass units, chart or calculation required)
Electronic scale (calibrated directly in test weight for selected grain type)

c. **Other** (incorporated into grain moisture meters or other grain measuring devices or constructed specifically as a test weight device not classified above)
Volume: Various (device dependent)
Operation: Fully automatic (with internal weighing device and direct display of test weight for selected grain type)
Manual filling and manual volume isolation (with internal weighing device calibrated directly in test weight for selected grain type)

12. Phase II Funding

Under a five year agreement, funding for Phase II (Calibration Maintenance) testing comes from cooperative agreements between NIST, GIPSA, and participating device manufacturers. NIST and GIPSA contribute $36,000 per year, and each participating manufacturer contributes $3,500 per meter type per year. With 3 years remaining under this agreement, Tina Butcher, NIST, suggested that the Sector might want to locate alternate funding sources before the agreement expires. Sector members were pessimistic about obtaining funds from the obvious sources. With GIPSA and NIST being asked to cut expenses, the likelihood that they will be able to continue to support the program at current levels is slim. From previous attempts to obtain funding, it appears highly unlikely that Congress would appropriate anything for this program as a separate item. Although the most equitable way to obtain funds seems to be a "tax" or annual fee assessed against each commercial moisture tester in use commercially, administrative problems (as well as the problems of obtaining participation from every state) rule out this approach. Grower check-off programs fall into the same category. At the present time, there are only six devices holding CC's. If device manufacturers were asked to bear the full cost of Phase II (for Grain Moisture Meters only), each manufacturer would have to pay about $15,000 to $17,000 annually. Grain Moisture Meters are not sold in huge quantities. If the manufacturer were to recover this amount on current sales of 300 units per year, this would translate into a price increase of $50 to $56 per meter. It is doubtful that anyone selling less than 100 units per year would want to remain in the program. The situation becomes worse if the number of manufacturers participating drops from its present number. One member questioned the benefit of continuing to participate in the program for more than 5 years. At that point, he suggested, the meters should be well aligned and further changes should only be incremental. Recalling that commercial meters were poorly aligned in 1980 until meter manufacturers re-adjusted calibrations based on data collected Iowa State University and the University of Illinois, another member pointed out that the Sector wouldn't be having this discussion if those one-time adjustments had kept meters aligned. He maintained that without an on-going monitoring program, meters would eventually drift apart again.

A three-pronged approach to funding was suggested:

1) Prepare a report to the House Agriculture Committee which: a) outlines our goals; b) explains what has been accomplished; c) makes a strong case for continuing the on-going calibration maintenance program, stressing the economic value to producers and grain trade alike; and d) shows the potential loss to producers and the grain trade when meters within the commercial system drift apart from each other.
2) Prepare a report for presentation to the NTEP Board of Governors (BOG) which shows: a) the benefits of the on-going calibration maintenance program; b) what sources have been considered for funding; and c) why these sources don't work.
3) Ask the BOG and the NCWM to petition NIST for funds.

Cliff Watson, Consultant, offered to assist in the preparation of these reports, with the goal of having a draft report available for approval by Sector voting members prior to the NCWM Annual Meeting in July. Although the discussion had focused on funding for the Grain Moisture Meter program, it was suggested that the reports should also include reference to the NIR program which will also need funding for an on-going monitoring program.

13. Mission of the Sector

Cliff Watson, Independent Consultant, reported that the GEAPS Grades and Weights Committee had discussed the NTEP moisture meter program at the annual GEAPS (Grain Elevator and Processor Society) meeting in Minneapolis. At this meeting, some members of the committee expressed the belief that the NTEP Grain Moisture Meter Sector had lost sight of its mission and that it was more concerned about regulations and reduction of fraud than achieving uniformity in grain inspection. As a result of the discussion, the Grades and Weights chairman stated that he would contact NGFA and others to see about having this matter included in the Grain Quality Workshop agenda for discussion and action.

Cliff recommended that the Sector give assurance to all concerned that uniformity of grain moisture measurements between official and commercial systems and within the commercial system is the primary mission and objective of the Sector. The regulations recommended by the Sector are the means by which uniformity will be achieved and maintained.

In the discussion which followed, one Grain Industry representative commented that the Sector spent a lot of time on Publication 14 and Handbook 44 rather than talking about the strategic direction their programs should take and how these programs might work in the field; especially in states like Illinois. He believed that some of the Handbook 44 requirements were a disincentive for states to adopt an NTEP program for moisture meters. For the program to succeed, he stressed that it must be as regulatory simple as possible. Another Grain Industry representative cited the needs of the industry: 1) meters that agree with the official system; 2) affordable meters; 3) reasonable assurance that any meter purchased [under the program] can be used for a number of years; and 4) uniformity between states. At the same time, citing the competitiveness of the industry, he pointed out that industry was always seeking to reduce costs and did not want to "freeze" technology; larger, progressive operations wanted multi-constituent meters.

Responding to some of these comments, other Sector members pointed out that the Sector was a *technical* sector. As such, it was appropriate for the Sector to deal primarily with *technical* issues related to its objectives of: (1) developing type evaluation criteria, test procedures, and data analysis criteria; (2) recommending changes to Handbook 44 to update the code to accommodate the latest technology; (3) improving (*and maintaining*) the uniformity of grain moisture measurement between the official and commercial systems and within the commercial system; (4) setting up a type evaluation program toward the accomplishment of (3); and (5) providing assistance to regulatory officials by defining an infrastructure to support testing and inspection of grain moisture meters and associated equipment. Strategic direction for the Sector comes from the NTEP Board of Governors. Input on how the Sector's proposals might work in the field comes from the active participation of Device Manufacturers, Weights and Measures officials, and Grain Industry representatives in Sector activities. Additional review of the Sector's proposals comes from NCWM Regional Committees, from the NCWM S&T Committee, and from Delegates to the NCWM Annual Meeting.

The Sector was in agreement that much of the negative opinion expressed regarding Sector activities and the resulting programs was due to misunderstandings and unreasonable expectations about the programs. Some of the misunderstandings were believed to have their roots in Grain Press articles which had taken information out of context or which played to the fears and sensitivities of the industry. It was suggested that a news release from NIST, in the form of frequently asked questions, might be a good way to clear up some of the misunderstandings.

In conjunction with this discussion, the Sector reviewed a Memorandum, dated February 27, 1997, sent to the Sector by Sid Colbrook, Illinois Department of Agriculture, Bureau of Weights and Measures (See Attachment). The Sector had the following comments:

Regarding the question of enforcement, while NIST, OWM and the National Conference on Weights and Measures encourages uniformity through the adoption of NIST Handbook 44, enforcement of the code depends on the provisions that are within the individual State laws. The Code does not prohibit the continued use of non-NTEP devices which were manufactured or in service prior to the non-retroactive (and effective) date. GIPSA has announced that it will be choosing a new meter for official inspection in June of 1997 and expects to put the new meters into service on some grains in May of 1998. The non-retroactive provisions of the Code do not become effective until January 1, 1998. Noting that almost every elevator in the State of Illinois presently have at least one Motomco 919 (the current meter used in official inspection) some Sector members wondered how many *new* Motomcos would be expected to be put into service in Illinois in 1998 should GIPSA not adopt a new meter as scheduled.

Because the Sector is not qualified to give legal advice, the Sector suggests that Mr. Colbrook consult his States Attorney's Office for advice on the matter of whether or not a regulatory agency can be held financially accountable if a terminal or elevator purchases an NTEP approved device later found to be inaccurate. One Sector member offered the opinion that to establish liability on the part of the regulatory agency in such a case, the elevator or terminal would have to prove that the condition (the inaccuracy) existed at the time the agency's inspector approved the device. When GIPSA adopts a new meter for official use, the Motomco 919 will no longer be the device which establishes the official grade.

Regarding the question of accuracy, many participants in the grain industry have indicated that their primary interest is in uniformity (agreement with the official system). Accuracy (agreement with the standard air oven) is of secondary interest. The matter of uniformity relates to improving overall system performance. In that regard, uniformity might be considered "system accuracy." There are a number of reasons that NTEP meters will improve uniformity or "system accuracy." A few of these are: (1) the automatic features of NTEP meters take the operator out of the process, eliminating possible human errors (GIPSA field experience has shown substantial improvement in system performance when the operator was removed from the grain protein measurement process); (2) NTEP devices have been tested for stability and permanence over a range of operating voltages,

temperatures, and humidity; (3) NTEP devices provide error messages when operating ranges have been exceeded, preventing unintentional errors; (4) NTEP meters are subject to an annual on-going calibration review and maintenance program to keep their Certificates of Conformance active; and (5) NTEP device manufacturers are provided with calibration data collected on the same sample set used by GIPSA for calibrating the official meters. Grain handlers have acknowledged that automatic features contribute to improved efficiency, allowing the operator to perform other tasks at the same time moisture measurements are being made.

NTEP meters will not display (nor print) a result in either of the following situations: (1) the device is outside its operating temperature range; (2) the temperature of the grain exceeds the range specified; or (3) the temperature difference between grain and meter exceeds the specified difference.

The NTEP meters will display a result if (4) the grain moisture value is outside the moisture range listed on the CC, but it must be accompanied by a clear indication that the moisture range has been exceeded [H44, Sec.5.56.(a), S.1.3. Operating Range]. The Sector established these requirements to ensure that measurements would be made under the same conditions which the NTEP lab used to evaluate device performance.

In the case of grain moisture value being outside the moisture range on the CC, the Sector reasoned that a moisture reading at in this case was, better than no reading at all, because there was little that the buyer or seller could do to remedy the situation at that time. Requiring a clear indication of "moisture limit exceeded" alerts both buyer and seller that the measurement may not be within H44 tolerances. Fortunately, most of the grain an elevator receives will be within the moisture range for which meters have been calibrated.

As to inhibiting measurements when any of the temperature conditions are not within limits, the Sector reasoned that the two conditions most likely to be encountered were: grain temperature exceeds limits (most likely frozen grain) and difference between grain temperature and device temperature exceeds limits. In the first instance, elevators have already developed a strategy to handle this condition. They seal the grain sample in a pint jar marked with the producer's code and hold it for later determination of the moisture which will appear on the settlement sheet. It is not often that this strategy has to be employed during harvest in Illinois. When the difference between grain temperature and device temperature exceeds limits, the operator has only to run the sample a second time. This is normally sufficient to allow the sample to warm up (or cool down) to an acceptable range. Running the sample a second time takes only 30 to 45 seconds for most NTEP meters. This seems a small penalty to pay for a more accurate measurement. The frequency with which a second measurement will have to be taken depends on the maximum allowable difference between grain and meter specified by the manufacturer. This varies from a minimum of ±10 °C to about ±20 °C depending on the device. The moisture ranges and grains for which a meter has been calibrated also vary depending on the device. A potential purchaser should carefully review the CC of the device to be purchased to make certain it has the desired characteristics.

In developing Code for Grain Moisture Meters, the Sector was careful not to make the Code technology specific. To the best of the Sector's knowledge, there is nothing in the Code that restricts the development or introduction of meters using new technology. Accuracy (air oven vs. meter) will always be limited by the fact that grain is a biological product whose characteristics change over time. All of the present technologies use indirect methods of measuring the moisture content of the grain. Dielectric type meters use the relationship between the bulk capacitance of a grain sample and moisture as the basis for their measurements. Near Infrared Instruments measure the energy absorbed by water molecules within the sample at specific wavelengths of near infrared light. Each of these technologies has its advantages and disadvantages. Both are affected in varying degrees by characteristics of grain which vary with variety, growing conditions, temperature, kernel size, shape, density, etc. The greatest potential for immediate improvement in perceived accuracy will be found in things which promote uniformity within the system. The Sector is actively involved in looking at ways to ensure that meters, as shipped, and in the field will remain closely aligned with like meters in the NTEP laboratory. The Sector will continue to seek additional means of bringing all NTEP meters into the closest alignment possible with the technologies involved. A positive attitude toward the moisture program by W&M officials in existing NTEP states and their assistance in urging other grain states to adopt an NTEP moisture program will also help in achieving nation-wide system uniformity.

14. GIPSA Response to NTEP Needs

Citing unusually long delays in getting CC's issued for devices which been approved over a year ago and delays in getting the NTEP program up and running for NIR protein analyzers (NIR), Cliff Watson, Consultant, recommended that the Sector ask GIPSA to respond in a more timely manner to the needs of manufacturers with regards to the NTEP program. Diane Lee, NIST, noted that the process for drafting CC's had recently been changed to make it possible to publish CC's in a more timely fashion. She reported that draft CC's were now available for manufacturers to review. These would be published as soon as manufacturers responded. Mr. Watson was concerned that support would be lost for the NIR program if something couldn't be done to get it

priority be assigned to setting up the NIR program. Dr. Pierce related some of the staffing problems he had experienced and explained that his responsibilities at GIPSA extended well beyond those associated with running the NTEP grain moisture meter (GMM) program and setting up the NIR program. He believed that a letter would not produce additional resources and noted that getting the NIR program started would take a lot more resources than keeping the GMM program going. Any resource diverted to setting up the NIR program would jeopardize the GMM program. The Sector was in general agreement that the NIR program should not be implemented at the expense of the GMM program. It was recognized that because many states had formal regulatory programs for moisture meters, priority must be given to moisture issues. Dr. Pierce expressed the belief that once the GMM program had been "de-bugged" and was functioning as expected, the effort to keep it going would not be as great as it presently was. At that point work on the NIR program could be resumed.

Attendance List - Sector Meetings March 10-12, 1997, Atlanta, GA

Name	Affiliation	March		
		10	11	12
Jack Barber	JB Associates	x	x	x
Connie Brown	DICKEY-john Corp.	x	x	x
Randy Burns	Arkansas Bureau of Standards	x	x	x
Tina Butcher	NIST/OWM	x	x	
Marty Clements	Steinlite Corporation	x	x	x
Tim Conwell	CSC Scientific	x	x	x
Cassie Eigenmann	DICKEY-john Corp.	x	x	x
Rich Flaugh	GSF, Inc.		x	x
David Hopkin	Sinar Technology	x	x	x
Charles R. Hurburgh Jr.	Iowa State University	x	x	
David Krejci	GEAPS	x	x	x
G. Diane Lee	NIST/Office of Weights and Measures	x	x	x
Keith Locklin	ConAgra Corn Processing (representing GEAPS)	x	x	x
Chuck Lowden	Foss Food Technology	x	x	x
Pontus Nobreus	Perstorp Analytical	x	x	x
Ray Oberg	Zeltex, Inc	x	x	x
Tom O'Connor	National Grain & Feed Association	x	x	x
Carla Pesce	Georgia Weights & Measures	x	x	
Richard Pierce	USDA-GIPSA-TSD	x	x	x
Neal Rooks	Georgia Weights & Measures	x	x	x
Joe Rothleder	California Dept. of Food & Agriculture	x	x	x
Tom Runyon	Seedburo Equipment Co.	x	x	x
Cheryl Tew	North Carolina Dept. Of Agriculture	x	x	x
Cliff Watson	Consultant	x	x	x
Robert Wittenberger	Missouri Dept. of Agriculture, Div. Weights & Meas.	x	x	x
Richard (Will) Wotthlie	State of Maryland	x	x	x

Appendix O
NCWM Budget for FY 1998

GENERAL ACCOUNT

Category Number	Account Description	Proposed FY 98 Budget
	Income	
410	General Revenues	
411	Registration Fees	**$70,000.00**
411.1	Annual Meeting $55,000.00	
411.2	Interim Meeting $15,000.00	
412	Membership Fees	**$115,000.00**
413	Interest	**$2,500.00**
416	Other Income	**$400.00**
480	Service Revenues	
481	Special Events	**$1,000.00**
482	Publications	**$4,500.00**
	NTEP Administrative Fee	**$21,000.00**
485	Promotional	**$2,000.00**
	TOTAL INCOME	**$216,400.00**
	EXPENSES	
510	General Expenses	
511	Annual Meeting	
511.1	Hotel and Meeting Space	$21,000.00
	Chairman's Reception $7,500.00	
	Breakfast 8,400.00	
	Luncheon 2,000.00	
	Souvenirs 2,500.00	
	Chairman's Suite 600.00	

Category Number	Account Description	Proposed FY 98 Budget
511.2	AV Equipment	$1,000.00
511.3	Extra Personnel and Photographer	$2,000.00
511.4	Printing and Copying	$2,500.00
511.5	Awards	$3,000.00
511.6	Treasurer/Committee Expenses	$1,000.00
	Conference Outing	$7,500.00
	President's Dinner Meeting	$1,500.00
	Miscellaneous	$2,500.00
	Total Annual Meeting	**$42,000.00**
512	Interim Meeting	
512.1	Hotel and Meeting Space	$8,000.00
	Breakfast and Reception $8,000.00	
	AV Equipment	$1,000.00
	Printing	$2,000.00
	Miscellaneous	$1,000.00
	Total Interim Meeting	**$12,000.00**
513	Committee Meetings	
513.1	Executive Committee	$10,000.00
513.2	L & R Committee	$4,000.00
513.3	S & T Committee	$4,000.00
	S&T Chair travel to SMA	$2,000.00
513.4	A & P Committee	$4,000.00
513.7	Annual Committees	$3,000.00
	Other Committee Meetings	$12,000.00
	Total Committee Meetings	**$39,000.00**
514	Task Forces & Special Committees	
	Program Evaluation (Reports to A&P)	$6,000.00
	HB 133 Handbook (Reports to L&R)	$4,000.00

Category Number	Account Description	Proposed FY 98 Budget
	Legislative Liaison (Reports to Executive)	$4,000.00
	Metrology (Reports to Executive)	$1,500.00
	Strategic Plan (Reports to Executive)	$10,000.00
	Total Task Forces & Special Committees	**$25,500.00**
515	Chairman/Chairman Elect	
	Chairman	$10,000.00
	Chairman-Elect	$10,000.00
	Total Chairman/Chairman Elect	**$20,000.00**
516	Administration	
516.1	Equipment/supplies/stationery	$2,500.00
516.2	Contract Personnel	$18,000.00
516.3	Mail/ PO Box	$300.00
516.4	Treasurer's Bond	$500.00
516.5	Interest Expense/Bank Charges	$1,200.00
516.6	NTP	$2,000.00
	Legal Services	$2,500.00
	Insurance	$1,500.00
	Auditing Services	$5,000.00
516.9	Miscellaneous	$500.00
	Total Administration	**$34,000.00**
517	Printing and Publications	
	Annual Agenda	$7,500.00
	Interim Agenda	$4,000.00
	Membership	$3,000.00
	Membership Publications	$10,000.00
	Total Printing and Publications	**$24,500.00**

Category Number	Account Description	Proposed FY 98 Budget
581	Special Events	**$1,500.00**
585	Promotional Items	**$500.00**
	TOTAL INCOME	**$216,400.00**
	TOTAL EXPENSES	**$199,000.00**

Appendix O (Continued)
NCWM Budget for FY 1998

NTEP ACCOUNT

Category Number	Account Description		Proposed FY 98 Budget
600	GENERAL REVENUE		
600.1	Maintenance Fees		**$140,000.00**
660	SALES		
661	Publications		
661.1	Publication 14	$5,000.00	
661.2	Publication 13	$5,000.00	
	Total Sales		**$10,000.00**
665	NTEP LOGO		
665.1	Seals		**$1,000.00**
670	INTEREST INCOME		**$6,000.00**
680	MISCELLANEOUS INCOME		**$3,000.00**
	TOTAL INCOME		**$160,000.00**
700	ADMINISTRATIVE EXPENSES		
701	Administration (15% Maintenance Fee)		$21,000.00
702	Personal Services		$30,000.00
	Legal Services		$2,500.00
	Insurance		$1,500.00
	Auditing Services		$5,000.00

Category Number	Account Description	Proposed FY 98 Budget
705	Supplies	$5,000.00
	Total Administrative Expenses	**$65,000.00**
710	Board of Governors	
710.4	Appeal Hearing	$10,000.00
710.5	Technical Committee Meeting	$10,000.00
	Other Special Meetings	$8,000.00
	Total Board of Governors	**$28,000.00**
715	PARTICIPATING LABORATORIES	
715.1	NTEP Laboratory Training	**$12,000.00**
720	INTERNATIONAL MEETINGS	
721	OIML	$10,000.00
722	USA/Canada Work Group	$12,000.00
	Total International Meetings	**$22,000.00**
725	SPECIAL COMMITTEES	
725.1	Software Group	**$3,500.00**
730	TECHNICAL COMMITTEE - WEIGHING SECTOR	
730.1	Technical Committee Meeting	$21,000.00
730.3	Multiple Dimensional Devices	$3,500.00
	Total Weighing Sector	**$24,500.00**

Category Number	Account Description	Proposed FY 98 Budget
731	TECHNICAL COMMITTEE - BELT CONVEYOR	
731.1	Technical Committee Meeting	$5,000.00
	Total Belt Conveyor Sector	**$5,000.00**
740	TECHNICAL COMMITTEE - MEASURING SECTOR	
741.1	Technical Committee Meeting	$14,000.00
	Sub Committee	$8,000.00
	Total Measuring Sector	**$22,000.00**
750	EXPENDITURE OF DEDICATED FUNDING	
750.1	Grain Equipment Cooperative Agreement Committee	**$14,000.00**
760	SALES	**$16,000.00**
761	Publications	
761.1	Publication 14	
761.2	Publication 5	
765	NTEP LOGO	
765.1	Seals	**$1,000.00**
770	INTEREST EXPENSE/BANK CHARGES	**$500.00**
780	MISCELLANEOUS EXPENSE	**$1,000.00**
INCOME		**$160,000.00**
EXPENSE		**$214,500.00**

Report of the Laws and Regulations Committee

Stanley K. Millay
Weights and Measures Supervisor
Maine Department of Agriculture

Reference
Key Number

200 Introduction

This is the Report of the Laws and Regulations Committee (Committee) for the 82nd Annual Meeting of the National Conference on Weights and Measures (NCWM.) It is based on the Interim Report offered in the Conference "Program and Committee Reports" (NCWM Publication 16), 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 presented below were adopted as presented when the Committee's report was approved.

Table A identifies agenda items by Reference Key Number, title, and page number. The first three digits of the Reference Key Numbers of the items are assigned from the subject series listed below. Voting items are indicated with a "V" after the item number. Consent calendar items are marked with a "VC." Items marked with an "I" after the item number are for information. Table B lists the appendices to the report, and Table C provides a summary of the results of the voting on the Committee's items and the report in entirety. This report contains recommendations to amend National Institute of Standards and Technology (NIST) Handbook 130, 1997 edition, "Uniform Laws and Regulations," or NIST Handbook 133, "Checking the Net Contents of Packaged Goods," Third Edition and Supplements 1 (1990), 2 (1991), 3 (1992), and 4 (1994). Revisions proposed by the Committee are shown in **bold face print** by ~~crossing out~~ what is to be deleted and underlining what is to be added. New items proposed for the handbooks are designated as such and shown in **bold face print.** Proposals presented for information are shown in *italic* type unless identified as informational. The section mark, "§," is used in most references in the text and is followed by the section number and title, (for example, § 1.2. Weight.) When used in this report the term "weight" means "mass."

Subject Series

Handbook 130 - General	210 Series
Uniform Laws	220 Series
Weights and Measures Law (WML)	221 Series
Weighmaster Law (WL)	222 Series
Engine Fuels, Petroleum Products, and Automotive Lubricants Inspection Law (EFL)	223 Series
Uniform Regulations	230 Series
Packaging and Labeling Regulation (PLR)	231 Series
Method of Sale of Commodities Regulation (MSCR)	232 Series
Unit Pricing Regulation (UPR)	233 Series
Voluntary Registration of Servicepersons and Service Agencies for Commercial Weighing and Measuring Devices Regulation (VREG)	234 Series
Open Dating Regulation (ODR)	235 Series
National Type Evaluation Regulation (NTER)	236 Series
Engine Fuels, Petroleum Products, and Automotive Lubricants Regulation (EFR)	237 Series
Interpretations and Guidelines	238 Series
Price Verification	239 Series
NIST Handbook 133	250 Series
Other Items	260 Series

Table A Index to Reference Key Items

Table B
Appendices

Table C
Voting Results

Reference Key No.	House of State Representatives		House of Delegates		Results
	Yes	No	Yes	No	
200 (Consent Calendar)	58	0	41	0	Passed
237-2	22	17	33	25	Failed
237-3 (Motion to Hear Amendment)	34	0	34	0	Passed
237-3 (Motion to Amend)	1	37	3	47	Failed
237-3 (No Change)	34	1	50	5	Passed
200 (Report in its Entirety)	38	0	63	0	Passed

Details of All Items
(In order by Reference Key Number)

210 NIST Handbook 130 - General

210-1 I Ensuring the Uniform Packaging and Labeling Regulation (PLR) is Identical to Federal Regulations

As of the Annual Meeting, the Food and Drug Administration (FDA) had not issued final regulations to implement the metric revisions made to the Federal Fair Packaging and Labeling Act in 1992. The Committee will contact FDA to request that final regulations be issued before the 1998 Interim Meetings so any changes needed in the handbook can be developed for NCWM consideration at the 83rd Annual Meeting.

231 Packaging and Labeling Regulation

231-1 I Declaration of Responsibility on Imported Products

Source: Western Weights and Measures Association

Discussion: Many imported products do not conform to the requirements of the Uniform Packaging and Labeling Regulation (PLR) and the Federal Fair Packaging and Labeling Act (FPLA). Typically, packages manufactured in the United States are brought into compliance by contacting the U.S. based responsible party stated on the package. The move to a global economy has reduced the consumer and industry protections provided by FPLA when the responsible party for the non-compliance package is located outside of the United States. Factors that contribute to this are: increased investigation time, cost, distance, language barriers, etc. These factors limit the ability of weights and measures officials to obtain corrective action and to prosecute repeat or non-compliant foreign based firms. Without these tools, there are few economic incentives for the manufacturer to comply with the requirements of the United States. The Western Weights and Measures Association recommended that NCWM support amendments to the FPLA that require the name and address of a U.S. based responsible party on all packaged products sold or offered for sale in this country.

The Committee received comments indicating that widespread labeling violations have existed for years and that the packages originate from both domestic and foreign firms. The National Association of Consumer Agency Administrators (NACAA) submitted written comments supporting the Western's proposal to require a United States based resident agent for all consumer commodities. NACAA is concerned about a variety of violations including, but not limited to, short fill, mislabeled product, defective materials and especially unsafe product, all of which can only be resolved through contact with a responsible party. However, it was pointed out that additional information is required, from both industry and government officials, in order to effect an appropriate solution. The Industry Committee on Packaging and Labeling (ICPL) has agreed to ask its membership to recommend possible solutions which would not impede on free trade. The ICPL recommended that the Committee contact the appropriate Federal Agencies (e.g., Customs, Federal Trade Commission, and the Food and Drug Administration) requesting information on existing laws dealing with the traceability (i.e., relation to the source of production, and accountability for the product) in order to obtain corrective action or taking enforcement action against foreign manufacturers or distributors.

The Committee supports additional study of the issue and will forward it to the regional associations for comment. The Committee did agree that one tool available to weights and measures officials in resolving problems with violative packages is to hold retailers responsible for the packages. The Committee and the ICPL take the position that retailers should be held responsible for offering mislabeled or otherwise violative packages for sale in their stores. This approach may well be one of the most effective means for correcting the problem since retailers can work with their suppliers to make sure that the products they purchase are in compliance with weights and measures laws.

232 Method of Sale of Commodities Regulation

232-1 I 2.4 Fireplace and Stove Wood

Source: Central and Southern Regional Associations

Discussion: The Central Weights and Measures Association submitted a proposal to amend §2.4 to establish a method of sale for flavoring chips. The Southern Weights and Measures Association amended the Central proposal by specifying that flavoring chips be sold by weight instead of volume. Comments received by the Committee at the Interim Meeting indicated that there were still issues to be resolved regarding this proposal. Concern was raised that the definition as proposed was unclear and might conflict with the proposed method of sale due to unspecified quantity limitations. Comments were also received which indicated that the industry involved prefers that the method of sale be by volume. The Committee also feels that moisture loss needs to be considered before a method of sale by weight is considered. The Committee believes that wood flavoring chips may already be effectively addressed in Section 2.4.3.(a) - Packaged Natural Wood, but this section includes requirements that may not be appropriate for small packages. Given the comments received, the Committee feels that the item should be returned to the regional associations for further study and comment.

Alternate Proposal: The Committee is presenting the following amendments to the method of sale of commodities regulation for consideration by the regional associations:

Amend Section 2.4. Fireplace and Stove Wood, to include flavoring chips:

> **2.4. Fireplace and Stove Wood. — For the purpose of this regulation, this section shall apply to the sale of all wood, natural and processed, for use as fuel or flavoring.**

Amend Section 2.4.1. Definitions, by adding the following definition for flavoring chips:

> **2.4.1. Definitions. --**
>
> **2.4.1.4. Flavoring Chips. — Any wood, natural or processed, advertised, offered for sale or sold for flavoring smoked or barbequed foods.**

Amend Section 2.4.3. Quantity, by adding a new Section d. Flavoring Chips to require them to be sold by volume:

> **d. Flavoring Chips. — Natural or processed wood offered for sale in packages in quantities less than 85 L (3 cu ft) shall be sold by volume.**

232-2 VC 2.5. Peat and Peat Moss

(This item was adopted as part of the consent calendar.)

Source: Canadian Sphagnum Peat Moss Association

Recommendation: Amend Section 2.5.2.2. Cubic Measure by deleting the struck-through material as follows:

> **2.5.2.2. Cubic Measure. -- Peat and peat moss sold in terms of cubic measures shall be offered and exposed for sale only in liters and/or cubic feet. If the commodity is labeled in terms of compressed cubic measurement, the quantity declaration shall represent the quantity in the compressed state. ~~and the quantity from which the final product was compressed (the latter declaration not exceeding the actual amount of material that can be recovered~~.**

Discussion: The current wording in §2.5.2.2. in the Method of Sale Regulation requires peat producers to estimate what quantity each bale will yield. Producers ability to accurately identify the recoverable product is dependent on many variables such as: (1) variability of weather (dry and sunny conditions versus wet) can affect product to impact yields (2) moisture content of the product when baled (3) yield will vary from region to region and from bog to bog based on decomposition, depth from which harvested and degree of fiber (4) bales stored over a winter result in different yields than if opened soon

after packing. At the Interim Meeting the Committee received numerous comments in support of this amendment and therefore recommends adoption of this item.

233 Uniform Unit Pricing Regulation

233-1 VC Regulation Update and Revision

(This item was adopted as part of the consent calendar.)

Source: Laws and Regulations Committee

Recommendation: Adopt the Uniform Unit Pricing Regulation as presented in Appendix A.

Discussion: In 1993 the Committee was contacted by several weights and measures jurisdictions and retail trade associations requesting that the Uniform Unit Pricing Regulation (UPR) be updated to add new commodity groups and pricing requirements. The comments indicated that many commodity groups for nonfood products were not included in the table and that some of the required units may not be appropriate for many of the new products being sold in stores. Another concern was that the UPR specified pricing only on the basis of price per pound on most products sold by weight. This has resulted in some jurisdictions not enforcing the requirements on stores that voluntarily unit price on the basis of price per ounce instead of price per pound. The Committee believes that the UPR should be revised to encourage wider adoption and use of the uniform regulation and that provisions for unit pricing in metric units should be included.

At the 1996 Interim Meeting the Committee drafted a revision of the regulation (see Appendix A) to permit retail stores that voluntarily provide unit pricing to present prices using various units of measure. The Committee eliminated the table of product groupings because it is difficult to keep it up to date and it was not all inclusive so some newer products were not included under the uniform requirements. The table was replaced with requirements that specify that the unit price is to be based on price per 100 grams or price per kilogram, or price per ounce or pound if the package is labeled by weight. For example, the proposed revisions would require the unit price for soft drinks sold in various package sizes (e.g., 12 fl. oz. cans through 2-liter bottles) to be uniformly and consistently displayed in terms of either price per fluid ounce, or price per quart, or price per liter. The Committee also increased the price of commodities exempted from unit pricing from 10 cents to 50 cents. The Committee believes these revisions will ensure that unit pricing information facilitates value comparison between different package sizes and/or brands offered for sale in a store.

The Committee also considered several comments on this item from members of the U.S. Metric Association (USMA). Most of these comments suggested that the UPR be amended to require unit pricing in metric units and permit inch-pound unit pricing to be provided voluntarily. In response to this request, the Committee included guidelines for unit pricing in both metric and inch-pound units in its revision. The Committee would like to make it clear that the UPR applies only when stores voluntarily provide unit pricing information. Its purpose is to provide a standard that retailers must follow to ensure that consumers will have pricing information to help them make value comparisons. The decision to provide unit price information in metric or inch-pound units rests with retailers who will respond to consumer preference. The Committee believes that consumer preference will be the deciding factor as to when and how quickly metric unit pricing is used in the marketplace. Therefore, the Committee does not support amendments to include mandatory provisions in the UPR as these provisions would take the decision to go to metric unit pricing out of the hands of consumers and retailers. Finally, the Committee does not want to include any requirement that may discourage retailers from voluntarily providing unit price information.

237 Uniform Engine Fuels, Petroleum Products, and Automotive Lubricants Regulation

237-1 I Define Grades for Diesel Fuel Based on Cetane Rating

Source: Southern Weights and Measures Association (SWMA)

The SWMA requested that the NCWM adopt a definition of "regular" diesel fuel (e.g., a cetane rating below 45) and "premium" diesel fuels (e.g., a cetane rating of 45 or more) so that these fuels can be accurately and clearly identified.

Refiners have requested product registration from State Motor Fuel programs for diesel fuels that have been formulated to provide cleaner emissions or higher performance. Several refiners and marketers want to differentiate these grades of diesel fuels in the marketing process. A cetane rating could be an indicator of fuel quality similar (but not equal to) to the octane rating used for gasolines, and could serve to aid motorists in comparing the value and cost of the different "grades" of diesel fuels. The Petroleum Subcommittee was charged with investigating the means of defining these fuels. A Premium Diesel Work Group was formed and a work plan developed to address this issue. The work group consists of representatives of State petroleum programs, fuel producers, the fuel additive industry, and a representative from the Engine Manufacturer's Association (EMA).

Summary of Premium Diesel Work Group Report to the Laws and Regulations Committee

The Premium Diesel Work Group submitted a detailed diesel report to the Committee at the January 1997 Interim Meeting in Rockville, Maryland. The report outlined the group's progress and the technical considerations being examined for premium diesel. Additionally, the views of state regulators, the perspectives of the chemical manufacturers industry, the engine manufacturers, and the petroleum industry, along with individual letters submitted from Citgo and Mobil, are presented in the report. The initial work group report identifies five properties of diesel; cetane number, lubricity, detergency, API Gravity, and low temperature properties. The criterion for including each characteristic was based on a function benefit to the user at higher levels of enhancement than required by ASTM D 975 Standard Specification For Diesel Fuel Oils, and the availability of a test method.

Cetane: Cetane Number is a measure of the ignition quality of diesel fuel. Higher cetane number fuels result in a shorter ignition delay period, lower combustion noise, improved combustion control, easier starting, faster warmups, and reduced white smoke.

Lubricity: Fuels with enhanced lubricity minimize friction between, and damage to, surfaces in relative motion under a load. In particular, diesel fuel provides lubrication in certain parts of fuel injection equipment, such as rotary distributor pumps and injectors. Reduced wear can extend the life of some components.

Detergency: Detergent additives are useful in preventing carbon deposits on fuel injectors that interfere with fueling and fuel spray patterns. The formation of lacquer and carbon deposits also cause injector needles and pump plungers to stick resulting in a loss of power and fuel economy while increasing exhaust emission and smoke. Deposits on injector tips can affect fuel flow and atomization which also affect power, fuel economy, and emissions.

API Gravity: API (American Petroleum Institute) gravity is a measure of specific gravity or density (weight per unit volume) for petroleum fuel. As API gravity increases, the thermal energy content of the fuel is decreased. Therefore, a maximum API gravity or a minimum BTU content for premium diesel could assist in maintaining engine power and minimizing fuel consumption.

Low Temperature Properties: While adequate low temperature properties are essential for all diesel fuels, this area is of such wide concern and interest to the user segment of the industry, it is not being precluded from consideration as part of a premium diesel specification. Under low temperature conditions, paraffinic compounds of diesel may precipitate as wax, causing engines to malfunction or stall from blocked fuel system lines and filters.

With diverse views presented to the work group on the subject, the group concluded that a recommendation should be developed in cooperation with ASTM. This suggestion has led to the formation of a joint NCWM/ASTM Premium Diesel Task Force. The membership of this task force was formed at the December 1996 ASTM D 2 meetings, and the first working session was held at the offices of the PMAA during the week of the NCWM Interim meetings. The continuing objective of this joint work group is to develop a recommendation for incorporation in the Uniform Engine Fuels, Petroluem Product, and Automotive Lubricants Law and Regulation concerning "regular" and "premium" diesel so that these fuels can be accurately and clearly identified through dispenser labeling or other means. In response to the SWMA request for the NCWM to adopt a definition for "premium" diesel fuel, the petroleum subcommittee's premium diesel work group has continued to pursue this issue. The work group provided a progress update to the Laws and Regulations Committee at the 82nd annual meeting which indicated that a recommendation would be submitted to the L & R committee in time for discussion at the January 1998 NCWM Interim Meeting.

Status Report as of the 82nd Annual Meeting

The premium diesel work group has had four meetings since the January 1997 NCWM Interim meeting, including a work group assembly the week of the 82nd Annual NCWM. The work group is focusing on formulating qualifying parameters for "premium" diesel based on properties that provided a functional benefit to the user. The properties selected and limits chosen are being derived from available research data. Six Action Teams formed in January 1997 have made initial recommendations to the work group based on the functionality and practicality of six diesel fuel properties. Properties under review include cetane number, lubricity detergency, BTU content, low temperature operability, and thermal stability.
The work is striving for a manageable alternative that will allow marketers to choose a minimum number of qualifying properties a particular fuel would posses and post the values on a uniform labels. Petroleum quality enforcement would be based on the properties declared on the dispenser label.

237-2 V Nozzle Requirements for Diesel Fuel Dispensers

(This item was not adopted.)

Source: Southern Weights and Measures Association

Recommendation: Amend Section 3.3. Diesel Fuel by adding a new Section 3.3.3. Nozzle Requirements for Diesel Fuels, as presented below.

3.3.3. Nozzle Requirements for Diesel. - <u>Within 12 months of the effective date of this section,</u> each dispensing device from which 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 inch.)

Discussion: This requirement will prevent consumers from inadvertently filling their vehicle gasoline tank with diesel fuel. The American Automobile Manufacturer's Association (AAMA) reported that the recommended fill pipe diameter is compatible with current diesel powered vehicles and those on the drawing board for the future. The AAMA and several jurisdictions expressed support for this item at the Interim Meeting.

At the Annual Meeting the Committee received comments indicating that this requirement may be widely supported if amended to permit industry time to replace diesel dispenser nozzles as they wear out or are broken. The Committee agreed that implementing the requirement over a year would give the industry the opportunity to replace existing equipment on a routine basis and thus reduce the economic impact of the requirement. Hence, it revised its original recommendation by adding a provision to allow the industry 1 year from the effective date of the requirement to install the larger nozzle required by the proposed regulation but the item was not adopted. The revised proposal is presented above; if it had been adopted to go into effect on January 1, 1998, would have allowed industry until January 1, 1999, to install the required nozzles.

237-3 V 3.2.5. Prohibition of Terms

(This item was adopted.)

Source: Southern Weights and Measures Association

Recommendation: Amend §3.2.5. by adding the term "Economy" and a reference to 86 octane product to clarify that sales of this fuel are permitted under the requirements specified in Table 1.

Table 1. Minimum Antiknock Index Requirements		
Terms	**ASTM D 4814 Altitude Reduction Areas IV and V**	**All Other ASTM D 4814 Areas**
Premium, Super, Supreme, High Test	90	91
Midgrade, Plus	87	89
Regular Leaded	86	88
Regular, Unleaded (alone)	85	87
Economy	-	**86**

Discussion: This amendment would recognize and allow for the term "Economy" to be used to describe gasoline or gasoline oxygenate blends with an antiknock index of 86. The Committee recommends adoption of this proposal. At the Annual Meeting comments were received which expressed concern over the addition of the term "Economy" but motions to amend the term to "Low Grade" or similar words were defeated.

250 NIST Handbook 133 "Checking the Net Contents of Packaged Goods"

250-1 I Status of NIST Handbook 133

Background: This was Item 240-2 in the Report of the 78th NCWM, 1993, (page 236) and Item 250-1 in the Report of the 79th NCWM, 1994 (page 222). In the NCWM's petition to the Food and Drug Administration (FDA) on November 9, 1992, States requested an exemption from preemption under Section 403 A(b) of the Federal Food, Drug, and Cosmetic Act to permit continued use of NIST Handbook 133, "Checking the Net Contents of Packaged Goods," for testing foods for the accuracy of their quantity declarations. Extensive revisions were made to the handbook at the 79th NCWM Annual Meeting, and were published in November 1994 in a 4th supplement to the handbook. The Office of Weights and Measures has provided several successful training classes on the 4th supplement since its adoption, and its acceptance and implementation are already underway in many States.

On March 4, 1997, FDA published its proposal to adopt NIST Handbook 133 in the Federal Register. The proposal begins at page 9825 in Volume 62 No. 42 of the Register. This is the result of almost 5 years of work with that agency and will result in a national standard for testing the net contents of packaged goods based on NIST Handbook 133. FDA is proposing to revise its human and animal food labeling regulations that pertain to declarations of net quantity of contents on food packages. This action would establish specific procedures for checking conformance to net contents labeling requirements nationwide, and provide consumers with information that accurately reflects the actual contents of the package. These procedures include analytical methods for evaluating declarations in terms of mass or weight, volume, and count. FDA is also proposing to require that food packed in a pressurized container bear a declaration of the net mass or weight of the contents expelled when the instructions for use are followed (the NCWM petitioned FDA to adopt this method of sale in 1979), and to clarify when net content declarations expressed in terms of mass or weight are to be based on the contents without the packing medium (i.e., drained weight). Further, the agency is proposing to revise the standard of identity for fresh oysters to incorporate the NCWM limit of 15 percent free liquid.

250-2 NIST Handbook 133 Working Group Proposals

The NIST Handbook 133 Working Group (Working Group) developed guidelines assist officials and industry in conducting point of pack inspections and in developing an administrative review process. The Committee distributed these as information items for review at the regional meetings. Based on the comments received from the regional associations and at the Interim Meeting the Committee recommended adoption of the items for inclusion in the Interpretations and Guidelines section of NIST Handbook 130.

250-2A VC Good Quantity Control Practices

(This item was adopted as part of the consent calendar.)

Recommendation: Adopt the Good Quantity Control Practices and add to the Interpretations and Guidelines section of NIST Handbook 130.

Discussion: In Section 12.1.1. of the UPR, variations from declared net quantity are permitted when caused by unavoidable deviations in weighing, measuring, or counting the contents of individual packages that occur in current good manufacturing practice. Up to now the term "good" has not been defined. In Appendix B, the Committee is presenting guidelines that will help weights and measures officials and industry define what procedures constitute "good" manufacturing practices related to net quantity. These guidelines will clarify that "variations" from the declared net quantity of contents are only permitted in circumstances where the packer has "good" quantity control practices.

250-2B VC Point-of-Pack Inspection Guidelines

(This item was adopted as part of the consent calendar.)

Recommendation: Adopt the Point-of-Pack Inspection Guidelines presented in Appendix C and add to the Interpretations and Guidelines section of NIST Handbook 130.

Discussion: The Working Group explored the potential benefits of conducting net quantity of contents inspections at the point-of-pack. Several jurisdictions have requested guidance on how to conduct this type of inspection. In response to these requests the Working Group developed the outline presented in Appendix C. The outline provides guidance in opening, conducting, and closing inspections and includes tips on how to conduct a thorough inspection. Recommended procedures for plant personnel are also provided. The Committee supports the Working Group's goal of increasing the use of point-of-pack inspections to improve the effectiveness of net quantity of contents enforcement and recommends NCWM adoption of the guidelines.

250-2C VC Model Guidelines for Administrative Review Process

(This item was adopted as part of the consent calendar.)

Recommendation: Adopt the Model Guidelines for Administrative Review Process presented in Appendix D and add them to the Interpretations and Guidelines section of NIST Handbook 130.

Discussion: Officials often take enforcement actions to prohibit the use of devices or sale of packaged goods (e.g., "stop-sale" or "off-sale" orders for packages and "stop-use" or "condemnation" tags issued on devices.) Improper actions, (e.g., not following test procedures, misapplying labeling requirements, or incorrectly citing someone for a "violation") place the official, or the jurisdiction in the position of being liable for the action if it results in lost business, or if it is found that the action was "illegal." In some cases, a jurisdiction could be ordered to pay monetary damages to compensate the affected party for the improper action. Recognizing these concerns, the Working Group developed an outline of an administrative review procedure that is intended to ensure that persons affected by certain "inspection findings" (e.g., price misrepresentations or shortweight packages), or who are deprived of the use of their property (devices or packages placed under "stop" or "off-sale" order), have access to a timely independent review of the action. The guidelines are based on New York State procedures that were implemented in 1990 following settlement of a case regarding "due process" in the U.S. District Court of New York. The guidelines will assist affected persons in providing information that could be relevant in determining whether the action was proper and ensure that their ability to conduct business is not hindered by improper enforcement actions. These guidelines are provided to help jurisdictions develop their own administrative procedures and are intended for use independently of any other action (e.g., administrative penalty actions) that may be taken by an enforcement agency. The Committee made several editorial revisions to this guideline in response to the comments received during the public hearing at the Annual Meeting. These revisions are presented in Appendix D.

250-3 I Moisture Loss for Pasta and Rice

The Committee is delaying action on these items until the Food and Drug Administration (FDA) issues a final regulation regarding net quantity of contents testing. See Item 250-1 for details on FDA's proposal to adopt NIST Handbook 133.

Background for Pasta: See Item 240-5 in the Report of the 75th NCWM, 1990 (page 107); Item 240-4 in the Report of the 76th NCWM, 1991 (page 219); Item 240-4 in the Report of the 77th NCWM, 1992 (page 154); Item 240-3 in the Report of the 78th NCWM, 1993 (page 237); and Item 250-2 in the Report of the 79th NCWM, 1994, (page 225) for background. A field study protocol has been developed by the National Pasta Association (NPA) for nationwide study to determine the moisture losses on various pasta products in different packaging materials. The study will be used to develop a gray area proposal for pasta products which lose moisture to the atmosphere.

Background for Rice: This was Item 240-7 in the Report of the 76th NCWM, 1991, (pages 221-222); Item 240-5 in the Report of the 77th NCWM, 1992 (page 154); and Item 250-3 in the Report of the 79th NCWM, 1994 (page 225). The U.S.A. Rice Federation (Federation) has requested that the Conference address the moisture loss of packaged rice in a manner similar to that used for flour, namely, to establish a gray area for packaged rice. A field study protocol has been developed by the Federation for a nationwide study to determine the moisture losses of various rices in different packaging materials.

250-4 I Moisture Loss for Meat and Poultry Products

Background: See Item 240-7 on page 239 in the Report of the 78th NCWM for background on this issue. The Committee will develop a workplan to implement studies on ice packed poultry for the spring of 1997. The Committee would like to recruit someone to coordinate one or more of these projects. Persons interested in participating in these studies should contact the Committee's Technical Advisor. The Committee decided to provide support and resources to develop a gray area for ice-packed poultry since this commodity continues to be the subject of complaints about underweights from small retailers. The Committee will consider work in the other categories when resources permit.

1. Ice-packed bulk poultry
2. Raw meat products (chopped beef, ground beef, hamburger, and beef patties)
3. Cured pork products (hams, shoulders, and loins)
4. Cured beef products (corned beef, corned beef brisket, and tongues)
5. Ham patties, chopped ham, pressed ham, and similar products
6. Dry salami and other meat or poultry products that lose moisture to the atmosphere

250-5 I Maximum Allowable Variations for Count Declarations on Seed

This issue relates to the values of the Maximum Allowable Variations (MAVs) appropriate for count declarations on packages of agricultural seed. The Committee has assigned this issue to the NIST Handbook 133 Working Group. The Working Group will cooperate with industry, trade associations, and other interested parties to develop a proposal for consideration by the NCWM at the appropriate time. The American Seed Trade Association (ASTA) has established a work group comprised of industry and government representatives to study this issue so that recommendations can be developed for consideration at the 1998 Interim Meeting. At the Annual Meeting, Leslie Cahill, Vice President, Government Affairs, of the ASTA updated the Committee on the association's work with the United States Department of Agriculture to develop data to justify a revision to the MAVs for items that include a declaration of count. The ASTA work is focusing on standardizing the procedures used to insure the accuracy of electronic seed counters, and on developing uniform operational procedures for their use. Another issue is the need to identify the impact of moisture loss on the accuracy of seed counts. The Committee received additional comments on this item regarding current NIST Handbook 133 test procedures for items labeled by count and the use of supplementary declarations of count from the Central Weights and Measures Association. These questions will be considered at the 1998 Interim Meeting.

250-6 I Liquefied Petroleum Gas (LPG) Packaged in Cylinders

Background: The National Propane Gas Association (NPGA) made a presentation during the Interim Meeting concerning the national implementation of new regulations and standards for small cylinders (i.e., those with a water capacity of between 4 and 40 pounds) used to deliver packaged LPG to consumers. The new safety regulations require that more than 60 million small LPG cylinders currently in use be modified to include a new Overfill Prevention Device (OPD) by 2002. These new

OPDs prevent cylinders from being filled to more than 80 percent of capacity. The purpose of the requirement is to ensure that cylinders have room for product expansion if temperature increase. In most areas of the country the OPDs will restrict packers to filling a "20-pound" cylinder with no more than 18 pounds of LPG for home use, such as for barbecue grills, heating units, and recreational vehicles. However, when ambient temperatures are moderate, packers can put more than 18 pounds of LPG in the cylinder while in higher temperatures not more than 18 pounds can be put into cylinders. The actual amount of LPG any container will hold will vary, so sellers must inform consumers about the net quantity of contents of the cylinders they sell. The Committee does not believe any changes are needed to NIST Handbook 130 or to Handbook 133. The Committee agreed to work with the NPGA to develop an educational effort to help to disseminate information on the new safety device and how its implementation will affect the display of net weight declarations in sales of propane cylinders.

250-7 I Test Procedure for Verifying the Basis Weight of Communication Paper

Source: Western Weights and Measures Association

Discussion: In response to complaints from paper converters (firms which convert bulk paper into smaller sizes and forms), officials in the Western Weights and Measures Association (WWMA) have been verifying the identity and net quantity statements on a wide variety of paper. According to the WWMA inspectors have found that some converters, in an effort to gain a competitive advantage, have resorted to misrepresenting the basis weight of paper. In 1994, NCWM adopted a method of sale for packaged paper that requires that converters declare a basis weight that corresponds to the basis weight declared by the original paper manufacturer. When it adopted the method of sale the NCWM recommended that officials work with industry to develop a test method for use in verifying the declared basis weight for all types of paper (see item 232-6, page 217 in the Report of the 79th NCWM, 1994) Officials from Los Angeles County and the State of California worked with representatives of the paper industry to develop a gravimetric testing procedure. Unlike other test procedures the NCWM has considered, this procedure is not to be used for verifying the net quantity of contents of packaged paper which is labeled with dimensions (e.g., length and width) and count. Rather, the procedure is for use in verifying that the basis weight included in a statement of identity is not misleading or deceptive. The Committee would like to point out that the procedure is for field surveillance work. It is not intended to be used as the final criterion on which enforcement action is taken. Instead, the test procedure is only used to identify potentially violative lots. There are two alternative actions that can be taken if the test results indicate that a lot is potentially violative. The first is to review the documentation supplied by the original manufacturer to the converter to determine if any misrepresentation has occurred. The second is to collect samples of the paper and test them according to the latest version of American Society of Testing and Materials Standard Method D 646 for "Grammage of Paper and Paperboard."

The Committee received comments on the proposal that indicated that the implications of this issue are not widely understood by NCWM members. While the Committee recognizes that only a few jurisdictions have entered into this new area of weight and measures enforcement, it is important that the NCWM support these jurisdictions in their efforts to develop test procedures and gain a base of experience in conducting investigations in new areas. The NCWM's assistance on this issue is especially important to these jurisdictions since they are responding to requests for assistance from both consumers and reputable converters, who find themselves at a competitive disadvantage when they bid on public and private paper purchasing contracts. The Committee is presenting the test procedure in Appendix E as an information item so it can be considered at the other regional association meetings. It is presented as an amendment to Chapter 5 in NIST Handbook 133. However; since the procedure is not used for net quantity determinations the Committee is reluctant to include it in NIST Handbook 133. Instead, the Committee is considering recommending that the test procedure be added to the Interpretations and Guidelines Section of NIST Handbook 130. The Committee requests comments on this suggestion. The Committee urges other jurisdictions to use the draft of the proposed test procedure, as presented in Appendix E to (1), determine if the procedure provides useful and accurate information, and (2) assess whether some converters in other regions of the country are not providing accurate declarations of basis weight. The definition of communication paper may be found in Handbook 130, page 97, Section 2.28. At the Annual Meeting an official of Los Angeles County Weights and Measures submitted a revised Table 1. Common Types of Paper to replace the one presented on page 157. The Committee supported the proposed revision and presents the revised table below. The Committee requests that jurisdictions volunteer to try out the procedures and submit comments and test results at the next Interim Meeting. Jurisdictions interested in using this test procedure can obtain information and assistance from Robert Atkins, Los Angeles County Weights and Measures at 562-940-8941.

260 Other Items

260-1 I Committee Policy and Procedures

Source Laws and Regulations Committee

Proposal: The Committee proposes to clarify the methods by which items may be placed on the agenda. Methods proposed include the following:

- Agenda items passed through a minimum of one regional;
- Committee chairman approval for items submitted by industry, OWM and other groups;
- Provisions for "emergency" NCWM action.

An additional proposal to improve the flow of information from the NCWM Laws and Regulations Committee to regional L&R committees (and vice versa) is to encourage the regional committees to place their NCWM committee representatives on the respective regional committees, either as regular members or as non-voting "ex officio" members.

Discussion: The Committee believes there is widespread confusion over the protocol that must be followed for placing items on the agenda. One of the main issues is whether items must be reported out of all of the regional meetings prior to placement on the agenda, or if action by one region is sufficient. The Committee feels that action by one regional association automatically qualifies an item for agenda placement. One reason for this is that issues submitted at the Southern Weights and Measures Association would be delayed an entire year if approval from more than one association were required. Another justification for the "one region" requirement is that there is no way to ensure that an item approved by the Western or other associations will be placed on the agenda of the Southern or any of the other regional meetings.

The Committee also feels that provisions for extra-regional action should be made to allow interim agenda access. These circumstances would include exercising the Committee Chairman's prerogative with regard to issues brought forward by industry associations, individual industry, the NIST Handbook 133 Working Group, the Petroleum Subcommittee, and the Office of Weights and Measures. The Committee feels that allowing the Chairman prudent discretion in placing items on the agenda outside the regional channels is appropriate and preserves the spirit of access to the conference. The Committee also believes that items from other standing committees, subcommittees, or NCWM working groups can be placed on the interim agenda at the discretion of the Committee Chairman. This allows for the consideration of "emergency" items not discussed at the regional level prior to the agenda-setting meeting. It is suggested that a "flow chart" on agenda procedures be adopted by the NCWM for use by all standing committees.

The Committee also recognized that there is often a communication gap between the workings of the NCWM Laws and Regulations Committee and the L&R Committees established at the regional level. This can result in misinterpretations of the NCWM L&R Committee's positions and incomplete or late regional reports. This results in the region missing the cutoff for agenda consideration at the NCWM Interim Meeting. The Committee feels that this problem could largely be eliminated by ensuring that the regional NCWM L&R member be maintained on the regional committee itself. This member could be voting or non-voting (ex officio), with the idea that the national committee representative could effectively represent the national committee's positions and, in turn, communicate the regional concerns back to the national committee.

Guidelines for Submitting Proposed Amendments to the Laws and Regulations Committee

The Committee has updated its guidelines for submitting proposed amendments for consideration at the Interim Meetings and is presenting them in their entirety for the information of the membership.

The NCWM Committee on Laws and Regulations provides the mechanism for consideration of amendments or additions to the Uniform Laws and Regulations. Recommendations for changes should be directed to the Committee on Laws and Regulations, National Conference on Weights and Measures, P.0. Box 4025, Gaithersburg, MD, 20885 (with a copy to the Executive Secretary at the same address). Recommendations and comments on agenda items can be submitted by E-mail through Ken Butcher, the Committee's Technical Advisor, at *kbutcher@nist.gov* or by Fax at 301-926-0647.

- Your proposal should address problems or issues that are national or regional in scope. Proposals should contain a concise statement of the problem and clearly outline the purpose and national or regional need for its consideration.

- Proposals should be accompanied by adequate background material, including test data, analysis of test data, or other appropriately researched and documented material. This material will allow the Committee to either make a suitable recommendation for NCWM action or consider the need for further study. When possible, solutions to problems should be proposed and stated in specific language and format in amendment form to Conference documents.

- To be considered by the Committee for action during the upcoming Conference, your proposal must be presented in writing to the Committee by November 1 prior to the Interim Meetings (in January of each year). Whenever possible, an electronic copy of the background material and proposed amendment(s) should be submitted on a 3.5 inch computer disk or via e-mail (OWM is currently using Wordperfect 7.0 for Windows 95. This program can convert most other word processing files for use so it is not necessary for you to only use Wordperfect.)

- NCWM members should utilize their regional associations for initial exploration of issues and to use the resources of all member States within that regional association to assist in the development of well documented proposals where applicable. Please note that proposals submitted directly to the Committee without regional association consideration may be carried over as information items on the Committee's Interim Report which may delay NCWM action on the issue for an additional year. In its consideration of any issue the Committee may decline to take action on a recommendation, make it an informational item and send it to a subcommittee or working group for study or send it to the regional associations for review.

- If a proposal involves a new field of weights and measures control, inspection, or activity, please make recommendations for both Uniform Regulations and test methods to provide for uniform enforcement.

Additionally, when a proposal that would modify or add to Handbook 130 is presented to the Committee, the proposal should:

- Identify the pertinent portion, section, and paragraph of the existing publication (e.g., Uniform Regulation for the Method of Sale of Commodities, § 2.8.).

- Where applicable, provide evidence of consistency with other portions of NCWM publications (such as with other Uniform Laws and Regulations).

- Where applicable, provide evidence of being identical to Federal laws and regulations (such as Food and Drug Administration, U. S. Department of Agriculture, or Federal Trade Commission regulations).

The Committee recommends that the Executive Committee use the policies and procedures presented in this item and by the Specification and Tolerances Committee to develop a single set of guidelines for submitting items for NCWM consideration.

S. Millay, Maine, Chairman

K. Angell, West Virginia
S. Morrison, San Luis Obispo County, California
M. Pinagel, Michigan
R. Williams, Tennessee

Industry Representative: Claire Regan, Grocery Manufacturers of America
NIST Handbook 133 Working Group: B. Bloch, California, Chairman
Petroleum Subcommittee: Randy Jennings, Tennessee, Chairman
Canadian Technical Advisor: G. Jorowski and J. Watters
NIST Technical Advisors: K. Butcher and T. Coleman

Committee on Laws and Regulations

Appendix A
Uniform Unit Pricing Regulation

Section 1. Application

Except for random and uniform weight packages that clearly state the unit price in accord with existing regulations, any retail establishment providing unit price information for packaged commodities, in addition to the total price, shall provide the unit price information in the manner prescribed herein.

Section 2. Terms for Unit Pricing

The declaration of the unit price of a particular commodity in all package sizes offered for sale in a retail establishment shall be uniformly and consistently expressed in terms of:

1. Price per kilogram or 100 grams, or price per pound or ounce if the net quantity of contents of the commodity is in terms of weight.

2. Price per liter or 100 milliliters, or price per dry quart or dry pint if the net quantity of contents of the commodity is in terms of dry measure or volume.

3. Price per liter or 100 milliliters, or price per gallon, quart, pint, or fluid ounce if the net quantity of contents of the commodity is in terms of liquid volume.

4. Price per individual unit or multiple units, if the net quantity of contents of the commodity is in terms of count.

5. Price per square meter, square decimeter, or square centimeter, or price per square yard, square foot, or square inch if the net quantity of contents of the commodity is in terms of area.

Section 3. Exemptions

1. Small Packages. - Commodities shall be exempt from these provisions when packaged in quantities of less than 28 g (1 ounce) or 29 ml (1 fluid ounce) or when the total retail price is 50 cents or less.

2. Single Items. - Commodities shall be exempt from these provisions when there is only one brand in only one size offered for sale in particular retail establishment.

3. Infant Formula. - For "infant formula" unit price information may be expressed based on the reconstituted volume. "Infant formula" means a food that is represented for special dietary use solely as a food for infants by reasons of its simulation of human milk or suitability as a complete or partial substitute for human milk.

4. Variety and Combination Packages. - Variety and Combination Packages as defined in §2.9 and §2.10 in the Uniform Packaging and LabelingRegulation[See Note 1)] shall be exempt from these provisions.

Note 1: See NIST Handbook 130 "Uniform Packaging and Labeling Regulation."

Section 4. Pricing

1. The unit price shall be to the nearest cent when a dollar or more.

2. If the unit price is under a dollar, it shall be listed:

a. to the tenth of a cent, or

b. to the whole cent.

c. the retail establishment shall have the option of using 2(a) or (b) but shall not implement both methods.

d. the retail establishment shall accurately and consistently use the same method of rounding up or down to compute the price to the whole cent.

Section 5. Presentation of Price

1. In any retail establishment in which the unit price information is provided in accordance with the provisions of this regulation, that information may be displayed by means of a sign that offers the unit price for one or more brands and/or sizes of a given commodity, by means of a sticker, stamp, sign, label, or tag affixed to the shelf upon which the commodity is displayed, or by means of a sticker, stamp, sign, able, or tag affixed to the consumer commodity.

2. Where a sign providing unit price information for one or more sizes or brands of a given commodity is used, that sign shall be clearly and in a nondeceptive manner in a central location as close as practical to all items to which the sign refers.

3. If a single sign or tag includes the unit price information for more than one brand or size of a given

commodity, then the following information shall be provided:

(a) The identity and the brand name of the commodity.

(b) The quantity of the packaged commodity if more than one package size per brand is displayed.

(c) The total retail sales price.

(d) The price per appropriate unit, in accordance with Section 2. Terms for Unit Pricing.

Section 6. Uniformity

1. If different brands or package sizes of the same consumer commodity are expressed in more than one unit of measure (e.g., soft drinks are offered for sale in 2 liter bottles and 12 fl. oz. cans), the retail establishment shall unit price the items consistently.

2. When metric units appear on the consumer commodity, in addition to the other units of measure, the retail establishment may include both units of measure on any stamps, tags, labels, signs, or lists.

Section 7. Effective Date

This regulation shall become effective on _____199_. Given under my hand and the seal of my office in the City of _____, on this ____ day of _____, 199_.

Appendix B
Good Quantity Control Practices

Good Quantity Control Practices means that the plant managers should take all reasonable precautions to ensure the following quantity control standards or their equivalent are met:

1. A formal quantity control function is in place with authority to review production processes and records, investigate possible errors, and approve, control, or reject lots.

2. Adequate facilities (e.g., equipment, standards and work areas) for conducting quantity control functions are provided and maintained.

3. A quantity control program (e.g., a system of statistical process control) is in place and maintained.

4. Sampling is conducted at a frequency appropriate to the product process to ensure that the data obtained is representative of the production lot.

5. Production records are maintained to provide a history of the filling and net content labeling of the product.

6. Each "production lot" contains on the average the labeled quantity and the number of packages exceeding the specified maximum allowable variation (MAV) value in the inspection sample shall be no more than permitted in Tables 2-1 and 2-2 in NIST Handbook 133.

7. Packaging practices are appropriate for specific products and measurement procedures (e.g., quantity sampling, density and tare determinations) and guidelines for recording and maintaining test results are documented.

8. Personnel responsible for quantity control follow written work instructions and are competent to perform their duties (e.g., background, education, experience and training). Training is conducted at sufficient intervals to ensure good practices.

9. Recognized procedures are used for the selection, maintenance, adjustment, and testing of filling equipment to insure proper fill control.

10. Weighing and measuring devices are suitable for their intended purpose and measurement standards are suitable and traceable to national standards. This includes a system of equipment maintenance and calibration to include recordkeeping procedures.

11. Controls over automated data systems and software used in quantity control ensures that information is accessible, but changeable only by authorized personnel.

12. Tare materials are monitored for variation. Label changes are controlled to ensure net quantity matches labeled declaration.

Appendix C
Point-of-Pack Inspection Guidelines

A. Weights and Measures Officials' Responsibilities

1. Conduct inspections during hours when the plant is normally open for business. Open the inspection by making contact with the plant manager or authorized representative (e.g., the quality assurance manager or the production manager.)

2. Present the proper credentials and explain the reason for the visit (e.g., routine or follow-up inspection or consumer complaint, etc.)

3. Request access to quantity measurement equipment in the packing room, moisture testing equipment in the laboratory or in the packing room, and to product packed on premise or stored in warehouse areas.

4. Obtain permission from a plant representative prior to using a tape recorder or camera.

5. Conduct inspection related activities in a professional and appropriate manner. If possible work in an area that will not interfere with normal activities of the establishment.

6. Abide by all the safety and sanitary requirements of the establishment, and clean the work area upon completion of the inspection/test. Return borrowed equipment and materials

7. To close the inspection, recheck inspection reports in detail and ascertain that all information is complete and correct.

8. Sample questions and tasks for Inspectors

a. Inside Buildings and Equipment

(i)Is all filling and associated equipment in good repair?

(ii) Are net content measurement devices suitable for the purpose being used?

(iii) Are standards traceable to NIST used by the firm to verify device accuracy?

b. Packing Room Inspection

(i) Observe if the program for net quantity of content control in the packing room is actually being carried out.

(ii) Ensure that the weighing systems are suitable and tare determination procedures are adequate. If there is any question regarding tare determination, weigh a representative number of tare and/or filled packages.

(iii) For products labeled and filled by volume and then checked by weight, ensure that proper density is used.

c. Warehouse Inspection

If an inspection is conducted:

(i) Select lot(s) to be evaluated.

(ii) Determine the number of samples to be inspected. Use the appropriate sampling plan as described in NIST Handbook 133.

(iii) Randomly select the number of samples or use a mutually agreed on plan for selecting the samples.

(iv) Determine the average net quantity of the sample and use the standard deviation factor to compute the Sample Error Limit (SEL) to evaluate the lot.

(v) Look for individual values that exceed the applicable Maximum Allowable Variation as found in NIST Handbook 133.

(vi) Apply moisture allowances, if applicable.

(vii) Review the general condition of the warehouse relevant to package integrity, good quantity control and distribution practices.

(viii) Prepare an inspection report to detail findings and actions.

9. Closing the Inspection - Review findings with Plant Representative.

After the inspection, meet with the management representative to discuss inspection findings and observations. Provide additional information as needed (e.g., information on laws and regulations or explanations of test procedures used in the inspection.) Be informative, courteous and responsive. If problems/violations are found during the inspection/test, bring them to the attention of the appropriate person.

B. Plant Management Responsibilities

1. Recognize that inspectors are enforcing a Federal, State or Local law.

2. Assist the official in conducting inspection activities in a timely and efficient manner.

3. During the initial conference with the inspector, find out whether the inspection is routine or if is the result of a consumer complaint. If it is for a complaint, obtain as much information as possible concerning the nature of the complaint so that the firm can respond appropriately.

4. The plant manager, quality assurance manager, or any designated representative should accompany the inspector.

5. Plant personnel should take note of the inspectors comments during the inspection and prepare a detailed writeup as soon as the inspection is completed.

6. When an official presents an inspection report, discuss the observations and if possible provide explanations for any changes deemed necessary as a result of the inspection/test.

Plant Management: information that must be shared with the Inspector.

1. Establishment name and address.

2. Type of firm and information on related firms or applicable information (e.g., sub contractor, servant or agent.)

3. General description and location of shipping and storage areas where packaged goods intended for distribution are stored.

4. Commodities manufactured by or stored at the facility.

5. Names of responsible plant officials.

Plant Management: information that may be shared with the Inspector.

1. Simple flow sheet of the filling process with appropriate net content control checkpoints.

2. Weighing or measuring device maintenance and calibration test records.

3. Type of quantity control tests and methods used.

4. Net content control charts for any lot, shipment, or delivery in question or lots which have previously been cited.

5. Method of date coding the product to include code interpretation.

6. Laboratory reports showing the moisture analysis of the products which are in question or have been previously cited.

7. Product volume of lot sizes or related information.

8. Distribution records related to a problem lots including names of customers.

Appendix D
Model Guidelines for the Administrative Review ~~Due~~ Process ~~Procedures~~

A. Purpose.- These guidelines are provided for weights and measures programs who choose to establish an administrative review process. They are not intended to be the only process an agency may use. Nor are they intended to supersede any jurisdiction's existing process. Prior to implementing ANY process legal counsel should be consulted.

These guidelines ensure that persons affected by "inspection findings" (e.g., price misrepresentations or shortweight packages), or who are deprived of the use of their property (devices or packages placed under "stop" or "off-sale" order), are provided a timely-independent review of the action. The administrative review process enables affected persons to provide evidence which could be relevant in determining whether an enforcement action was proper. The purpose of the process is to ensure that a person's ability to conduct business is not hindered by improper enforcement actions. This process is independent of any other action (e.g., administrative penalties, prosecutions, etc. ~~actions~~) that may be taken by the enforcement agency.

B. Background.- In the course of their work, weights and measures officials take enforcement actions that may prohibit the use of devices or the sale of packaged goods (e.g., "stop-sale" or "off-sale" orders for packages and "stop-use" or "condemnation" tags issued on devices). Improper actions, (e.g., not following prescribed test procedures, enforcing labeling requirements on exempted packages, or incorrectly citing someone for a "violation") place the official, and the jurisdiction in the position of being liable for the action if it is found that the action was "illegal." In some cases, weights and measures jurisdictions could be ordered to pay monetary damages to compensate the affected party for the improper action.

This process is one way to provide affected persons an opportunity to present evidence which may be relevant in determining whether the order or finding has been properly made to an independent party. The procedure enables business operators to obtain an independent review of orders or findings so that actions affecting their business can be evaluated administratively instead of through litigation. This ensures timely review, which is essential because of the impact that such actions may have on the ability of a business to operate, and in cases where perishable products may be lost.

C. ~~Due Process~~ Review Provisions. - Parties affected by enforcement actions must be given the opportunity to appeal enforcement actions.

- Inspectors make primary contact with firms and are in the best position to ensure the enforcement actions are "proper." "Proper" means that inspections are conducted (1) within the scope of the authority granted by law, (2) according to recognized investigative or testing procedures and standards, and (3) that enforcement actions are lawful. The "burden" for proving that actions are "proper" falls on the weights and measures program, not on regulated firms.

- Weights and measures officials are law enforcement officers. Therefore, they have the responsibility to exercise their authority within the "due process" provisions of the U.S. Constitution. As weights and measure programs carry-out their enforcement responsibilities in the future, more and more challenges to their actions and authority will occur. It is in the best interest of any program to establish strict operational procedures and standards of conduct to prevent the occurrence of improper actions which may place the jurisdiction in an untenable position in a court challenge of an enforcement action. The foundation for ensuring "proper" actions is training, clear and concise requirements, and adoption of and ~~strict~~ adherence to uniform test procedures and legal procedures.

- Prior to taking enforcement actions the inspector should recheck test results and determine that the information on which the action will be taken is accurate.

- Inspections shall be conducted with the understanding that the findings will be clearly and plainly documented and reviewed with the store's representative.

- During the review the firm's representative may provide information to the inspector which may resolve any issues or concerns before enforcement action is taken. In some cases, relevant information may be provided which may not persuade the inspector to forego action. In other cases business representative may not understand the circumstances surrounding the violations, or there may be a conflict between the parties that they cannot resolve. In other cases, the owner, or manufacturer may learn that an enforcement action has occurred after the inspector has left the establishment.

Steps:

1. Provide a framework that will help in resolving most of these situations where "due process" is of concern. Make sure that the responsible party (e.g., as declared on the package label) is notified of violations and receives copies of inspection reports. Establish standard operating procedures to assure the affected party of timely access to a representative of the weights and measures program so that the firm can provide the relevant information or obtain clarification of legal requirements.

2. Make the process as simple and convenient as possible. Especially in distant or rural areas where there are no local offices, the review should be conducted by a supervisor of the official taking the action if agreed to by the person filing the request for review.

3. The process should include notice that the firm can seek review at a higher level in the weights and measures program or an independent review by a third party. The following procedures are recommended:

- Any owner, distributor, packager, or retailer of a device ordered out of service, or item or commodity ordered "off-sale," or inspection finding (e.g., a price misrepresentation or a shortweight lot of packages) shall be entitled to a timely ~~within three (3) business days of the date of receipt of a written request for~~ review of such order, to a prompt, impartial, administrative review of such off-sale order or finding.

~~The following~~ A notice of the right to administrative review should be included on all orders or reports of findings or violations and should be communicated to ~~both~~ the ~~retailer~~ responsible firm (e.g., person or firm identified on the product label):

Sample Notice

You have the right to Administrative Review of this order or finding. To obtain a review, contact the Director of Weights and Measures by telephone or send a written request (either postmarked, faxed, or hand delivered) to:

(Name, Address or Fax Number of the Director or other Designated Official)

Your request should reference any information that you believe supports the withdrawal or modification of the order or finding.

-The administrative review shall be conducted by an independent party designated by the Director or before an independent hearing officer appointed by the Department. The officer shall not be a person responsible for weights and measures administration or enforcement.

- No fees should be imposed for the administrative review process.

- The firm responsible for the product or the retailer may introduce any record or other relevant evidence. ~~including, but not limited.~~ For example:

(i) Commodities subject to the off-sale action or other findings were produced, processed, packaged, priced, or labeled in accordance with applicable laws, regulations or requirements.

(ii) Devices subject to the "stop-use" order or "condemnation" were maintained in accordance with applicable laws, regulations or requirements.

(iii) Prescribed test procedures or sampling plans were not followed by the inspector.

(iv) Mitigating circumstances existed which should be considered.

- The reviewer must consider the inspector's report, findings, and actions as well as any evidence introduced by the owner, distributer, packager, or retailer as part of the review process.

- The reviewer must provide a timely written recommendation ~~within five business days of the~~ following review unless additional time is agreed to by the department and the petitioner.

- The reviewer may recommend to the Department that an order be upheld, withdrawn or modified. If justified, the reviewer may recommend other action including a reinspection of the device or commodity based upon information presented during the review.

- All actions should be documented and all parties advised in writing of the results of the review. The report of action should be detailed in that it provides the reasons for the decision.

Appendix E
Basis Weight Test Procedure for Communication and Other Paper

5.8. Test Procedure for Verifying the Basis Weight of Communication Paper

5.8.1. Equipment

• Linear measure as recommended in Section 5.3.1. Equipment.

• Scale with a minimum division of 0.5 g (0.001 lb) or less.

• Scientific calculator with a sample standard deviation function ($\sigma n-1$) key.

5.8.2. Scope and Recommended Enforcement Approach. - Paper is manufactured in various basis weights for use in different applications (e.g., copy paper can have a basis weight of 18 or 20 lbs.) Basis weight is part of the product identity and not a declaration of net contents. This procedure is used to verify the basis weight declared on package labels. If the tested packages in a sample do not have an average basis weight equal to or greater than the labeled basis weight, the inspection lot may be violative. A potentially violative lot should be placed "off-sale" until the owner provides documentation to confirm that the labeled basis weight corresponds to the basis weight declared by the original manufacturer. If documentation is not provided, the inspection lot should remain "off-sale" until the basis weight declaration is corrected.

5.8.3. Basis Weight. - The basis weight of paper is the designated fixed weight (measured in grams or pounds per specified area) of one ream in basic sheet size from which the paper was made. This permits the confirmation of basis weight by linear measurement and gravimetric testing. This procedure is designed to test the various types, size, count, and basis weights of packaged paper currently in the marketplace. Table 1 lists the basic size for common types of paper. A "ream" is 500 sheets of basic size paper, but a ream of tissue paper is 480 sheets. Each of the categories of paper products shown in Table 1 has a different standard size for an individual sheet of paper, hence a different square area. If the paper product of concern does not appear in Table 1, refer to Section 5.8.4.2. Although there are basic sizes, paper is packaged, and marketed in various sizes and counts. The net weight of packaged paper can be determined from the label information using the General Formula for Sheet Paper. For roll paper, use one (1) for the sheet count.

General Formula for Sheet Paper

$$\frac{PA \times BW}{BSS} \times \frac{SC}{500} = TNW$$

Where:

PA = area of one sheet of paper
BW = labeled basis weight
BSS = area of basis sheet size from Table 1.
SC = package sheet count
TNW = target net weight of paper

5.8.4. Test Procedure. - The following gravimetric, measuring, and counting procedures shall be used to determine if packages are accurately labeled. Procedures are also provided for verifying net quantity of content declarations for count and dimensions (e.g., length and width.)

5.8.4.1. Sample Selection. - Select a sample from an inspection lot using Table 2-1 Sampling Plans of Category A (page B-2.) Determine an average tare weight in accordance with 4. Tare Procedures in Section 3 Core Method for Checking the Net Contents of Packaged Goods in the 4th Supplement.

5.8.4.2 Determine Net Weight of Non-Basic Size Paper.-Verify the basis weight declared on a package using the following gravimetric procedure:

a. Record the following information from the package label on a worksheet (See Figure 1 for a sample label.)

1. Type of Paper (TP)
2. Length (L)
3. Width (W)
4. Package Sheet Count (PSC)
5. Basis Weight (BW)
6. Basis Size Sheet (BSS)

Example

White Copy Paper
75 g/m² (20 lb) Bond

Size: 216 mm x 279 mm (8½ in x 11 in)

Basis Size: 43.1 cm x 55.8 cm (17 in x 22 in)

Count: 500 sheets

Figure 1. Sample Label

b. Compute the Target Net Weight (TNW) for the sample packages using the General Formula for Sheet Paper.

Basis Weight Worksheet (see Figure 1)

Type of Paper (TP):	*Copy Paper*
Length (L):	*11 in*
Width (W):	*8½ in*
Area of Sheet (LxW):	*93.5 in²*
Package Sheet Count (PSC):	*500*
Basis Weight (BW):	*20 lb*
Basis Size Sheet (BSS):	*17 in x 22 in*
Area for BSS from Table 1:	*374 in²*

Use the General Formula to compute Target Net Weight (TNW):

$$\frac{93.5 \times 20}{374} \times \frac{500}{500} = 5 \text{ lb}$$

Target Net Weight (TNW) = 5 lb

c. Determine the average net weight of the sample packages (do not use sample error limit calculations.) If the average net weight is not equal to or more than the Target Net Weight go to Section 5.8.4.3. to determine if the labeled basis weight (BW) is correct. If the average net weight is equal to or more than the labeled basis weight the sample passes.

5.8.4.3. Determine Basis Weight. - This procedure is used to identify potentially violative packages. If the Average Basis Weight (ABW) for the sample determined by this procedure is not equal to or greater than the labeled basis weight other steps must be taken. Moisture affects the weight of paper but the moisture content of paper only be determined in a measurement laboratory according to American Society of Testing and Materials D 646 - 95, "Standard Test Method for Grammage of Paper and Paperboard (Weight Per Area Unit)."

a. Verify basis weight according to the following steps:

i. Identify the paper type from Column 1 in Table 1 and record the area for the paper type from Column 3.

ii. Select a sample of paper from each of the tare sample packages. Use a sample of exact count to eliminate the possibility that the packages are short count.

- For packages with sheet count of 500 or more, use 100 sheets.

- For packages with less than 500 sheets, use 20 percent of label sheet count.

iii. Use a basis weight work sheet and determine the number of basic size sheets the paper sample represents with the following formula:

$$\frac{AREA}{A} \times EC = ENBSS$$

Where:

A = area of basic sheet size from Table 1
AREA = area (l x w) of one sheet of paper
EC = exact sheet count of sample
ENBSS = equivalent number of basis size sheets

iv. Determine the actual basis weight:

$$\frac{NW \times RC}{ENBSS} = BW$$

Where:

ABW = basis weight
ENBSS = equivalent number of basis size sheets from step iii.
NW = net weight of sample
RC = Ream Count (500; for tissue paper use 480)

Table 1. Common Types of Paper	
Paper Type	**Area Square Units**
Bond, Ledger, Thin, and Writing	2412 cm (374 in)
Manuscript Cover	3599 cm (558 in)
Blotting	2941 cm (456 in)
Cover	3354 cm (520 in)
Blanks	3974 cm (616 in)
Printing Bristols	4135 cm (641 in)
Wrapping, Tissue, Waxed, Newsprint and Tag Stock	5574 cm (864 in)
Book, Offset, and Text	6129 cm (950 in)
Index Bristol	5019 cm (778 in)

v. Repeat this step for each paper sample and average the basis weights from each package to obtain an Average Basis Weight (ABW.) If the ABW is less than the labeled basis weight or if the difference between the basis weight of the sample packages is more than 1 scale division, take a sample of paper from each of the remaining and follow step a.

vi. Weigh each sub-sample. If the basis weight from step iv is different from the labeled basis weight, re-calculate the target net weight using the general formula for sheet paper using the BW computed for the sample packages in steps iii and iv.

vii. Use the target net weight computed in viii and re-weigh the inspection samples using Section 3. Core Method for Checking the Net Contents of Packaged Goods. If inspection sample weights differ from the target net weight computed using the basis weight determined in viii, it is likely the label sheet count is inaccurate.

b. Confirm the label sheet count. Count the number of sheets in each package or determine conformance using the gravimetric procedure in Section 5.1.3. of Handbook 133.

c. Verify dimensions (length x width) on paper from each package of the sample. If actual measurements do not meet label claims, follow steps 4 through 12 of Section 5.3.2. of Handbook 133 to determine conformance.

5.8.4.3.1. Other Types of Paper

1. Roll Paper.- When testing rolled paper cut a length off the roll equal to 9,350 divided by the width. For example, {9350 in/8.5 in = 813.043 inches). Make sure the ends of this length of paper are square. Proceed to section 5.8.4.3 step a. Disregard the exact sheet count in step iii.

2. Continuous Track Feed Printer Paper:

i. Count out a sample of 100 sheets from each tare sample package of the inspection lot.

ii. Weigh each 100 sheet sample and record the weights.

iii. Calculate an average weight.

iv. Remove printer tractor feed strips.

v. Re-weigh sample and record the weights.

vi. Calculate an average weight.

vii. Calculate percentage (%) difference in average weights.

viii. Subtract the average weight in step ii. from the average weight in step vi.

ix. Divide the difference by average weight in step i.

x. Using the samples after the track segments have been removed, verify the basis weight for the packages of the inspection lot using the formulas in 5.8.4.2. If the basis weight differs from the label basis weight, go to step c.viii.

xi. Increase the re-calculated weight of the General Formula by the percentage (%) in step viii.

xii. Go to step C(ix).

Report of the Committee on Specifications and Tolerances

Ronald D. Murdock, Chairman
Measurement Section Standards Division
North Carolina

Introduction

This is the Final Report of the Committee on Specifications and Tolerances for the 82nd Annual Meeting of the National Conference on Weights and Measures (NCWM). This report is based on the Interim Report offered in the Conference "Program and Committee Reports" (NCWM Publication 16), the Addendum Sheets issued at the Annual Meeting, and actions taken by the membership at the Voting Session of the Annual Meeting.

Table A identifies the items in the Report by Reference Key Number, Item Title, and Page Number. The item numbers are those assigned in the Interim Meeting Agenda. Voting items are indicated with a "**V**" after the item number. Consent calendar items are marked with a "**VC**." Items marked with an "**I**" after the reference key number are information items. The items marked with a "**W**" were withdrawn by the Committee. Items marked with a "**W**" generally will be referred back to the regional weights and measures associations because they either need additional development, analysis, and input, or did not have sufficient support of the Committee to bring them before the NCWM.

The attached Report contains many recommendations to revise or amend National Institute of Standards and Technology (NIST) Handbook 44, 1998 Edition, "Specifications, Tolerances, and other Technical Requirements for Weighing and Measuring Devices." Proposed revisions to the handbook are shown in **bold face print** by ~~crossing out~~ what is to be deleted, and underlining what is to be added. Requirements that are proposed to be nonretroactive are printed in *italics*. Entirely new paragraphs or sections proposed for addition to the handbook are designated as such and shown in **bold face print**.

Note: The policy of the National Institute of Standards and Technology is to use metric units of measurement in all of its publications; however, recommendations received by the NCWM technical committees have been printed in this publication as they were submitted and may therefore contain references to inch-pound units.

Agenda Items

Agenda Items (Continued)

Agenda Items (Continued)

Table C
Voting Results

Reference Key No.	House of State Representatives		House of Delegates		Results
	Yes	No	Yes	No	
300 (Consent Calendar)	40	0	51	0	Passed
320-2	42	0	60	0	Passed
330-1	39	1	58	0	Passed
332-4	30	8	33	23	Passed
Report in its Entirety	42	0	64	0	Passed

Details of All Items

General Code

310-1 I G-S.1. Identification and Appendix D, Definitions; for Manufactured and Remanufactured Devices

Source: Central Weights and Measures Association

Discussion: In response to the Committee's request for language to describe remanufactured equipment applications, industry representatives presented the following language during the Annual Meeting.

The Gasoline Pump Manufacturers Association (GPMA), working closely with equipment remanufacturers, proposed the following new paragraph for inclusion in the Liquid-Measuring Device Code:

> S.4.5. Additional Labeling for Retail Motor Fuel Dispensers. Any retail motor fuel dispenser other than new, when resold for placement into service, must be marked (name, address, phone number) to identify the source.
> [Nonretroactive as of January 1, 199X]

The Scale Manufacturers Association (SMA) proposed the following definitions for Remanufactured Device, Reconditioned Device, and Repaired Device be added to the Scales Code to aid the National Conference on Weights and Measures (NCWM) in its discussions and to further clarify the issues.

> Remanufactured Device. A device which had been returned to a like new operating condition by the original equipment manufacturer or manufacturer's agent.
>
> Reconditioned Device. A device which has been returned to operating condition by other than the original manufacturer or manufacturer's agent by use of the original equipment manufacturer's approved components.
>
> Repaired Device. A device which has been returned to operating condition after having undergone metrologically significant repair.

The SMA notes that similar efforts should be made to ensure that uniform definitions are eventually incorporated into other related publications, such as, NIST Handbook 130 and NCWM Publication 14.

The Committee encourages the associate membership to continue to work to reach a consensus on appropriate language which describes labeling requirements for non-original manufacturer equipment.

Background: During the 1997 Interim Meeting, a special meeting was held in conjunction with the Committee's Agenda Review session to allow for additional comments from interested parties on the subject of remanufactured equipment and to give further consideration to the following proposal:

> G-S.1. Identification.
>
> (e) Remanufacturer: In addition to the markings required in paragraphs (a) through (d), a device that has been substantially altered, remanufactured or removed from the location must be labeled with the "Remanufacturer's" name or logo and month and year of remanufacture.
> (Added 1997)

Modify the definition for "manufactured device" and add a definition for remanufactured device to Handbook 44 Appendix D as follows:

> manufactured device. Any new device ~~or any other device that has been removed from service and substantially altered or rebuilt~~ as shipped from the original manufacturer.[1.10]

remanufactured device. Any device that has been substantially altered, remanufactured or removed from the location.

Based on input at the special meeting and other comments, the Committee decided to make the item informational to allow additional time for industry to resolve differences on the proposed language. It was noted that the Committee is also allowing additional time so that language may be developed and submitted to the regional weights and measures associations for study, because the Committee is intent on moving this forward as a voting item in 1998. The Committee also asked that the new language should contain specific examples of how this requirement applies and what effect these changes have on the Certificate of Conformance issued to a device. During the special meeting, participants with similar views were encouraged to present their positions jointly. Comments were heard from George Anderson (DurEquip), Mike Futral and Rod Smith (Tronitec, Incorporated), Dan Graff (Graffco, Incorporated), Doug and Rick Long (RDM Electronics), Gordon Johnson (GPMA), Tom McGee (PMP Corporation), Mark Morgan (Petroleum Transportation and Storage Association), Dave Quinn (Fairbanks), Paul Peterson (USDA-GIPSA), Bob Traettino (Meter Manufacturers Association), and Daryl Tonini (Scale Manufacturers Association). At the conclusion of the Interim Meeting, the GPMA worked with some of the remanufacturers to develop some revisions to its original proposal for paragraph G-S.1.(e) which read as follows:

(e) In addition to the markings required in paragraphs (a) and (d), any commercial weighing and measuring devices, other than a device that is new from the manufacturer, must be marked (in addition to the original equipment manufacturer's markings) to identify the source of the device. The source may be either the remanufacturer, rebuilder, or refurbisher of the device.

This revised proposal received support from some of the remanufacturers present; however, a general consensus on the language was not reached.

Prior to the Interim Meeting the Committee received numerous comments from the retail motor-fuel dispenser service industry indicating its opposition to the proposal as stated. The Committee received petitions from the owners of retail motor-fuel installations which stated that the proposal as written 1) inadequately defined remanufactured and remanufacturer, 2) addressed a problem already controlled by existing regulation, 3) did not recognize that used/rebuilt retail motor-fuel equipment is economically and environmentally a sound practice, and 4) would lead to restrictions on the buying, selling and reuse of remanufactured devices.

While remanufacturers did not appear to object to the concept of identifying remanufactured devices they did express concerns over the restrictions which might be placed on the use of remanufactured devices and how they conduct business. Some remanufacturers present at the special meeting indicated that they routinely relabel devices, although it appears that there is some inconsistency in the information placed on those labels.

Comments to the Committee prior to the Interim Meeting indicated that the term "remanufactured" was vague, unreliable, unrealistic, undefinable, and too broad to address the specific circumstances surrounding each technology. It was clear from the many comments received that there is a genuine concern over whether the proposed code should apply to all classes of devices or specific device types. Representatives from the scale industry indicated that this requirement might be more appropriate if it were placed in the Liquid-Measuring Devices Code. GPMA indicated they proposed that the requirement become part of the General Code at the suggestion of weights and measures officials. Comments from GPMA indicate that its original intent was not to require a device which is moved from one location to another to be relabelled. GPMA also noted that at the first indication of a problem with a retail motor-fuel dispenser, the original equipment manufacturer (OEM) is frequently contacted by the device owner. In response, the OEM sends an engineer to investigate the problem only to discover that the nonoperational components were not factory parts nor were they installed by the OEM's authorized representative.

In reviewing the original proposal, the Western and Northeastern Weights and Measures Associations considered a remanufactured device one which was removed from service and substantially altered or rebuilt. The Western felt use of the term "removed from the location" in defining a remanufacturer might be interpreted to apply to devices temporarily installed in a location. The Northeastern supported the intent of the proposal with the suggestion that "offered for sale" be incorporated into the G-S.1. description of a remanufacturer. The Western did not incorporate the date of remanufacture as part of the identification requirements. The Western also felt that the definition of "remanufactured" needed further clarification and study so it gave this proposal informational status. The Southern Weights and Measures Association supported the intent of the proposal and encouraged the NCWM S&T Committee to address the issue; however, it believed

the definitions warranted further clarification and study before recommending the proposal for a vote. Particular areas of concern include multiple interpretations of the terms "removed from service," "repaired," "refurbished," "reconditioned," "resold," etc., as used in the definition and in context with various types of technology. The Southern noted that additional input may be needed from all manufacturers who might be impacted by the addition of this requirement to the General Code. The Southern also indicated that once a definition is established, consideration must be given to how the field official will enforce the requirement.

The Scale Manufacturers Association (SMA) indicated that it appreciates GPMA's concern, but does not feel that this situation should be addressed in the General Code Section of Handbook 44. It was noted that the proposed language might be applicable in at least eight measuring device code sections. An alternative suggestion was to place the requirement in the general code with some indication that it applies only to the measuring devices.

Consideration was also given to existing NTEP policy, which states that changes to the original equipment manufacturer's design require the remanufacturer to obtain a separate Certificate of Conformance for the device. It was pointed out that it is difficult for field officials to determine whether design changes have occurred which are no longer consistent with the original manufacturer's design. One remanufacturer present noted that it was not the intent of remanufacturers to change time-proven designs. Many comments were expressed on the need to know exactly when a device is no longer traceable to the original equipment manufacturer once the original components are replaced with equivalent parts. Additional concerns centered on the inability of a new owner to determine who is responsible for equipment after a change in ownership or when multiple repairs have been made to an individual device. Also questioned was the number of labels that could be placed on one device; the concern was raised that this may add to the confusion over who is responsible for a device, thus undermining the whole purpose of relabelling with the remanufacturer information. Other comments indicated that this may be a jurisdictional problem because some weights and measures offices do not receive adequate notification of work performed by registered servicepersons and agencies.

The Meter Manufacturers Association (MMA) indicated its support for requiring a remanufacturer's label and a separate certificate due to safety and performance issues that may surface when specific components, such as the metal specifications, are altered on a device. It was noted that NTEP policy does address replacement parts and substitution of load cells for NTEP scales. Additionally, scale systems and components, unlike other devices, are also evaluated for influence factors, such as temperature.

The GPMA believes that identification of remanufactured equipment would be beneficial to weights and measures officials and equipment purchasers. GPMA felt that this information ensures the traceability of equipment by providing the information necessary to determine the party responsible for a device which may lay beyond the original manufacturer. The Central Weights and Measures Association supports the proposal as written from the GPMA.

Scales Code

320-1 W S.2.3.X. Dump-Through Vehicle Scales

(This item was withdrawn.)

Source: Central Weights and Measures Association

Discussion: The Committee reviewed a proposal to add the following paragraph to the Scales Code of Handbook 44:

> S.2.3.X. Dump-Through Vehicle Scales. - On a dump-through vehicle scale, if the receiving hopper is attached to the load receiving or weighing element. Provisions shall be made to inhibit the printing of a tare weight until the receiving hopper is completely empty.
> (Added 1997)

The Central Weights and Measures Association had encountered dump-through scales being used in grain weighing operations. Inspectors observed installations where the scale operator obtains a tare weight for the truck while unaware that grain remains in the hopper. The system design is such that the operator is unable to determine that grain is still present in the hopper. Additionally, it is possible for grain to continue to move through the system without detection. The

movement of the undetected grain in the system results in inaccurate net weights, which have generated subsequent complaints.

The proposed Handbook requirement was recommended to prevent the premature determination of tare weights before the hopper is empty. The Central recommended that this requirement also be applied to railway track scales used for similar weighment, and recommended that the requirement be nonretroactive as of January 1, 1998.

The Committee observed a video in which weighings were performed at a dump-through vehicle scale. The Committee acknowledged a possible problem in determining tare weights; however, it had concerns about a requirement being added to the Specifications section, rather than to the User Requirement Section. The Committee heard comments from the Scale Manufacturer's Association (SMA) indicating that the various manufacturers of weighing system components are not able to control how the device is assembled and that this might be more appropriately remedied as a user requirement. The Committee considered adding a user requirement; however, further discussion indicated that there are already sections of the General Code such as "G-S.2. Facilitation of Fraud" and "G-UR.3.2 Associated and Nonassociated Equipment" which may adequately address the situation. These code requirements already require that equipment be constructed, assembled, and installed for use so that it does not facilitate fraud and require the device to meet performance requirements when any associated equipment is operated in its usual manner and location. The Committee did not receive additional comments on this proposal from other jurisdictions encountering similar problems. Because the Committee felt that the General Code paragraphs noted above already address this issue, the creation of a separate Handbook 44 Code requirement did not seem warranted at this time. Consequently, the Committee has withdrawn this issue from its agenda.

320-2 V Table 3 Parameters for Accuracy Classes; Multiple Range and Multi-Interval Scales

(This item was adopted.)

Source: Central Weights and Measures Association

Recommendation: Add a footnote to Table 3 to address the accuracy class of multiple range and multi-interval scales as follows:

Table 3
Parameters for Accuracy Classes

Class	*Value of the verification scale division (d or e[1])*	*Number of scale divisions (n)*	
		Minimum	*Maximum[4]*
	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]	*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 that 2 kg*	*2 000*	*10 000*
IIII	*equal to or greater than 5 g*	*100*	*1 200*
	INCH-POUND Units		
III	*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. For Class III and IIII devices, the value of "e" is specified by the manufacturer as marked on the device; "e" must be less than or equal to "d."

[2] A scale marked "For prescription weighing only" may have a scale division not less than 0.01 g. (Added 1986)

[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 1 000.

[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 element shall not exceed the maximum specified for the accuracy class.
(Added 1997)

[Nonretroactive as of January 1, 1986.]
(Amended 1986, ~~and~~ 1987 and 1997)

Discussion: The Central Weights and Measures Association reported that questions are frequently asked about the maximum number of scale divisions (n) allowable for scales equipped with either the multiple range or multi-interval feature. It is believed that the addition of a footnote describing how the maximum number of divisions is to be calculated for scales with these features will address questions which may arise from the field official and device manufacturer.

The proposal originally submitted by the Central included a reference to a maximum of 10 000 divisions. The Committee heard comments expressing concern that the language appeared to limit Class I and II devices to a maximum of 10 000 divisions; however, the Committee did not believe that this was the original intent of the proposal. Consequently, the Committee removed the reference to "10 000 divisions" from the proposal.

The Committee believes the proposed footnote will help to eliminate confusion about how to correctly calculate the number of divisions for scales with multiple range and multi-interval features.

Based on comments reviewed at the 1997 Annual Meeting, the Committee made further modifications to the original footnote, to clarify that the maximum permissible values are specific to each particular accuracy class. The Scale Manufacturers Association supported the modifications to the original proposal which are intended to clarify the requirement.

320-3 VC N.1.3.4. Shift Test for Vehicle Scales, Axle-Load Scales and Livestock Scales with More Than Two Sections; Definition for "r" Factor

(This item was adopted as part of the consent calendar)

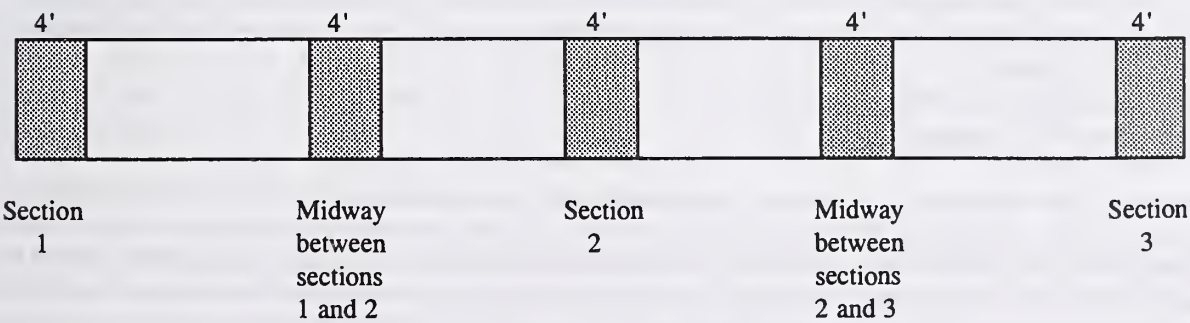
Source: Southern Weights and Measures Association

Recommendation: Modify N.1.3.4. as follows:

N.1.3.4. Vehicle Scales, Axle-Load Scales, and Livestock Scales With More Than Two Sections. - A shift test shall be conducted with at least two different test loads and may be performed anywhere on the load-receiving element using the prescribed test patterns and maximum test loads specified below. (Two-section livestock scales shall be tested consistent with N.1.3.8.) (Amended 1991)

(a) Prescribed Test Pattern. The normal prescribed test pattern shall be an area ~~at least~~ of 1.2 m (4 ft) ~~long~~ in length and as wide as the scale platform. Multiple test patterns may be utilized when loaded in accordance with Paragraph (b).
(Amended 1997)

(b) Maximum Loading. When loading the scale for testing, one side of the test pattern shall be loaded to no more than ~~one quarter~~ half of the concentrated load capacity (CLC) or test load before loading the other side. The area covered by the test load may be less than 1.2 m (4 ft) x the width of the scale; for test patterns less than 1.2 m (4 ft) in length, the maximum loading shall meet the formula (wheel base of test cart or length of test load divided by 48 in) x 0.9 x CLC. The maximum test load applied to ~~the prescribed~~ each test pattern shall not exceed the concentrated load capacity ~~or,~~ of the scale. When the test pattern exceeds 1.2 m (4 ft), the maximum test load applied shall not exceed the concentrated load capacity times the largest "r" factor in Table UR.3.2.1. for the length of the area covered by the test load. For ~~scales~~ weighing elements installed prior to January 1, 1989, the rated section capacity may be substituted for concentrated load capacity to determine maximum loading. An example of a possible test pattern is shown below:
(Amended 1997)



Add a definition to Appendix D, Definitions of Handbook 44 to read as follows:

"r" factor. A computation for determining the suitability of a vehicle scale for weighing vehicles with varying axle configurations. The factor was derived by dividing the weights in FHWA Federal

Highway Bridge Gross Weight Table B by 34 000 lbs. (The resultant factors contained in Table UR.3.2.1.)

Discussion: At its 1996 Annual Meeting, the NCWM adopted changes to Handbook 44 which recognized the relationship between the Federal Highway Administration Bridge Gross Weight Formula and the "r" factor. A user requirement, UR.3.2.1. and accompanying Table UR.3.2.1. were added to the Scales Code to specify the maximum loading of a vehicle scale for a given vehicle based upon the axle configuration of the vehicle and the scale's concentrated load capacity (CLC). At the 1996 Annual Meeting, the S&T Committee was also asked to consider the changes outlined in the above recommendation; however, the Committee felt that these changes were too significant to propose without due study and consideration by full membership of the NCWM. Consequently, the Committee suggested that proposed changes be submitted for consideration at a later time.

The recommended changes proposed in this item modify paragraph N.1.3.4. to recognize that testing equipment does not always fit within the 4-foot long spacing specified in the paragraph. The proposed modifications specify that, if a longer testing pattern is used, the spacing should correspond to the values specified in Table UR.3.2.1. The recommended changes also included the proposed addition of a definition to explain the term "r factor" which currently appears in Table UR.3.2.1.

During the 1997 Interim Meeting, the Committee heard comments that restricting one side of the test pattern to one quarter of the test load may create difficulty for agencies which must align motorized tests carts to achieve the proper test pattern. The Committee reviewed past conference reports to determine whether or not there were any conflicts with modifying the maximum loading pattern to one half the test load. It was felt that the original restriction may have been designed to prevent damage to the scale deck and possibly the load cell; however, discussions with large scale manufacturers indicate that loading a scale with such a pattern would not create problems. Therefore, the Committee recommends changing the requirement to permit the loading of one side of the test pattern to one half the test load before loading the other side.

Based on comments, heard during the Annual Meeting Open Hearing, from the Scale Manufacturers Association in support of the language proposed by the Central, the Committee modified the original proposal to include provisions for test equipment which may be less than 1.2 m (4 ft) in length. The Committee believes the modifications to the proposal allows a shift test to be conducted with all possible configurations of testing equipment.

320-4 W N.1.5. Discrimination Test

(This item was withdrawn.)

Source: Central Weights and Measures Association

Discussion: The Committee considered the following recommendation:

N.1.5. Discrimination Test. - A discrimination test ~~shall~~ may be conducted on all automatic indicating scales with the weighing device in equilibrium at zero load and at maximum test load, and under controlled conditions in which environmental factors are reduced to the extent that they will not affect the results obtained.
[Nonretroactive as of January 1, 1986.]
(Added 1985) (Amended 1997)

The Central reported difficulties in performing discrimination tests on both automatic and nonautomatic indicating scales during field testing. The Central believes that environmental conditions are sometimes so adverse that they prevent the performance of a discrimination test. Additionally, it felt that discrimination tests are more appropriate as part of the type evaluation process or initial inspection by weights and measures officials. Several jurisdictions indicate that they do not conduct discrimination tests. The Central believes that the change in the wording from "shall," which is mandatory, to "may," which is permissive, still allows jurisdictions to continue to conduct discrimination tests when environmental factors are favorable and take action on devices which do not meet compliance.

The Committee recognizes that the discrimination test is intended to be performed only if the environmental factors can be reduced to the extent that they do not affect the accuracy of the results. The Committee also considered alternate language which might clarify when this test should be performed; however, the Committee believes that the language added to the

Introduction Section of Handbook 44 as a result of a 1996 emergency item on this issue addresses this situation. The Committee was concerned that changing the requirement to include the word "may" could result in the interpretation that the test is optional even in applications where the environmental conditions are well-controlled. Consequently, it is does not believe that modifications should be made to N.1.5. at this time and has withdrawn this item from its agenda.

320-5 VC T.N.9. Radio Frequency Interference (RFI) and Other Electromagnetic Interference Susceptibility

(This item was adopted as part of the consent calendar.)

Source: Central Weights and Measures Association

Recommendation: Amend paragraph T.N.9. as follows:

T.N.9. Radio Frequency Interference (RFI) and Other Electromagnetic Interference Susceptibility. - The difference between the weight indication ~~with~~ due to the disturbance and the weight indication without the disturbance shall not exceed one scale division (d) or the equipment shall:
(Amended 1997)

(a) blank the indication, or

(b) provide an error message, or

(c) the indication shall be so completely unstable that it could not be interpreted, or transmitted into memory or to a recording element, as a correct measurement value.

(Added 1986)

The tolerance in T.N.9. is to be applied independently of other tolerances. For example, if indications are at the allowable basic tolerance error limits when disturbances occur then it is acceptable that the indication may exceed the applicable basic tolerances during the disturbance. (Added 1997)

Note: During the editorial review after the 1997 NCWM Annual Meeting, the text in the footnote was revised to clarify the intent of when tolerances are applied and acceptable, in concurrence with the NCWM S&T Committee.

Discussion: The Central recommended additional language to clarify the intent of the applicable tolerance in T.N.9. It is noted that there is currently a misunderstanding about the correct way to apply this paragraph. An example given of how this tolerance may be misinterpreted is that of a 30-lb capacity scale with 0.01 divisions, under a test load of 6 lbs, that is reading 6.02 lbs. As T.N.9. now reads, it appears an additional 0.01 lb (1 d) error would be permissible; thus, a scale reading of 6.03 lbs would be an acceptable change in indication for a 6 lb test load when subjected to RFI. This 0.03 lb error is outside of the allowable tolerance for the device based on Table 6. The confusion arises in determining how paragraph T.N.2.3. is to be applied. Paragraph T.N.2.3. states that the basic tolerances of Table 6 apply regardless of the influence factors in effect at the time of the conduct of the examination.

During the Interim Meeting Open Session, comments from officials and industry indicated that the focus should be on defining disturbances with significant fault and which tolerances apply when a device is subjected to influence factors.

The Committee agrees that paragraph T.N.9. is meant to limit *only* the variation in a scale's indication when the scale is subjected to RFI and other influences, and it is intended to be applied independent of paragraph T.N.2.3. However, the Committee acknowledges that T.N.9. may appear to conflict with paragraph T.N.2.3. and proposes the addition of a footnote to eliminate confusion.

The Committee received comments at the Annual Meeting which indicate a need for additional clarification of how the tolerances are applied due to and without the influence factor; so the original proposal was further modified to clarify those areas.

320-6 VC UR.2.9. Provision for Testing In-Motion Monorail Scales

(This item was adopted as part of the consent calendar.)

Source: Central Weights and Measures Association

Recommendation: Add a new paragraph UR.2.9. Provision for Testing In-Motion Monorail Scales to the User Requirements in Handbook 44 as follows:

> ***UR.2.9. Provision for Testing In-Motion Monorail Scales. - Provisions shall be made at the time of installation of an in-motion monorail scale for testing in accordance with N.1.3.6.1. (a rail around or other means for returning the test carcasses to the scale being tested).***
> ***[Nonretroactive as of January 1, 1998]***
> **(Added 1997)**

Discussion: During the 1996 NCWM Annual Meeting, the Conference adopted N.1.3.6.1. In-Motion Monorail Scales. - Dynamic Tests with Livestock Carcasses as a test procedure that assesses the dynamic effects of a weighing-in-motion monorail scale. The Central felt that the proposed User Requirement in the above recommendation is needed to facilitate testing of the device with carcasses under conditions which reflect actual use.

The Committee received comments expressing concern that pulling carcasses into a rail around area might result in health and safety violations because the carcass is being handled more and is not processed as quickly. The Committee acknowledges and appreciates the health and safety regulations which apply to these plants; however, comments submitted indicate that use of rail around areas during testing might actually lessen the handling time of the carcasses compared with conventional test methods.

Comments from Grain Inspection, Packers and Stockyard Administration (GIPSA) indicate that an as-used test is essential for these devices since static tests with test weights do not duplicate the dynamic effects of a carcass on the weighing operation. It was also noted that most plants conduct their own accuracy tests several times a day due to their concern over the economic impact of an inaccurate scale. These same plants perform large numbers of weighings where they typically have incorporated a rail around design into these new installations.

The Committee also heard concerns over the expense of modifying existing plants to meet the new user requirement; however, it should be noted that the requirements are intended to be applied only to new scale installations.

The Committee believes that the proposed requirement for a rail around area would help to facilitate testing, decrease handling time, and provide an indication of the dynamic performance of the scale as it is used.

320-7 W U.R.3.1. Recommended Minimum Load and Table 8 Recommended Minimum Load

(This item was withdrawn.)

Source: Northeastern Weights and Measures Association (NEWMA)

Discussion: The Committee considered the following proposal to remove the term "recommended" from paragraph UR.3.1 and Table 8:

> UR.3.1 ~~Recommended~~ Minimum Load. ~~-A recommended~~ The load is specified in Table 8 since the use of a device to weigh light loads is likely to result in relatively large errors.

Table 8 ~~Recommended~~ Minimum Load		
Class	Value of scale division (d or e*)	~~Recommended~~ minimum load (d or e*)
I	equal to or greater than 0.001 g	100
II	0.001 to 0.05 g, inclusive	20
	equal to or greater than 0.1 g	50
III	All**	20
III L	All	50
IIII	All	10

*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. For Class III and IIII devices the value of "e" is specified by the manufacturer as marked on the device; "e" must be less than or equal to "d."

**~~A~~ The minimum load of 10 d ~~is recommended~~ for a weight classifier marked in accordance with a statement identifying its use for special applications.
(Amended 1990 and 1997)

Comments from the Western Weights and Measures Association indicate that the removal of the word "recommended" from paragraph UR.3.1. and Table 8 would create a mandatory minimum load requirement for all transactions that would be difficult to enforce. The Southern Weights and Measures concurred with the Western's position. The Southern recognizes that the NCWM has made this proposal in the past; however, while it appreciates the intent of the proposal and agrees with it in principle, the Southern also felt it unrealistic to enforce. In considering past recommendations, the NCWM was unable to develop a proposal which adequately addressed the concerns of suitability for all types of devices. During its open hearing session, the Southern heard comments that it might be appropriate to clarify the intended application of the requirement. Consequently the Southern recommended keeping all reference to "recommended" in paragraph UR.3.1. and Table 8. and to insert the term "net" prior to the term "load."

Committee discussions during the Interim Meeting, acknowledged that confusion sometimes arises over whether this table is intended to specify minimum net load or gross load. The Committee noted that the correct interpretation of this paragraph is that the term "minimum load" refers to the "net" load. The Committee considered adding the term "net" to the table to eliminate this confusion; however, the Committee did not feel that removal of the term "recommended" or addition of the term "net" is appropriate at this time because of the difficulty in consistently enforcing the criteria without additional guidelines for the field official. For example, a 30 lb x 0.01-lb deli scale is not suitable for use under 20 d on a regular basis; however, preventing occasional use below the minimum is unrealistic. Consequently, the Committee has withdrawn this item from its agenda.

320-8 VC Definitions for Maximum Number of Scale Divisions (n_{max}) and Minimum Verification Scale Division (e_{min})

(This item was adopted as part of the consent calendar.)

Source: Western Weights and Measures Association

Recommendation: Add definitions for n_{max} (maximum number of scale divisions) and e_{min} (minimum verification scale division) to Appendix D the Definitions section of NIST Handbook 44 as follows:

n_{max} (maximum number of scale divisions). The maximum number of scale divisions for which a main element or load cell complies with the applicable requirements. The maximum number of scale divisions permitted for an installation is limited to the lowest n_{max} marked on the scale indicating element, weighing element, or load cell.[2.20, 2.21]

e_{min} (minimum verification scale division). The smallest scale division for which a weighing element complies with the applicable requirements.[2.20, 2.21]

Discussion: During its 1996 Annual Meeting, the NCWM added a definition for Load Cell Verification Division (v_{min}) to NIST Handbook 44. It was noted during discussion at the 1996 Interim Meeting that there was an absence of terms to define other parameters which are used to describe accuracy and other requirements for weighing elements. The S&T Committee indicated its belief that future consideration should be given to including the definitions in Handbook 44 for Maximum Number of Scale Divisions and Minimum Verification Scale Division. Additionally, it was noted that the appropriate references to scale division (d), verification scale interval (e), and number of scale divisions (n) should be part of these definitions.

The Committee supported the proposed definition for n_{max} and continued to encourage any additional input which further provides definitive language for these terms. During the open hearing, the Committee heard comments that e_{min} is most accurately described by not limiting the definition to the effects on the weighing element when subjected to influence factors alone, but should recognize the smallest scale division at which the weighing element is able to comply with all the applicable requirements.

The Scale Manufacturer's Association indicated support for the proposal's intent to define the maximum number of scale divisions; however, it favors the definition of minimum verification scale division as it applies to the full range of applicable requirements.

The Southern Weights and Measures Association supported the Western's proposed definition for n_{max} and e_{min}.

At the Annual Meeting, the Committee heard comments that the definition of e_{min} should be expanded to include other components in a weighing system.

Belt-Conveyor Scale Systems Code

321-1A I UR.2.2.1. (c) for Scales not Installed by the Manufacturer

(Item 321-1 was separated into two parts 321-1A and 321-1B during the 1997 Interim Meeting to facilitate review of the issues involved.)

Source: Central Weights and Measures Association; Item 321-1

Recommendation: Modify paragraph UR.2.2.1.(c) as follows:

UR.2.2.1. For Scales not Installed by the Manufacturer. - Unless the scale is installed in a short conveyor designed and furnished by the scale manufacturer or built to the scale manufacturer's specifications, the conveyor shall comply with the following minimum requirements:

(c) If there is a concave curve in the conveyor ~~between~~ before or after the scale ~~and the loading point~~, the scale shall be installed so that the belt is in contact with all the idlers rollers at all times for at least 6 m (20 ft) or 5 idler spaces, whichever is greater, before and after the scale.[2] A concave curve ~~beyond the scale~~ shall start no closer than 12 m (40 ft) from the scale to the tangent point of the concave curve.

(Amended 1997)

Discussion: This item was originally presented as a single proposal with the proposal in 321-1B. This part of the proposal was subsequently presented as a separate item because the Committee felt that further study was warranted to define the term "scale quality type idlers." The Committee agreed that the proposed changes to UR.2.2.1.(c) for the location of a concave curve in the conveyor and the contact points of the belt with the idler rollers was a separate issue from the determination of whether the scale systems idlers are "scale quality type idlers" as proposed in paragraph UR.2.2.1.(g). Consequently, paragraph UR.2.2.1.(g) was moved from item 321-1 until such time that work could be completed on a definition of "scale quality type idlers."

The Belt Conveyor Sector supports the recommended proposal by the National Coal Weighing and Sampling Association (NCW&SA). The NCW&SA believes that it is important to give equal consideration to a concave curve in the conveyor belt before and after the scale and that it should be mandated that all rollers be in contact with the belt in order for the installation to meet the accuracy and repeatability requirements in Handbook 44.

The Central supported this proposal.

The Committee heard comments at the Annual Meeting which indicate that the proposal is unclear in the reference to the position of the curve and its relation to the tangent point of the curve. The Committee agrees that there is some ambiguity about the term "short conveyor"; therefore, it has removed this item from the voting calendar and given it informational status until the text is expanded to add clarification in those areas.

321-1B I UR.2.2.1. (g) for Scales not Installed by the Manufacturer

(This item was added to the Committee's agenda as a result of discussions during the Interim Meeting.)

Source: Central Weights and Measures Association; Item 321-1

Discussion: This item was originally presented as single proposal (321-1) combined with the proposal in 321-1A. This part of the proposal was subsequently presented as a separate item because the Committee felt that further study was warranted to define the term "scale quality type idlers." The Committee agreed that the proposed changes to UR.2.2.1.(c) for the location of a concave curve in the conveyor and the contact points of the belt with the idler rollers was a separate issue from the determination of whether the scale systems idlers are "scale quality type idlers" as proposed in paragraph UR.2.2.1.(g). Consequently, paragraph UR.2.2.1.(g) was moved from item 321-1 until such time that work could be completed on a definition of "scale quality type idlers."

In 1995, the Conveyor Equipment Manufacturers Association (CEMA) adopted a voluntary standard for "Scale Quality Idlers". The new standard requires idlers to be designed to ensure minimum deflection under load and includes other alignment criteria necessary to ensure an accurate weighment. The National Coal Weighing and Sampling Association (NCW&SA) has determined that idlers which do not meet these established standards have been known to deflect under load, thus causing nonlinearity in belt-conveyor scale systems. The Central Weights and Measures Association supported this proposal and has asked that the S&T Committee consider the following modifications to UR.2.2.1.:

> **UR.2.2.1. For Scales not Installed by the Manufacturer. - Unless the scale is installed in a short conveyor designed and furnished by the scale manufacturer or built to the scale manufacturer's specifications, the conveyor shall comply with the following minimum requirements:**
>
> **(g) The scale area and 4 idlers on both ends of the scale shall be of a contrasting color, or other suitable means shall be used to distinguish the scale from the remainder of the conveyor installation, and the scale shall be readily accessible. <u>The scale area and 4 idlers on both ends of the scale shall be scale quality type idlers.</u>**

The Committee believes that further definition of the term "scale quality idlers" is needed before the Committee can make a decision on whether or not this change is appropriate. The Committee acknowledges that scale quality idlers will create a level playing field; however, without additional information on the use of the term, the Committee is not certain if is realistic to expect a field official to identify an idler as "scale quality." The Committee was made aware of the Conveyor Equipment Manufacturers Association (CEMA) Standard Number 502 which contains belt scale idler standards and a copy of this standard was provided to the Committee following the meeting. The Committee is interested in determining whether

or not these standards have been uniformly adopted industry-wide. Additionally, the Committee believes that any standards which are to be recognized must be assimilated into a format that is easily interpreted and implemented in field applications.

The Committee has requested input from the NCW&SA and other interested parties on this issue. The Committee has made this item informational to enable additional information to be provided. The Committee also noted that the use of the term "short" in the existing paragraph without further qualification is unclear. The Committee also asks for input on possible changes or qualifications to ensure uniform interpretation and application of the term "short."

During the Annual Meeting, the Committee restated its request for input from the belt conveyor industry in establishing clarification of the term "scale quality idlers" and how they will be determined during field examination of these devices.

Automatic Bulk Weighing System Code

322-1 VC S.3.3. Overfill Sensor

(This item was adopted as part of the consent calendar.)

Source: Central Weights and Measures Association

Recommendation: Modify paragraph S.3.3. Overfill Sensor to read as follows:

S.3.3. Overfill Sensor. - ~~**The weigh hopper shall be equipped with an overfill sensor which will cause the feed gate to close, activate an alarm, and inhibit weighing until the overfill condition has been corrected. (Added 1993)**~~

(a) **The weigh hopper shall be equipped with an overfill sensor which will cause the feed gate to close, activate an alarm, and inhibit weighing until the overfill condition has been corrected.**
(Added 1993)

(b) ***If the system is equipped with a lower garner or surge bin, that garner shall also 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)

Discussion: Comments received from the Central indicate that a condition sometimes occurs in automatic bulk weighing systems during the filling operation of multi-car trains where the weigh hopper may continue to deliver drafts into the lower garner while the cars are in motion. When the lower garner is overfilled, the grain will contact with the weigh hopper, resulting in an inaccurate weighment. The Central believes that the addition of a requirement for an overfill sensor on the lower garner or surge bin will prevent inaccurate weighments; however, the Central felt the requirement should be nonretroactive as of January 1, 1998.

The Committee did not receive any unfavorable comments on this proposal. One suggestion made to the Committee was to include definitions of the terms "garner" and "surge bin"; however, no specific proposals were submitted for consideration.

During the Annual Meeting, the Committee heard a recommendation from Cargill, Incorporated to modify the proposal. Based on those comments, the Committee modified paragraph (b) of the original proposal to require the garner to be equipped with an overfill sensor which will cause the gate of the weigh hopper to remain *open* until the hopper has been completely emptied. The Committee believes that this change meets the intent of the proposed requirement, to prevent an inaccurate weighing operation, and aligns the requirement with current Grain Inspection, Packers and Stockyard Administration (GIPSA) regulations.

Automatic Weighing Systems - Tentative Code

324-1 VC Recognition of Shipping Applications; Clarification of Code Requirements

(This item was adopted as part of the consent calendar.)

Source: Automatic Weighing Systems (AWS) Work Group/Western Weights and Measures Association

Recommendations: The AWS Work Group proposes the following changes to the AWS Code.

Modify Paragraph A.1. as follows to expand the application of the code to other than just food products:

A.1. - This code applies to devices used to weigh ~~packages of food products~~ or ~~to~~ fill packages while the object is in motion.

This includes:

(a) Weigh-labelers

(b) Automatic checkweighers

Add a new accuracy class IIIS and tolerance to table S.6. to recognize tolerances for shipping applications as shown in the table below:

Table S.6.
Parameters for Accuracy Classes

Class	Value of the verification division (d or e)	Number of divisions (n)	
		Minimum	Maximum
SI Units			
III	0.1 to 2 g inclusive	100	10 000
	equal to or greater than 5 g	500	10 000
Inch-Pound Units			
III	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 lbs	500	10 000
	equal to or greater than 0.25 oz	500	10 000
IIIS	greater than 0.01 lb	100	1000
	greater than 0.25 oz	100	1000

For Class III devices, the value of "e" is specified by the manufacturer as marked on the device; "d" shall not be smaller than 0.1 "e." "e" shall be differentiated from "d" by size, shape, or color.

Modify paragraph S.5.1. to recognize Class IIIS applications to correspond with the proposed changes to Table S.6. as follows:

S.5.1. Marking. - Weigh-labelers and automatic checkweighers shall be Class III devices and shall be marked accordingly, except that a weigh-labeler marked Class IIIS may be used in package shipping applications.

Modify N.1.1. as follows:

N.1.1. Test Pucks and Packages. - ~~Test pucks and packages shall be:~~

~~(a) Representative of the type, size, and weight ranges to be weighed on the device; constructed of a solid, constant mass, nonhygroscopic, nonelectrostatic, and nonmagnetic type of material.~~

~~(b) Constructed so that metal-to-metal contact is avoided.~~

~~(c) Stable while in motion, hence the length and width of a puck or package should be greater than its height.~~

~~(d) Supplied by the manufacturer for type evaluation purposes for each weight range of testing.~~

(a) Test pucks and packages shall be:

(I) representative of the type, size, and weight ranges to be weighed on a device,

(ii) be stable while in motion, hence the length and width of a puck or package should be greater than its height,

(b) For type evaluation the manufacturer shall supply the test pucks or packages for each range of test loads.

Modify the title of paragraph T.3.1. as follows to clarify its application:

T.3.1. Tolerance Values - Class III Weigh Labeler (See T.3.2. for Class IIIS Weigh-Labelers).

Add a new T.3.2. as follows, and renumber old paragraph T.3.2. to T.3.3.:

T.3.2. Tolerance Values - Class IIIS Weigh-labelers in Package Shipping Applications.

T.3.2.1. Static Tests - Tolerance values shall be as specified in Table T.3.2.1. Static Tolerances for Class IIIS Weigh-labelers.

Table T.3.2.1. Static Tolerance for Class IIIS Weigh-labelers

Test Load in Divisions	Tolerance in Divisions	
Class IIIS	Acceptance	Maintenance
0 - 50	± 0.5	± 1
51 - 200	± 1	± 2
201 - 1000	± 1.5	± 3

T.3.2.2. Dynamic Tests - Tolerance values specified in Table T.3.2.2. Dynamic Tolerances for Class IIIS Weigh-labelers shall be applied.

Table T.3.2.2. Dynamic Tolerance for Class IIIS Weigh-labelers		
Test Load in Divisions	Tolerance in Divisions	
Class IIIS	Acceptance	Maintenance
0 - 50	± 1.5	± 2
51 - 200	± 2	± 3
201 - 1000	± 2.5	± 4

Add a new paragraph UR.3.1.1. to apply to Class IIIS Weigh-labelers:

> **UR.3.1.1. Minimum Load for Class IIIS Weigh-labelers . - The minimum load as specified by the manufacturer, but not less than 10 divisions since the use of a device to weigh light loads is likely to result in relatively large errors.**

Modify the text of the definition for random error(s) to specify sample standard deviation. Replace the existing formula with the formula for sample standard deviation so that the paragraph and formula read as follows.

> **random error(s). - The sample standard deviation of the error (~~of indication~~ indicated values) for a number of consecutive automatic weighings of a load, or loads, passed over the load receptor, shall be expressed mathematically as:**

$$s = \sqrt{\frac{1}{n-1} \Sigma (x_i - \bar{x})^2}$$

During the Conference, it was suggested that the following alternative formula may also be used to determine sample standard deviation, because it is better suited to situations where it is necessary to perform calculations by hand.

$$s = \sqrt{\frac{1}{n-1} \left(\sum x_i^2 - \frac{(\sum x_i)^2}{n} \right)}$$

Where:

x_i = error of a load indication
n = the number of loads

Discussion: The proposed changes outlined above are based upon review of the existing code and proposals made by the Automatic Weighing Systems (AWS) Work Group at its last meeting. The proposed changes expand the code to include other than just food products, specify a tolerance for shipping applications, and eliminate unnecessary restrictions to the testing materials. Although the code has tentative status and is not currently being enforced, the requirements apply immediately to type evaluation. Consequently, the Work Group felt that these changes should be made without waiting for the code to attain permanent status.

The Western Weights and Measures Association supports the proposal as written, including the changes to recognize shipping applications. The Central Weights and Measures Association notes that expansion of the code to include a separate tolerance for shipping applications is appropriate based upon the recommendations of the AWS Working Group. The Committee also supports the proposal as written.

At the request of OWM, Dr. Lynne Hare of the NIST (Statistical Engineering Division) provided comments indicating that it was more appropriate to apply sample standard deviation in determining the random error in device performance. During its review, the Committee was informed that the number of error points is randomly determined and represents only a limited number of possible data over the lifetime of the device; therefore, the random error formula was changed to reflect sample standard deviation instead of population standard deviation.

Liquid-Measuring Devices Code

330-1 V S.1.6.4.1. Unit Price; Exclusions for Fleet Sales, Other Price Contract Sales and Truck Refueling Dispensers

(This item was adopted.)

Source: Carryover Item 330-3

Recommendation: Amend paragraph S.1.6.4.1. as follows to correct inconsistencies between the exclusion of fleet and price contract sales in the unit price posting requirements and other requirements in the Liquid-Measuring Devices Code:

S.1.6.4.1. Unit Price. -

(b) ~~If~~ Whenever a grade, brand, blend or mixture is offered for sale from a device at more than one unit price, then all of the unit prices at which that product is offered for sale shall be displayed or shall be capable of being displayed on the dispenser using controls available to the customer prior to the delivery of the product. It is not necessary ~~that~~ to display all of the unit prices for all grades, brands, blends, or mixtures ~~be~~ simultaneously ~~displayed~~ prior to the delivery of the product. This subsection shall not apply to fleet sales, other contract sales, or truck refueling sales (e.g., sales from dispensers used to refuel trucks). ***(Effective and nonretroactive as of January 1, 1991.)***

(Amended 1989 and 1997)

Discussion: Comments received during the 1996 Annual Meeting suggested that the addition of an exemption to "truck refueling" in paragraph S.1.6.4.1.(b) would conflict with intent of paragraph UR.3.3.(d). Paragraph UR.3.3.(d) requires that a truck stop dispenser used exclusively for refueling trucks either comply with the requirements of paragraph S.1.6.4.1. or post the highest price on the dispenser. The Committee was not able to reach a clear consensus at that time on whether or not a conflict actually exists and whether or not an exemption from both S.1.6.4.1.(b) and UR.3.3.(d) should be given to truck stop dispensers used exclusively for refueling trucks.

Since the NCWM specifically voted in 1993 to add paragraph UR.3.3.(d) to Handbook 44, the Committee was reluctant to add language to S.1.6.4.1.(b) which might create a conflict. (See NIST Special Publication 906, 1996 NCWM S&T Committee Report Item 330-3 for additional discussion on the origins of paragraph S.1.6.4.1.) Therefore, the Committee recommended that the item be given "Informational" status until further study of the issue be made and additional input obtained from NCWM members on whether or not such an exemption would be appropriate. The Committee encouraged input on this issue from the regional associations and from manufacturers and users of the equipment.

The Northeastern Weights and Measures Association supported the original proposal which proposed an exemption from unit price posting for dispensers used exclusively for fleet sales, other price contract sales, or truck refueling.

The Western Weights and Measures Association received input from the County of San Diego indicating that there appears to be a conflict or, at the minimum, an ambiguity would exist between S.1.6.4.1.(b) and UR.3.3.(d) if the proposal were adopted. The Western recommended that if the Committee wishes to amend S.6.4.1.(b), then UR.3.3.(d) should also be amended to exempt fleet sales, other price contract sales, and truck refueling operations from the requirement to be computing devices.

The Southern Weights and Measures Association, while acknowledging the efforts to ascertain whether or not there were conflicts between S.1.6.4.1. and UR.3.3.(d), maintained its support of the original proposal and did not believe the proposed language created a problem.

During the open session of the Interim Meeting, the Committee heard comments from industry representatives supporting the proposed changes to S.1.6.4.1. and the suggested modifications to UR.3.3. (d). The Committee received additional comments from weights and measures officials indicating there did not appear to be any conflict between the two code requirements. The Committee believes that modifying paragraph S.1.6.4.1. to include an exemption for fleet and price contract sales in unit price posting requirements will clarify any inconsistencies which now exist over unit price posting. The Committee felt that the modification of S.1.6.4.1. does not create a conflict with UR.3.3, therefore it recommends that no changes be made to UR.3.3. at this time.

The Committee heard comments that there was concern over language in the original proposal, which exclusively limited the use of dispensers to a single market. Additional comments from industry and weights and measures officials indicated that an alternate proposal would allow use of the dispensers for sales to the general public, fleet sales, other contract sales, or sales for truck refueling, while providing the necessary unit price information to the general public. The Committee heard numerous comments in supports of the modified original proposal. The original proposal was modified to include the alternate language.

330-2 VC S.1.6.7. Recorded Representations, Point-of-Sale Systems and Appendix D, Definition for Point-of-Sale System

(This item was adopted as part of the consent calendar.)

Source: Western Weights and Measures Association

Recommendation: Amend S.1.6.7. Recorded Representations, Point-of-sale Systems as follows:

> *S.1.6.7. Recorded Representations, ~~Point-of-sale Systems. - The sales information recorded by cash registers when interfaced with a retail motor-fuel dispenser shall contain the following information for products delivered by the dispenser~~* - *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 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.*
> *[Nonretroactive as of January 1, 1986.]*
> **(Added 1985) (Amended 1997)**

Modify the definition for Point-of-sale System in Appendix D of Handbook 44 to read as follows:

> **point-of-sale system. An assembly of elements including a weighing or measuring element, an indicating element, and a recording element, (and may be equipped with a "scanner") used to complete a direct sales transaction. [2.20, 3.30, 3.32, 3.37]**
> **(Added 1986) (Amended 1997)**

Discussion: The Western Weights and Measures Association presented this proposal to establish requirements for a recording element and the specific recorded sales information for retail motor-fuel dispenser transactions completed through cash, credit card and debit card acceptors. It was also noted that the requirement for specific device identification information should be applicable at installations where more than one dispenser offers the same grade of product, for cash/credit card sales, or at other multiple unit prices. The individual dispenser information was determined to be useful in response to consumer complaints. The Western also recommended that the Committee consider amending the Liquefied Petroleum Gas Liquid-Measuring Devices and Mass Flow Meters Codes to include similar requirements for retail motor-

fuel applications. The Western noted that the original proposal making this information solely a user requirement would not be consistent with other code sections, where it is also a specification; Examples include: Vehicle Tank Meters paragraph S.1.4.2.; Cryogenic Liquid-Measuring Devices paragraph S.1.4.1.; Milk Meters paragraph S.1.4.2.; Mass Flow Meters paragraph S.2.7.; and Belt-Conveyor Scale Systems paragraph S.1.4. The Western also noted that the additional items specified in the NTEP checklist for transaction information are already covered by federal banking regulations and credit card companies that require the seller and purchaser identity on sales receipts.

The Office of Weights and Measures has been advised that non-NTEP jurisdictions have difficulty enforcing S.1.6.7. as it is currently written, in part because they do not require these devices to undergo NTEP evaluation and because the code specifically addresses cash registers, not other equipment interfaced with retail motor-fuel dispensers.

The Measuring Sector of the National Type Evaluation Technical Committee and the Southern Weights and Measures Association concurred that the scope of paragraph S.1.6.7. should be expanded to cover receipts issued by other equipment that is interfaced with retail motor-fuel dispensers. The Southern acknowledged the need to retain a recorded representation of transaction information and feels that this is most appropriately addressed by modifying S.1.6.7. This proposal, as submitted to the Committee, also suggested changes to UR.3.4.; however, the Southern expressed concern that older equipment might be adversely impacted by changes to UR.3.4. Consequently, it supported the expansion of S.1.6.7 rather than the changes to UR.3.4. (Also see the discussion in Item 330-6.)

The Committee acknowledges that the proposal does not contain language to address specific information which must be provided on receipts when a transaction conducted at a cash-activated dispenser requires a refund. The Committee recognized that the requirement for this information is already addressed under General Code Section G-S.2. Facilitation of Fraud and during NTEP evaluations. It was noted that specific dispenser identification information assists weights and measures officials in responding to consumer complaints. However, much of this information already appears on most receipts due to requirements created by federal banking regulations and as part of the agreements that exist between credit card companies and vendors. Therefore, the Committee did not include the requirement for this additional information in its proposal for S.1.6.7. The Committee agreed with the Sector's recommendation that the scope of S.1.6.7. be expanded to cover receipts issued by other equipment interfaced with retail motor-fuel dispensers and recommends adding the appropriate references to the definition of Point-of- Sale System.

During the NCWM Annual Meeting, there was one editorial change of "separable" to "separate."

330-3 W S.2.2. Provision for Sealing; Definition of System Controller as Used in the Audit Trail Criteria

(This item was withdrawn.)

Source: National Type Evaluation Technical Committee Measuring Sector

Discussion: The Committee was asked by the Measuring Sector of the National Type Evaluation Technical Committee to provide an interpretation of the term "system controller" as it is used in defining sealing requirements for a measuring device. There appear to be three areas which may need to be addressed: 1) a definition of system controller as used in the audit trail criteria, 2) clarification of what the wording "necessary to the operation of the device" represents in the definition of remote configuration capability, and 3) the term remote may not be clearly perceived in how it relates to communication between device components. The capability to remotely configure sealable parameters was permitted as an option to enable manufacturers to offer this feature to their customers. These devices were determined to be Category 2 Devices, which historically has meant that a central on-site console (service station or loading rack) is interfaced with multiple devices to retrieve information from separate devices through a hardware switch rather than a physical connection to each device. Additionally, when S.2.2. Provision for Sealing was established, concern was expressed over the facilitation of fraud when adjustments are no longer at the device; however, minimal information is provided (e.g., counters only) to track changes to the device.

The Committee recognized that there are multiple types of applications which utilize system controllers, however, it agreed with the recommendation of the Gasoline Pump Manufacturer's Association (GPMA), the Chairman of the National Type Evaluation Technical Committee (NTETC), Measuring Sector and Mike Keilty (Micro Motion) that the best forum to address this issue is the NTETC Measuring Sector. It was noted that several areas should be addressed, including but, not

limited to, the availability of equipment with remote communication capability and determining whether the manner in which this equipment interfaces with devices constitutes a system controller. Based on comments from manufacturers present, it appears that the mass flow meter is the specific device type which has generated a majority of these questions on the audit trail criteria. It was felt that this technology warranted a more in depth examination to determine the necessary forms and the minimum criteria for audit trails which are applicable to these devices. It was agreed that this process requires a level of technical expertise that is found in the membership of the Measuring Sector; therefore, the Committee withdrew this item from its agenda with the recommendation that it be sent back to the Sector for additional study.

The following is excerpted from the October 1996 Meeting Agenda of the National Type Evaluation Technical Committee, Measuring Sector and is provided as background information.

Background: Effective January 1, 1996, devices with remote configuration capability (Category 2) may provide access to the event counters for sealable parameters through the individual device or through the system controller, as noted in the table below. There are many devices in which a physical seal must be broken to access one component while actual changes to a sealable parameter are performed at a separate component. The advent of new technology has created unlimited possibilities in remote communication from modems, laptops and handheld units, some of which may conceivably be configured as the system controller. It may be more appropriate to consider the inherent differences of how system controllers are interfaced with the different types of device technology rather than use a standardized or generic approach on how they are to operate.

Although the "system controller" is a component which may undergo type evaluation and subsequently receive a Certificate of Conformance (CC), there is no established definition of what comprises the controller. There are installations which do not permit access to all sealable parameters either at the device or system controller. For instance, the adjustments to a retail motor-fuel dispenser measuring element are performed at the dispenser, while changes in the units of measurement are made at the console; in such cases, the console is usually a permanent on-site fixture and has been considered a "system controller."

Table S.2.2. Categories of Device and Methods of Sealing

Categories of Device	*Method 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. *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 and 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.]* [*Nonretroactive as of January 1, 1996]*
Category 3: Remote configuration capability access may be unlimited or controlled through a software switch (e.g., password)	*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 through the device or through another on-site device. The event logger shall have a capacity to retain records equal to ten 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 and enforceable as of January 1, 1995.]
(Table added 1993) (Amended 1995)

A specific example was presented to NTEP in which a motor-fuel dispenser could be configured remotely using a laptop computer, but access to remote configuration was enabled through hardware on the device. Consequently, the device falls

under Category 2 sealing requirements. As noted above, for Category 2 devices, the event counters may be located at the individual device or through a system controller. Locating the event counters in the system controller was permitted to recognize that service station consoles and other system controllers (such as loading rack meter controllers) may be used to configure multiple devices and locating the information in one central location was desirable.

In the example presented, the company elected not to enable access to the event counters at the individual device, but rather through the laptop computer. Since personal computers are often used as service station consoles, this approach was not inconsistent with other devices that have been evaluated by NTEP. However, in this specific example, the laptop computer was not interfaced with all of the other dispensers at the site and it was questionable whether or not the laptop computer would remain on site all times. In order to view the audit trail information, it would be necessary to physically connect the laptop to each individual dispenser.

NTEP does not believe that this approach meets the intent of the S&T Committee's proposal in 1993 to allow the use of the system controller for maintaining the counters for Category 2 devices. It was not intended that an inspector would have to physically plug a laptop into individual devices in a station. There is also concern over the possibility that the inspector might damage the equipment if the connections are not made correctly.

The S&T Committee was polled to determine whether or not NTEP's interpretation was correct. The Committee agreed with NTEP's interpretation.

330-4 W S.X. for Retail Motor-Fuel Dispensers; Use of Full Computing Dispensers

(This item was withdrawn.)

Source: Western Weights and Measures Association/California Agricultural Commissioners and Sealers Association

Discussion: To address the use of full-computing retail motor-fuel dispensers the Committee considered a proposal to add a new Handbook 44 paragraph UR.3.3.1. and renumber and retitle UR.3.3. (a) through (d) to UR.3.3.2. Total Price Calculation, parts (a) through (d) to read as follows:

UR.3.3. Computing ~~Device~~ Capability.

UR.3.3.1.. Use of Computing Devices. - Except for fleet sales, other price contract sales, marinas, and airports, retail motor-fuel devices shall be of the full computing type and shall indicate the quantity, the unit price, and the total price of each delivery.
[Nonretroactive as of January 1, 1999]
(Added 1997)

UR.3.3.2. Total Price Calculation.

(a) Any computing device placed into service after January 1, 1990, in an application where a product or grade is offered for sale at more than one unit price (excluding fleet sales and other price contract sales), shall be used only for sales for which the device computes and displays the sales price for the selected transaction. Individual single unit-price computing devices installed to replace existing devices or to add to station capacity are exempt from this requirement.
(Added 1989) (Amended 1992)

(b) A computing device shall be used only for sales for which the device computes and displays the sales price for the transaction.
(Added 1990)

(c) A truck stop dispenser used exclusively for refueling trucks is exempt from the requirements in (a) and (b) if all purchases of fuel are accompanied by a printed receipt of the transaction containing the applicable price per gallon, the total gallon delivered, and the total price of the sale.
(Added 1993)

(d) Unless a truck stop dispenser used exclusively for refueling trucks complies with S.1.6.4.1. (Display of Unit Price), the price posted on the dispenser and the price at which the dispenser is set to compute shall be the highest price for any transaction which may be conducted.

(Added 1993)

California has noted a number of inquiries as to the suitability of volume only dispensers in direct sale applications. In those installations it appears to be unreasonable to expect the retail customer, who usually purchases a predetermined monetary amount, to calculate the quantity-value which should be delivered for each transaction. Additionally this type of installation might require the owner/operator to perform similar calculations, thus further increasing the potential for mathematical errors.

When cash/credit pricing, multi-tier pricing, and motor-fuel prices above $1.00 per gallon were first introduced, retail motor-fuel dispensers did not have adequate capability to compute the total price for all sales. These situations resulted in a number of complaints being lodged with weights and measures officials. California has further concerns with customer delays, confusion, and the customer's inability to verify billing information. Currently station owners in direct sales applications have full computing type dispensers in operation. To permit the installation of noncomputing dispensers in direct sales applications would create a competitive disadvantage to station operators who have invested in and are maintaining computing type devices.

The California Agricultural Commissioners and Sealers Association recommended this requirement be included in other code sections where there are retail motor fuel applications, such as LPG.

The Office of Weights and Measures (OWM) has periodically received inquiries about the suitability of noncomputing retail motor-fuel dispensers for use in sales to the general public. OWM's response has been and continues to be that dispensers in an application for sales to the general public should be equipped with computing capability.

The rationale for the OWM position is consistent with that of California and reflects its concerns in the following areas: 1) suitable equipment to enable the user/customer to quickly determine the correct quantity and total price that is charged for the product; 2) facilitation of fraud through the use of noncomputing devices in sales to the general public may introduce errors into sales transactions when calculations must be manually performed to verify the total price of the product; these errors increase with the use of analog devices when the quantity must sometimes be estimated and in applications where the product is offered for sale at more than one unit price; and 3) the deviation from customary practice to allow volume only dispensers would accommodate a small segment of the market; however, a significant sector that has strived to provide suitable equipment would now be placed at a competitive disadvantage.

The Western felt that this proposal is more appropriate as a user requirement; however, there was also concern that this might create a conflict with UR.3.2.(a)(1) and (2), which appear to address noncomputing devices. Consequently, the Western moved this item to informational status on its agenda until further study could be conducted on the issue.

The Committee was persuaded that this was more of a user requirement than a specification based on comments from California and the Gasoline Pump Manufacturers Association (GPMA) concerning the inability of manufacturers to control the end use of a device. Comments from industry and field officials during the Committees deliberations indicate that volume only dispensers are already in operation at many marinas, airports, and liquified petroleum gas applications; there was opposition from weights and measures officials and industry to requiring full computing type devices in these locations. The Committee noted the effective dates for similar device applications, such as found in paragraph UR.3.3.(b) (which states that a computing device shall be used only for sales for which it can compute and display the unit price). The Committee believes that it is appropriate to align the effective dates of the proposal with these requirements.

After extensive review of the issue, the Committee is withdrawing this item because it believes that this is a jurisdictional problem which should be addressed at the local level. Additionally, the Committee heard comments from industry and weights and measures official expressing concerns about including specific exemptions for marinas and airports, since these businesses are considered direct sales applications and are using full computing dispenser in many jurisdictions. There was concern that the list of exemptions may be expanded based on the justification heard to exempt marinas and airports.

330-5 W Nozzle Requirements for Diesel Fuel Dispensers

(This item was withdrawn.)

Source: Southern Weights and Measures Association

Discussion: Florida has recorded numerous complaints from consumers who inadvertently have delivered diesel fuel into their gasoline fuel tanks. In response to these complaints a proposal was made to the Laws and Regulations Committee (see agenda item 237-2) to require the terminal end of a diesel fuel nozzle spout to have an outside diameter of not less than 0.93 inches. The Southern Weights and Measures Association recommended that the NCWM contact automobile manufacturers to determine if all diesel fueled vehicles have storage tanks which could accommodate a 0.93 inch nozzle spout. Additionally, it was recommended that to ensure compliance at the retail station, where normal maintenance may result in many changes to a hose nozzle, this requirement should be included in Handbook 44. No specific language was recommended.

It was noted that the concept of a nozzle size requirement originated with earlier Handbook 130 requirements for leaded fuel nozzles. As noted in the Introduction Section of Handbook 44, the technical requirements within Handbook 44 are to eliminate from use devices: that give false reading; are of such construction that equipment is not reasonably permanent in adjustment; will not repeat their indications correctly; or facilitate fraud. There were numerous comments that the proposed requirement is not an accuracy or device performance issue, which *are* appropriately addressed in Handbook 44.

Some concern was expressed that there is no equivalent requirement to prevent delivery of gasoline into vehicular diesel fuel tanks. Florida indicated that it had conducted a study and found that a nozzle size requirement would not have an adverse impact on the automotive industry. The Gasoline Pump Manufacturers Association (GPMA) indicated that it would not have a problem with a larger nozzle requirement; however, it believes that, from a manufacturer's standpoint, it would be difficult to control nozzle maintenance at the field level, so this would be more appropriately addressed as a user requirement. It was also noted that customers often incorrectly select grades of product even when the product identity is conspicuously displayed or posted on the dispenser. Based on these discussions, the Committee believes that this issue is not within the scope of Handbook 44 and has withdrawn this item.

Representatives from SIGMA and API supported this item being withdrawn provided that this issue is addressed by the Laws and Regulations Committee; however, the recommendation from both groups is to permit a period of transition to meet the nozzle size requirements if this proposal is adopted by the Conference.

330-6 W UR.3.4.X. Printed Ticket; Cash-, Credit Card-, or Debit Card-Activated Retail Motor-Fuel Dispenser

(This item was withdrawn.)

Source: Carryover Item 330-5

Discussion: The Committee considered the following recommendation to establish requirements for a recording element and the specific transaction information to be recorded by retail motor-fuel dispensers which accept cash, credit cards and debit cards. The NTETC Measuring Sector has required a receipt for some time for card- and cash-activated retail motor-fuel dispensers. The existing criteria in Publication 14 for evaluation of cash-operated systems addressed attended locations only.

> UR.3.4.X. Ticket Requirement. - A device which is activated by accepting bank cards and/or cash shall be equipped with a ticket printer. Except for fleet sales and other price contract sales, a printed receipt providing the following information shall be available for all transactions:
>
> (a) the total volume/quantity of the delivery,
> (b) the unit price,
> (c) the total computed price,
> (d) the product identity by name, symbol, abbreviation, or code number,
> (e) the date of the transaction,

(f) the identity of the seller, and
(g) except for cash-activated sales, the identity of the purchaser

Weights and Measures officials indicate that consumer complaints result when there is no record of the transaction to compare with the credit card company billing statement. In the event of a cash transaction, the consumer has no record to verify any portion of the transaction.

The S&T Committee acknowledged that the requirement for a record of sales information at card-activated dispensers installed at unattended locations had not been addressed. The absence of an operator in unattended locations hinders the resolution of monetary discrepancies for the customer. It was suggested that the proposed requirements be incorporated into paragraph S.1.6.7.; however, it was pointed out that other codes such as the Vehicle-Tank Meters Code, include similar ticket requirements for tickets and invoices in the "User Requirements."

Comments received during the 1996 NCWM Interim Meeting from GPMA and a weights and measures representative, indicate that this requirement should apply to all installations regardless of whether the acceptor is attended or unattended. The Committee also heard a recommendation to include an additional requirement to identify the specific dispenser in the recorded information. Based upon suggestions made at the Interim Meeting, proposed modifications to paragraph (a) should cover any quantity of product delivered in alternative fueling operations.

Based upon its review of this issue at the 1996 Annual Meeting, the Committee considered that the requirements in UR.3.4.1. should be consistent with the criteria in NCWM Publication 14 (NTEP Checklist). Consequently the list of parameters required to be printed were expanded to include date, identity of the seller, and in the case of credit sales, the purchaser. The Committee also discussed the possibility of addressing these issues by modifying S.1.6.7. rather than UR.3.4.X.; however, the Committee did not believe that it was appropriate to modify a different section of Handbook 44 without circulating the issue before the regional weights and measures associations and industry. Discussions during the Annual Meeting concluded without a clear consensus on the wording in the paragraph and the item was given "Informational" status. The Committee encouraged input on this issue from the regional associations and from manufacturers and users of the equipment.

The Northeastern Weights and Measures Association supported the proposal as written.

The Southern Weights and Measures S&T Committee believes that it is appropriate that the Conference address the concerns over the lack of transaction information. However, it feels that modifications to UR.3.4. may impact older devices and consequently withdrew this item from its agenda. The Southern recommended that this issue be addressed separately as part of paragraph S.1.6.7 as suggested by the Western; however, it feels that only the four original requirements, (a) through (d), for the sales information should be retained.

The Gasoline Pump Manufacturers Association (GPMA) concurred with the recommendation from the National Type Evaluation Technical Committee (NTETC) Measuring Sector that the issue of receipt information be addressed as a specification. Consequently, it asked that this item be withdrawn. It was also noted that banking guidelines and federal regulations for credit card and debit card purchases require buyer information and date of the transaction on the recorded receipt, therefore (e), (f), and (g) should not be included the paragraph. Some concern was expressed over the availability of paper for receipts; however, it was felt that G-UR.3.2. Associated and Nonassociated Equipment addresses the performance of this equipment. The Committee also agreed with the NTETC interpretation that cash acceptors are required to provide information regarding the monetary amounts tendered or returned when a transaction is terminated. The Committee felt that the proposed changes to address recorded receipt information are more appropriately addressed as a specification code not a user requirement under Item 330-2, therefore, the Committee is withdrawing this item.

Vehicle-Tank Meters Code

331-1 W S.3.6. Antidrain Valve

(This item was withdrawn.)

Source: Northeastern Weights and Measures Association

Discussion: The Committee considered the following recommendation:

> S.3.6. Antidrain Valve. - In a wet-hose, pressure-type device, an effective antidrain valve shall be incorporated in the discharge valve or immediately adjacent thereto. The antidrain valve shall function so as to prevent the drainage of the discharge hose. However, a device used exclusively for both fueling and defueling aircraft may be of the pressure type without an antidrain valve.

The Northeastern believes that the proposed change to paragraph S.3.6. will clarify that a device used for fueling only, must have an antidrain valve, whereas a device which operates to both fuel *and* defuel aircraft is not required to have an antidrain valve.

Initially the Committee heard recommendations to further modify the proposal by changing the term "valve" to "means" to reflect the current Handbook 44 terminology, and to remove the word "exclusively" from the requirement because it created confusion over which operation was granted an exemption.

Comments heard during the Annual Meeting from one weights and measures jurisdiction indicate that the paragraph is ambiguous without clarification that the exemption from the required antidrain valve applies only to operations which both fuel *and* defuel aircraft. This jurisdiction asked that the item be given informational status due to ongoing legal proceedings which may cause them to revisit this issue.

While the Committee appreciates the concerns raised, the Committee feels that the existing language is adequate and has been fairly well understood. The Committee does not feel that adequate justification has been provided for modifying the paragraph, consequently, it is withdrawing this item from its agenda.

Liquefied Petroleum Gas and Anhydrous Ammonia Liquid-Measuring Devices Code

332-1 I N.4.1. Normal Tests

Source: Central Weights and Measures Association

Discussion: The Committee recommends that the following proposal be given informational status:

> N.4.1. Normal Tests. - The "normal" test of a device shall be made at the maximum discharge flow ~~rate that may be anticipated~~ developed under the condition of installation. Any additional tests conducted at flow rates down to and including one-half the sum of the maximum discharge flow rate and the rated minimum discharge flow rate shall be considered normal tests.

The Central notes that the current language in paragraph N.4.1. generates confusion over which device flow rate is necessary to perform a "special" test, thus causing a lack of uniformity in the performance of test procedures. The changes to paragraph N.4.1. make the test procedure more consistent with similar Handbook 44 test procedures, such as paragraph N.4.1. Normal Tests in the Liquid-Measuring Devices Code.

The comments received by the Committee indicate limited private and public sector support for this proposal. This proposal also generated 1) questions about the flow rates which appear to be affected by the size of the discharge hoses when there are two or more delivery outlets; 2) additional comments concerning confusion over the wording and inconsistencies with other code requirements; 3) cautions over installation-dependent factors which may cause devices to operate below the manufacturer's intended minimum flow rate; and 4) whether or not there should be some clarification or a definition for the terms "Slow Flow" and "Special Test" in the Liquefied Petroleum Gas and other code sections.

It was noted that the paragraph should contain language to describe where the minimum flow rate starts. Based on the comments received and the questions raised, the Committee believes that this proposal needs further study to determine if it can be demonstrated that there are widespread inconsistencies in how this requirement is being applied. Consequently, the Committee is maintaining this item on its agenda to allow for further study.

332-2 W N.4.2.2. Retail Motor-Fuel Devices (a) and (b)

(This item was withdrawn.)

Source: Central Weights and Measures Association

Discussion: The Committee has given the following proposal informational status:

N.4.2.2. For Other Retail Devices. - A retail device other than a motor-fuel device shall be tested at ~~a~~ the minimum discharge rate of:

~~(a) the minimum discharge rate that can be developed under the condition of installations, or~~

~~(b) the minimum discharge rate marked on the device, whichever is greater.~~ marked on the device. The device shall not operate below the marked minimum discharge rate.

(Amended 1973 and 1997)

The Central believes the language in N.4.2.2. is ambiguous, thus creating confusion and nonuniformity in the determination of whether it is necessary to perform tests at or below the stated minimum discharge rate and if it is permissible to allow a device to operate below the stated minimum discharge rate. The Central cites that in 1973 the NCWM, in response to devices which under certain conditions of installation were capable of operating below the marked minimum flow rate, adopted N.4.2.2. to address this issue. The NCWM noted that installations which permitted these devices to operate at rates below the manufacturer's marked minimum discharge did not meet G-UR1.1. Suitability of Equipment requirements. The Central also recommends that if it was the intent of the NCWM to require testing at the marked minimum discharge rate then the S&T Committee should further clarify this requirement.

The Committee received a variety of comments on this proposal; most indicated that it was too restrictive and difficult to enforce, and would be more appropriately addressed as a user requirement. The Natural Propane Gas Association indicated that it is uncertain if the manufacturer is capable of ensuring that a device will not operate below its marked minimum flow rate. At this time, the Committee believes there is insufficient information to support this proposal. The Committee concurs with the 1973 Conference opinion that a device should not be tested at a flow rate less than the minimum marked on the meter and that if the conditions of installation are such that the meter is operated at a lower rate, then the meter, under G-UR.1.1. Suitability of Equipment, is not suitable for that use. The Committee encourages the regions to conduct further study to determine if they are encountering problems with this issue, which warrant modification to paragraph N.4.2.2.

332-3 VC T.3. Repeatability

(This item was adopted as part of the consent calendar.)

Source: Central Weights and Measures Association

Recommendation: The Committee recommends the following proposal for a vote:

T.3. Repeatability. - When multiple tests are conducted at approximately the same flow rate, the range of the test results for the flow rate shall not exceed 40 percent of the ~~applicable tolerance~~ absolute value of the maintenance tolerance and the results of each test shall be within applicable tolerance. This tolerance does not apply to the test of the automatic temperature compensating system.
(Added 1992) (Amended 1997)

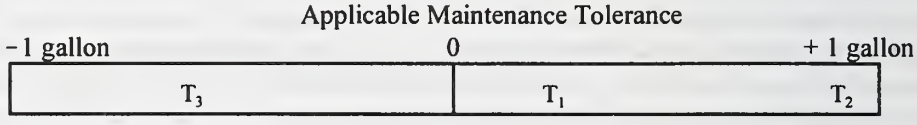
Discussion: The Central noted that the current language in paragraph T.3. Repeatability does not give a clear indication of how to apply this tolerance to the individual tests results. The intent of the proposed wording is to clarify the application of the tolerance and to change the basis of the tolerance application from "applicable tolerance" to "absolute value" of the applicable tolerance. The Central believes that this change would ensure uniformity in the application of tolerances to test results. Additionally, the Central recommends that this modification be made to paragraph T.4. in the Vehicle-Tank Meter Code Section.

The Committee received no unfavorable comments on the proposed code and supports this item.

The Committee was asked to provide an example of how this paragraph would apply to test results. This example is based on meter indications of a 100 gallon delivery for each of three test runs taken at approximately the same flow rate and a maintenance tolerance of one percent with the following results:

TEST	METER INDICATION	ERROR	MAINTENANCE TOLERANCE In % (percent)	MAINTENANCE TOLERANCE In Gallons
1	100.0 gal	+ 0.2 gal	± 1.0 %	± 1.0 gal
2	100.0 gal	+ 1.0 gal	± 1.0%	± 1.0 gal
3	100.0 gal	- 0.6 gal	± 1.0%	± 1.0 gal

Calculation of the "Applicable Tolerance":
The applicable tolerance for the ***individual*** results is the whole range of plus or minus one percent (± 1.0 %) which is equivalent to plus or minus one gallon (plus or minus 231 cubic inches) and is depicted in the diagram below. (Tests 1, 2, and 3 are designated as T_1, T_2, and T_3, respectively.)

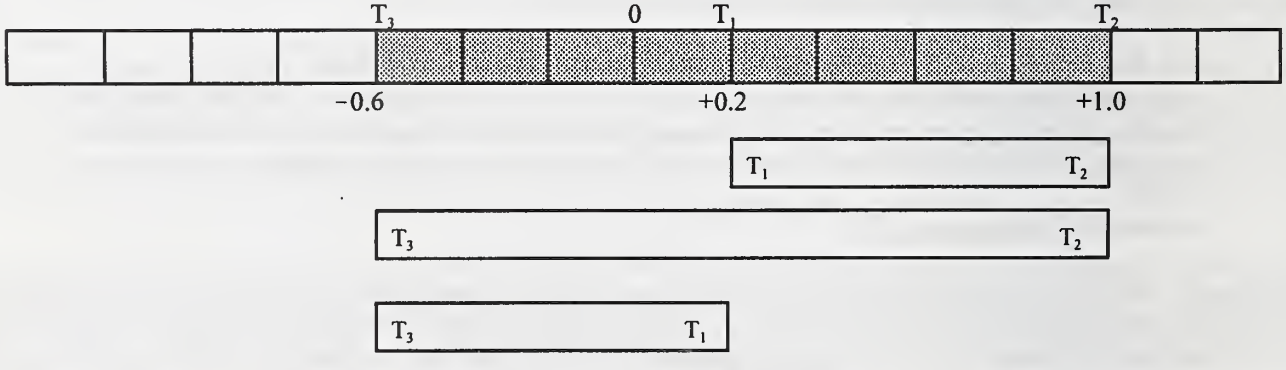


All of the individual test results are within the applicable tolerance.

The "applicable tolerance" allows indications from -1 gallon to +1 gallon for a total range of 2 gallons. In some codes (e.g., Section 3.30 paragraph T.2.3.3., and Section 3.31 paragraph T.4.,) the repeatability tolerance is based on the "applicable tolerance" as calculated above; in such a case the results of the individual tests could differ by the amount of the "applicable tolerance." In the case of paragraph T.3., however, the repeatability tolerance is 40 percent of the **absolute value** of the "maintenance tolerance" as shown in the calculations below.

Applying the "Repeatability Tolerance" T.3.:
As stated in T.3. the range of the test results shall not exceed 40 percent of the absolute value of the maintenance tolerance. The maintenance tolerance is ± 1% based on paragraph T.2. Tolerance Values. The absolute value of a number is equal to that number without the "+" or "-" signs; hence the absolute value of maintenance tolerance in this case is 1 percent. Thus, 40 percent of the absolute value of maintenance tolerance is 40 percent of 1 percent. In our example of a test draft of 100 gallons, the repeatability tolerance is calculated as follows:

0.40 x 0.01 = 0.004 or 0.4 percent of the indicated 100 gallons delivered
So the allowable range is 0.4 gallons or 92.4 cubic inches



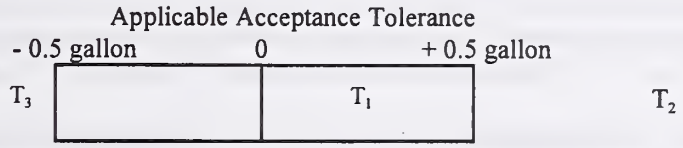
The range between Test Run 1 and Test Run 2 (T_1 to T_2) results is 0.8 gallons or 184.8 cubic inches
The range between Test Run 2 and Test Run 3 (T_3 to T_2) results is 1.6 gallons or 369.6 cubic inches
The range between Test Run 1 and Test Run 3 (T_3 to T_1) results is 0.8 gallons or 184.8 cubic inches

Although the individual test results are within applicable tolerances, the range of the multiple test results exceeds the allowable repeatability tolerance limits in all three comparisons noted above.

If we consider an example of how to apply T.3. when the acceptance tolerance is applicable for the individual results; however, the allowable range of the test results for multiple tests conducted at approximately the same flow rate shall not exceed 40 percent of the absolute value of the maintenance tolerance.

TEST	METER INDICATION	ERROR	ACCEPTANCE TOLERANCE In % (percent)	ACCEPTANCE TOLERANCE In Gallons
1	100.0 gal	+ 0.2 gal	± 0.5 %	± 0.5 gal
2	100.0 gal	+ 1.0 gal	± 0.5%	± 0.5 gal
3	100.0 gal	- 0.6 gal	± 0.5%	± 0.5 gal

Calculation of the "Applicable Tolerance":
The applicable tolerance for the ***individual*** results is the whole range of plus or minus one half-percent (± 0.5 %) which is equivalent to plus or minus one half-gallon (plus or minus 0.5 gallons or 115.5 cubic inches) and is depicted in the diagram below. (Tests 1, 2, and 3 are designated as T_1, T_2, and T_3, respectively.)



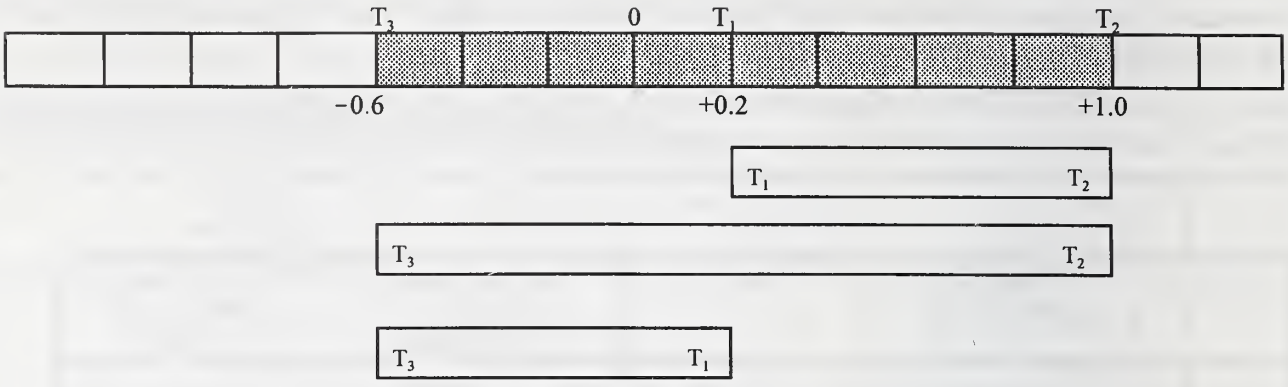
Only individual test result T_1 is within the applicable tolerance.

The "applicable tolerance" allows indications from - 0.5 gallon to + 0.5 gallon for a total range of 1 gallon. In some codes (e.g., Section 3.30 paragraph T.2.3.3., and Section 3.31 paragraph T.4.,) the repeatability tolerance is based on the "applicable tolerance" as calculated above; in such a case the results of the individual tests could differ by the amount of the "applicable tolerance." In the case of paragraph T.3., however, the repeatability tolerance is 40 percent of the **absolute value** of the "maintenance tolerance" as shown in the calculations below.

Applying the "Repeatability Tolerance" T.3.:
As stated in revised paragraph T.3. the range of the test results shall not exceed 40 percent of the absolute value of the maintenance tolerance. The maintenance tolerance is ± 1% based on paragraph T.2. Tolerance Values. The absolute value of a number is equal to that number without the "+" or "−" signs; the absolute value of maintenance tolerance in this case is 1 percent. Thus, 40 percent of the absolute value of maintenance tolerance is 40 percent of 1 percent. In our example of a test draft of 100 gallons, the repeatability tolerance is calculated as follows:

0.40 x 0.01 = 0.004 or 0.4 percent of the indicated 100 gallons delivered

So the allowable range is 0.4 gallons or 92.4 cubic inches



The range between Test Run 1 and Test Run 2 (T_1 to T_2) results is 0.8 gallons or 184.8 cubic inches

The range between Test Run 2 and Test Run 3 (T_3 to T_2) results is 1.6 gallons or 369.6 cubic inches

The range between Test Run 1 and Test Run 3 (T_3 to T_1) results is 0.8 gallons or 184.8 cubic inches

Although the range of the multiple test results is held to 40 percent of a larger tolerance, maintenance tolerance (based on revised paragraph T. 3.), the error for the range for all three test runs exceeds the allowable limits.

During the Open Hearing at the 1997 Annual Meeting, the Committee heard comments that the proposed repeatability tolerance is too restrictive in some cases. The Committee modified the proposal to indicate that the range of the test results shall not exceed 40 percent of the absolute value of the maintenance tolerance, *not* the applicable tolerance.

332-4 V T.4. Automatic Temperature-Compensating Systems

(This item was adopted.)

Source: Carryover Item 332-2

Recommendation: Modify paragraph T.4. to change the difference between the meter error from 0.5 and 0.25 percent to 1.0 and 0.5 percent, respectively, for mechanical and electronic automatic temperature-compensating systems.

> **T.4. Automatic Temperature-Compensating Systems. - The difference between the meter error (expressed as a percentage) for results determined with and without the automatic temperature compensating system activated shall not exceed:**
>
> **(a) ~~0.5~~ 1.0 percent for mechanical automatic temperature compensating systems; and**
>
> **(b) ~~0.25~~ 0.5 percent for electronic automatic temperature compensating systems.**
>
> **The delivered quantities for each test shall be approximately the same size. The results of each test shall be within the applicable acceptance or maintenance tolerance .**
> **(Added 1991) (Amended 1992, ~~and~~ 1996 and 1997)**

Discussion: In the past, the NCWM adjusted the tolerances proportionately relative to the meter tolerances for both compensated and uncompensated types of applications. The original intent was to limit the amount of error in an automatic temperature compensating system without creating a separate test on the temperature probe. This established error was equivalent to an acceptable corresponding temperature error in the temperature probe. In 1992 the Committee adopted tolerances which aligned Handbook 44 with Canadian and OIML requirements. These new tolerances were tighter, reflecting the more stringent Canada/OIML requirements for temperature sensors.

Comments submitted to the Committee at the July 1996 Annual Meeting by weights and measures officials did not indicate a clear consensus on the ability of these devices to attain the tolerances in T.4. In its review of this item the Committee considered the device performance characteristics and that the performance of the device is operator-dependent. The

Committee also discussed a suggestion made at the 1996 Interim Meeting to use a single, tighter tolerance for both mechanical and electronic automatic temperature compensating systems. However, the Committee anticipates that mechanical devices may have difficulty in meeting the tighter tolerances, and a single tolerance for all devices would, therefore, not be practical.

During the 1996 NCWM Annual Meeting, Maryland Weights and Measures reported that its records indicate a 100 percent increase in the failure rate for liquefied petroleum gas liquid-measuring devices after the implementation of the 0.5 and 0.25 percent requirement. In addition, Maryland noted that the unstable nature of the product propane and the inherent uncertainties within the testing procedure make these tolerances too stringent. The example cited was a test using a 100-gallon standard with meter errors of +0.3 gallons and -0.3 gallons for temperature-compensated tests; these runs would meet the acceptance tolerance for a normal test ($\pm$0.6 percent or $\pm$0.6 gallons), but would fail T.4.

The Committee had moved this item to "Informational" status in its 1996 Report based on the lack of consensus at the Annual Meeting and on the commitment of Maryland, California, and other participating states to determine what factors contribute to higher rates of noncompliance with paragraph T.4..

The Northeastern Weights and Measures Association proposed withdrawing this item pending further evidence which demonstrates that devices are unable to meet the existing tolerances. The Western Weights and Measures Association gave the item informational status.

During the 1997 NCWM Interim Meeting, Maryland indicated that additional study and testing completed since it last reported to the NCWM in July 1996 indicates a 59 percent increase in the noncompliance rate of devices which continue to be held to the more stringent tolerances. Based upon the additional data submitted by Maryland, the Southern noted that some additional work may be done in conjunction with this proposal, and it is amenable to considering this new data; however, the Southern emphasized a desire to bring this issue to a quick resolution. Therefore, the Southern believes that this item should be given voting status while the additional study is being completed.

At the 1997 Interim Meeting Maryland and California reported recently completed additional study and testing on the performance of the Automatic Temperature Compensating Systems. Both states endorse the proposal as written based on the results of those studies, which indicate that the earlier tolerances should be reinstated. The Committee heard further support for this proposal from industry. Given the most recent support for this proposal the Committee recommends it move forward as a voting item.

At the 1997 Annual Meeting, the Committee again heard a recommendation to specify a tolerance of 0.5 percent error for both mechanical and electronic systems; however, based on information obtained in the study conducted by Maryland and California, the Committee believes that the proposal is appropriate as presented, and that devices should not all be held to a single tolerance.

Mass Flow Meters Code

337-1 VC A.1. Application - Liquids and S.1.3.1 Units of Measurement; Volume Units of Measure

(This item was adopted as part of the consent calendar.)

Source: Southern Weights and Measures Association

Recommendation: Amend A.1 Liquids and S.1.3.1 Units of Measurement to read as follows:

A.1. Liquids.- This code applies to devices that are designed to dynamically measure the mass or mass and density of liquids. It also specifies the relevant examinations and tests that are to be conducted.

S.1.3.1. Units of Measurement. Deliveries shall be indicated and recorded in grams, kilograms, metric tons, pounds, tons, and/or liters, gallons, quarts, pints and decimal subdivisions thereof. The indication of a delivery shall be on the basis of apparent mass versus a density of 8.0 g/cm3. The

volume indication shall be based on the mass measurement and an automatic means to determine and correct for changes in product density.
(Amended 1993 and 1997)

Discussion: Schlumberger Industries and Micro Motion Incorporated submitted proposals to the Southern Weights and Measures Association to amend paragraph A.1. and S.1.3.1. to include volume units of measurement. Schlumberger proposed that the application include language which covered "volume," whereas Micro Motion indicated that it was appropriate to address "mass and density." The Southern Weights and Measures Association supports the concept of permitting volume units to be displayed on mass flow meters and the Micro Motion proposed modification to paragraph A.1; however, the Southern is concerned that adequate displays be required to enable the weights and measures officials to perform testing on these devices. Consequently the Southern recommends that additional steps be taken concurrently by the S&T Committee to propose further changes to Handbook 44 which would require appropriate displays for use during test.

Schlumberger indicates the Coriolis mass flow meter is an accurate densitometer and temperature measuring device. The device determines the volumetric measurement by dividing the mass measurement by the density measurement. Additionally, Schlumberger notes that the volume measurement is not affected by product viscosity or temperature because there are no internal moving parts, thus eliminating slippage. Schlumberger has indicated that the determination of volume with the mass flow meter is a concept that has been recognized and approved for LPG, anhydrous ammonia, refined petroleum products, aviation fuels, liquid fertilizer, and lube oil in other countries.

Prior to the Interim Meeting, the Committee heard opposition to the proposal based on concern about the ability of the apparent mass density of 8.0 g/cm^3 to yield the correct inferred volume at elevations other than sea level without the application of correction factors. It was noted that metering occurs in true mass; however, volume is indicated in apparent mass which results in a bias of approximately 0.1 percent.

Micro Motion believed that a means should be made available to determine density if these devices operate only in the volume mode. Discussions indicate that mass flow meters are calibrated with air and water as the test medium. Density is then determined by using specific calibration factors based on an established density curve for these two mediums. Additionally, it was noted that mass flow meter technology monitors density through the effects of temperature on volume in a fashion similar to that of a turbine or positive displacement meter. It was noted that mass flow meter technology operates on an inverse relationship of density to the frequency of the sinoidal waves created in the oscillation of the product flow past the tube sensors.

Other discussions focused on concern over the status of devices with current National Type Evaluation Program (NTEP) Certificates of Conformance and a verification process to ensure their accuracy and repeatability if they are permitted to indicate in volume units of measurement. The Committee heard questions concerning whether or not it could be demonstrated at the field level that Coriolis type mass flow meters accurately measure in units of volume.

Measurement Canada reported these devices are tested in Canada in both the mass and volume mode when a system is capable of indicating in both mass and volume units of measure.

At the Interim Meeting, the Committee heard presentations on mass flow system indication in volume units of measurement from Mike Keilty (Micro Motion) and André Noel (Schlumberger). Based upon comments heard at the Interim Meeting, which indicate that volume measurement is dependent on product density, the Committee agreed to continue in its support for the Micro Motion proposal, which includes product density.

The Committee asks that the Measuring Sector of the National Type Evaluation Technical Committee work to develop guidelines for field officials to use in testing mass flow meters with volume indications and those with dual (mass and volume) indications. These guidelines should address the type of standard and mode of indication that should be used during the testing of these devices.

337-2 VC S.3.6.(b) Automatic Density Correction; Volume-Measuring Devices

(This item was adopted as part of the consent calendar.)

Source: Southern Weights and Measures Association

Recommendation: Modify S.3.6.(b) Automatic Density Correction on Volume-Measuring Devices as follows:

S.3.6. Automatic Density Correction

(b) ***Volume-measuring devices with automatic temperature compensation used to measure natural gas as a motor vehicle engine fuel shall be equipped with an automatic means to determine and correct for changes in product density, ~~both for~~ due to changes in the temperature, pressure, and composition of the product.***
[Nonretroactive as of January 1, 1995. To become retroactive as of January 1, 1999.]
(Amended 1994 and 1997)

Discussion: The Southern Weights and Measures Association submitted this proposal after reviewing a proposal from Hoffer Flow Controls to delete S.3.6. Automatic Density Correction on Volume-Measuring Devices from Handbook 44. Hoffer Flow Control's position was that neither a direct mass flow meter or an inferred mass flow meter is capable of determining composition of a gas without the use of a gas chromatograph or similar type of analytical equipment which can make qualitative and quantitative determinations of the components that makeup a gas.

The Southern believes that there are some misinterpretations of this paragraph relating to the use of the term "composition." The Southern noted that paragraph S.3.6. recognizes that product density can vary with changes in product composition and with changes in product temperature. Any changes in product density can affect the accuracy of the meter, thus these devices must be equipped with a means to automatically correct for changes in product density. Manual entries of product density are not sufficient to compensate for changes in density which may vary with changes in the supply of product. Based on its review of past NCWM S&T reports the Southern believes the use of the term "composition" was not intended to require a device to automatically monitor changes in the qualitative properties of the gas; the requirement for monitoring changes in product density relates only to the subsequent impact on the measurement determination. Therefore, the Southern does not believe it is appropriate to delete the word "composition" and recommends as an alternative that the focus of the changes to S.3.6. should be to clarify the concerns which have been raised. The Southern notes that it heard additional comments that pressure may also affect product density and recommended that the S&T Committee study whether or not the term "pressure" should be added to S.3.6.

During the open hearing session at the Interim Meeting, comments were heard that indicate other influence factors (in addition to temperature and composition) may affect product density. Based on this information, the Committee recommends that the term "pressure" be added to paragraph S.3.6. to require that these systems have an automatic means to determine and correct for changes in product density due to changes in "pressure." The Committee recommends that this requirement be revisited as new technologies are developed that indicate other influence factors affect product measurement in these systems.

The Committee heard comments from one manufacturer of an indirect mass flow meter that this item should be made informational until it completes research on these measuring systems. The Committee acknowledged that the study in progress and noted that it may revisit this issue when the study is complete on the effects of product composition.

337-3 I UR.3.7. Return of Product to Storage - Compressed Natural Gas Dispensers

Source: Carryover Item 337-1

Discussion: The Committee is considering the addition of a user requirement for CNG dispensers as shown below:

UR.3.7. Return of Product to Storage, Retail Compressed Natural Gas Dispensers.- Provisions shall be made for returning product to storage during testing operations.

At the 1997 Annual Meeting, it was noted that the Committee awaits direction from the CNG industry on the handling of product after testing. Concern was expressed over who will be the responsible party in handling this product, especially in the event of a mishap. It was suggested the possible focus of this issue should be to safely dispose of the product.

The Committee is maintaining this item as informational with the understanding that the Natural Gas Vehicle Coalition (NGVC) will come back to the S&T committee with a definitive proposal by the end of July 1997. The Committee expressed its intention to move the item to voting status on its 1998 agenda based upon its continued concerns over the safe disposal

of product after testing and the need to enable testing to facilitate use and implementation of these alternative fueling devices. Background information on this issue is listed below for reference.

Background: In 1994, the NCWM adopted requirements to address the sale and delivery of compressed natural gas (CNG). At that time the Laws and Regulation Committee suggested that a user requirement be added to Handbook to include provisions for returning product used in testing to storage at all retail CNG locations. Weights and measures officials now encounter installations without a way to return product to storage once cylinders have been filled during the testing process. In some cases, device owners and service persons vent the product into the atmosphere to empty the cylinder used in the testing process. Weights and measures officials have expressed concern over the safety and environmental impact of the practice; however, there are no Handbook 44 requirements to address return of product to storage. The L&R Committee noted that the Environmental Protection Agency has no specific regulation requiring the return of CNG test product to storage, although air quality can be preserved only by eliminating venting to the atmosphere. Initial discussions with the Natural Gas Vehicle Coalition indicates that similar concerns may be shared by their members and that no significant opposition to such a proposal is anticipated.

At the 1995 Annual Meeting, the Committee recognized that the return of CNG to storage is a safety concern to weights and measures officials and industry representatives, therefore, the Committee felt this issue should receive priority status. It also felt that technology already exists to permit return of CNG product after completion of the testing process. The method for return of product should be determined by the user. Because the Committee was unanimous in its concern for this requirement, it recommended this become a retroactive requirement.

The 1995 NCWM Annual Meeting concluded with recommendations from industry and weights & measures officials that additional study was needed to identify how the product will be returned to storage and what restrictions, such as pressure, might create problems in returning product to storage.

During the 1996 Interim Meetings, the Committee was advised that a subgroup from the NTETC Measuring Sector was reviewing a proposed procedure to address the return of product during the testing of compressed natural gas meters.

In June 1996, the Natural Gas Vehicle Coalition (NGVC) sponsored a meeting to develop field test procedures for compressed natural gas dispensers and to discuss Item 337-1 on the S&T Committee's agenda. The meeting was attended by the Chairman of the S&T Committee, weights and measures officials, members of industry, and users of compressed natural gas dispensers. At that meeting, a consensus was not reached on how to address the issue of returning product to storage. It was noted that a number of possible methods exist and that different methods may be used at different installations. The group expressed particular concern about the safety issues surrounding this issue and emphasized the importance of establishing procedures which will not create environmental issues. Industry representatives in the group noted the importance of ensuring that each site is evaluated by a regulatory agency, such as the Fire Marshall's office, to ensure that all safety issues have been addressed for the specific installation. Weights and measures officials expressed concern that safety evaluations of these installations by such agencies are often delayed well past the time the devices are placed into service because of the heavy workload of these agencies. Since the NGVC's Technical Committee NGV4 had planned to meet at the end of July 1996, it was suggested that this group might be better able to refine the possible approaches to safely discharge the product after testing; since the group is very familiar with the technology and the restrictions to be addressed when working with the product.

The Committee received a letter from the NGVC in July 1996 confirming that the Coalition's Technical Subcommittee NGV4 would discuss the return to storage issue at its meeting at the end of July 1996. The NGVC committee asked the Committee to consider returning the issue to an "Informational" status pending this meeting. The NGVC believed that they could develop safe, cost-effective, and technically sound solutions for dealing with this issue from a systems approach.

The S&T Committee heard testimony from several weights and measures jurisdictions emphasizing the safety concerns surrounding this issue and the jurisdictions voiced the need to move forward as quickly as possible to prevent injury to field officials. While the Committee was reluctant to delay the issue further, the Committee was uncertain whether or not the proposed change to UR.3.7. would fully address the safety concerns as it is currently written. Consequently, the Committee decided to return the item to "Informational" status to allow the NGVC Subcommittee additional time to develop an alternate proposal. The Committee took this action with the understanding that the Subcommittee would return to the NCWM soon after their July 1996 meeting with possible solutions to be circulated among the regional weights and measures associations and possibly be included in a draft examination procedure outline for trial use by field staff.

The Northeastern and Western Weights and Measures Associations continue to support the proposal as written. The Western has kept this item as informational. The Southern Weights and Measures Association heard a presentation from Jim Pekor, Equitable Gas Company, speaking on behalf of the Natural Gas Vehicle Coalition (NGVC) concerning the work being conducted by the NGVC Technical Committee 4.9 on this issue. Mr. Pekor reported that based on work to be performed over the next several months, the Technical Committee will make recommendations to the regional weights and measures associations and the NCWM S&T Committee concerning this issue. The report was to be provided to the Committee by the 1997 NCWM Interim Meeting.

During discussions at the 1997 Interim Meeting, the Committee acknowledged the NGVC concern that the wording in the proposed paragraph UR.3.7. might be interpreted as strictly requiring CNG products to be returned to storage. The NGVC believes the proposal as written limits device operators to the most complex and expensive option for emptying test cylinders after testing has been completed. The Committee considered alternative language developed by the NGVC and one dispenser manufacturer; however, comments received during its deliberations indicate that the alternate language does not address several issues of concern, such as accessibility (operator providing special labor and equipment), responsibility, and definitive guidelines on safe discharge of product given the restrictions on venting product to atmosphere that may exist in many jurisdictions. The NGVC also suggested returning product to a vehicle; however, Weights and Measures officials noted that their internal policy and procedures prevent them from returning product to an official vehicle.

It was agreed that this issue was not fully understood during the initial phases of the Conference work on compressed natural gas retail motor-fuel dispensers. The Committee reiterates its concern over the safe discharge of CNG products and recognizes that the growth continues in the number of these installation which fall under the jurisdiction of the local weights and measures authority.

337-4 VC Changes to Section 3.37 to Correspond to Liquid-Measuring Devices Code

(This item was adopted as part of the consent calendar.)

Source: National Type Evaluation Technical Committee (NTETC) Measuring Sector

Recommendation: Add new requirements as follows to Section 3.37 Mass Flow Meters Code Section of Handbook 44 to correspond to the code sections from the Liquid-Measuring Devices Code (LMD.) The proposed requirement for hose length will be aligned with the Canadian requirement and, thus, will differ from that in the LMD Code.

S.2.5.3. Selection of Unit Price. - Except for dispensers used exclusively for fleet sales, other price contract sales and truck refueling (e.g., truck stop dispensers used only to refuel trucks), when a product or grade is offered for sale at more than one unit price through a computing device, the selection of the unit price shall be made prior to delivery using controls on the device or other customer-activated controls. A system shall not permit a change to the unit price during delivery of a product.
(Added 1997)
[Nonretroactive as of January 1, 1998]

S.2.5.4. Agreement Between Indications. - When a quantity value indicated or recorded by an auxiliary element is a derived or computed value based on data received from a retail motor fuel dispenser, the value may differ from the quantity value displayed on the dispenser, provided the following conditions are met:

(a) all total money values for an individual sale that are indicated or recorded by the system agree, and

(b) within each element the values indicated or recorded meet the formula (quantity x unit price = total sales price) to the closest cent.
(Added 1997)
[Nonretroactive as of January 1, 1998]

S.2.8. Indication of Delivery. - The device shall automatically show on its face the initial zero condition and the quantity delivered (up to the nominal capacity). However, the first 0.03 L (0.009 gal) of a delivery and its associated total sales price need not be indicated.
(Added 1997)
[Nonretroactive as of January 1, 1998]

S.7. Totalizers.

S.7.1. Totalizers for Retail Motor-Fuel Devices.- Retail motor-fuel dispensers shall be equipped with a nonresettable totalizer for the quantity delivered through the metering device.
(Added 1997)
[Nonretroactive as of January 1, 1998]

UR.3.8. Return of Indicating and Recording Elements to Zero.- On any dispenser used in making retail deliveries, the primary indicating element, and recording element if so equipped will be returned to zero before each delivery. Exceptions to this requirement are totalizers on key-lock-operated or other self-operated dispensers and the primary recording element if the device is equipped to record.
(Added 1997)
[Nonretroactive as of January 1, 1998]

UR.4. Selection Requirements.

UR.4.1. Discharge Hose.

UR.4.1.1. Length - The length of the discharge hose on a retail-motor fuel device:

(a) shall not exceed 4.6 m (15 ft) unless it can be demonstrated that a longer hose is essential to permit deliveries to be made to receiving vehicles or vessels.

(Added 1997)
[Nonretroactive as of January 1, 1998]

UR.5. Installation Requirements.

UR.5.1. Manufacturer's Instructions.-A device shall be installed in accordance with the manufacturer's instructions, and the installation shall be sufficiently secure and rigid to maintain this condition.
(Added 1997)
[Nonretroactive as of January 1, 1998]

UR.5.2. Discharge Rate.-A device shall be installed so that the actual maximum discharge rate will not exceed the rated maximum discharge rate. Automatic means of flow regulation shall be incorporated in the installation if necessary.
(Added 1997)
[Nonretroactive as of January 1, 1998]

Discussion: At the 1995 meeting of the National Type Evaluation Technical Committee Measuring Sector, the Sector heard proposed changes to the Mass Flow Meter Code which were submitted by California. The modifications were to be reviewed concurrently with the proposed Compressed Natural Gas (CNG) Retail Motor-Fuel Dispenser Checklist. A subgroup which has also agreed to review the CNG Checklist, was to study the proposed code sections, then refine and submit them to the Sector for further review and action. Based upon its review of these proposed changes at its October 1996 Meeting, the Measuring Sector supports incorporating the above code requirements as they relate to Mass Flow Meters into Handbook 44. The Sector believes that it is appropriate to include these paragraphs because they are applicable to mass flow meters used to dispense compressed natural gas as an engine fuel. The Sector acknowledged that there may be some concerns over the length of the discharge hose on these dispensers; however, it agreed that the hose length should be 15 fifteen feet, thus aligning U.S. and Canada requirements.

Comments received at the October 1996 Sector meeting indicate that the requirement proposed in paragraph UR.1.1.1. should be harmonized with the Canadian requirement of 15 feet. It was noted that the "mast-type" support for a CNG hose

necessitates a longer hose than the permissible 12-foot length. Similar recommendations were made at the June 1996 meeting of the CNG Retail Motor-Fuel Dispenser working group.

At the Annual Meeting, the Gasoline Pump Manufacturers Association (GPMA) indicated that the requirements for CNG retail motor-fuel dispensers should agree with all the operating requirements in Section 3.30 of Handbook 44 for other retail devices. It was questioned whether or not the suppression of the first 0.009 gallons of product in a delivery is acceptable for this type of dispenser. The explanation given for that practice indicates that this figure was selected because it is equivalent to the whole revolution of the least significant decade for the gallon indication. Micro Motion recommended that this requirement be stated in mass units. The Committee received a limited number of responses to the proposal and recommends inclusion of the proposal in the Mass Flow Meter Code.

Each requirement was given the appropriate paragraph designation for the applicable code section in which it is to appear. Additionally, it was recommended these new paragraphs become nonretroactive requirements.

Berry Baskets and Boxes Code

346-1 W Changes to Recognize Use of Nonrigid Containers

(This item was withdrawn.)

Source: Central Weights and Measures Association (CWMA)

Discussion: The Committee considered the following proposal to recognize the use of non-rigid containers in the Berry Basket and Boxes Code.

A.1. - This code applies to baskets and boxes for berries and small fruits in capacities of 1 dry quart and less. This code also applies to nonrigid (paper, and plastic) containers used for the sale of fruits and vegetables with a capacity of ½ bushel and less.

S.1. Units. - ~~The capacity of a berry basket or box shall be ½ dry pint, 1 pint, or 1 dry quart.~~

S.1.1. The capacity of a berry basket or box shall be ½ dry pint, 1 pint, or 1 dry quart.

S.1.2. The capacity of nonrigid containers shall be ¼ peck, ½ peck, 1 peck or ½ bushel.

S.3. Capacity Point. The capacity of a berry basket, ~~or~~ box, or nonrigid container shall be determined by its top edges.

N.1.1. Method of Test. - A berry basket or box may be tested either volumetrically, using rape seed as the testing medium, or geometrically through accurate inside dimension measurement and calculation.

N.1.1. A berry basket or box may be tested either volumetrically, using rape seed as the testing medium, or geometrically through accurate inside dimension measurement and calculation.

N.1.2. A nonrigid container may be tested geometrically through accurate inside dimension measurements and calculations.

Table 1.
Maintenance and Acceptance Tolerances
in Excess and in Deficiency

Nominal Capacity	Tolerance	
	In excess cubic inches	In deficiency cubic inches
½ pint	1.0	0.5
1 pint	2.0	1.0
1 quart	3.0	1.5
¼ peck	5.0	2.5
½ peck	10.0	5.0
1 peck	16.0	8.0
½ bushel	30.0	15.0

Ohio has determined that, in response to a consumer complaint on short volume of bagged produce, that bags used to package produce are short on capacity. Ohio has noted that there is no applicable code requirement for this type of container. Ohio also reports that the manufacturer of 80 percent of the paper containers advises that the deficiency is an acceptable industry standard; testing indicates as much as a 16-20 percent shortage on one-peck paper bags.

The inner dimensions of a paper bag or other non-rigid container can usually be verified fairly accurately through dimensional measurements when the container is empty. A bag deforms at varying degrees when it is used to package products such as apples or other large produce items,.

The Committee noted that bags of produce should be treated as packages; the packages must contain the declared quantity within the requirements of NIST Handbook 133. The Committee noted that items with large amounts of air space are customarily sold by heaped measure. The Committee also noted that labeling requirements within Handbook 130 state that containers shall contain their stated quantity of a commodity.

The Committee received a limited number of responses from weights and measure jurisdictions on the extent of short measure produce bags. A number of recommendations noted that metric units of measurement should be added to this code section. One area of concern is that testing "geometrically" may not result in an accurate determination of the capacity of these bags. Additionally, it was pointed out that testing of this type of container with standard testing materials may subject the bags to distortion and, thus, may not yield consistent, accurate findings during repeated dimensional measurements.

While the Committee acknowledged and appreciated the concerns presented in this item, the Committee does not believe that it is appropriate to recognize non-rigid containers as standard measures. The Committee believes that commodities packaged in non-rigid containers, such as those described in the proposal, should be tested as packages and, as packages, should be labeled and packaged as specified in Handbook 130 and 133.

During the 1997 NCWM Annual Meeting, Ohio indicated that it believes this is a regional problem and it plans to revisit this issue.

5.56(a) Grain Moisture Meters Code

356-1 VC S.2.5. Provision for Sealing

(This item was adopted as part of the consent calendar.)

Source: Grain Moisture Meter (GMM) and Near-Infrared Protein (NIR) Analyzer Sectors

Recommendation: Change the Provisions for Sealing for Section 5.56(a) Grain Moisture Meters as follows:
[NOTE: Section S.2.5. was previously Section S.2.3. prior to 1996 with the reorganization of the Grain Moisture Meters Code]

S.2.5. Provision for Sealing

~~(a)~~ ***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 ~~part b~~ Table S.2.5.,) before any change that affects the metrological integrity of the device can be made to any mechanism. [Nonretroactive as of January 1, 1998]***

~~**(b) If the operator is able to make changes that affect the integrity of the device (e.g., slope, bias, etc.) In normal operation, the device shall use an audit tail. The minimum form of the audit trail shall be an event logger and 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 (for calibration changes consisting of multiple constants, the calibration version number is to be used rather than the calibration constants.)**~~

~~**The device is not required to display this information, but a printed copy of the information must be available through another on-site device. The event logger shall have a capacity to retain records equal to twenty-five (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.)**~~

[Note: Zero-setting and test point adjustments are considered to affect metrological characteristics and must be sealed.]

Table S.2.5. Categories of Device and Methods of Sealing	
Categories of Device	*Method of Sealing*
Category 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.*
Category 2: Remote configuration capability, but access is controlled by physical hardware. *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 remote configuration.*	*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: Remote configuration capability access may be unlimited or controlled through a software switch (e.g., password)	*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 twenty-five (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.	*Same as Category 3.*
Category 3b: No remote capability, but access to metrological parameters is controlled through a software switch (e.g., password.)	*Same as Category 3.*

[Table Nonretroactive as of January 1, 1999.]

Discussion: During the 1995 NCWM Annual Meeting the provisions for sealing in S.2.5. were renumbered and modified to include a list of the specific minimum audit trail information; this change did not address devices with remote configuration. At its March 1996 Meeting, the Grain Moisture Meter Sector discussed an audit trail requirement for devices capable of remote configuration. The Sector heard comments from one device manufacturer stating that, from an enforcement stance, there is no difference between devices which require a seal to be broken at the device keypad and devices which can be accessed remotely without breaking a seal (e.g., via a modem or acoustic coupler) prior to changing a parameter. One consideration that was noted was the significant difference in the economics involved in choosing a device with a physical seal versus one that has sufficient memory to incorporate an audit trail. The Sector was not able to reach a consensus at its March 1996 meeting on an audit trail requirement for devices with remote configuration capability regardless of the need to break a physical seal prior to remote configuration.

The Sector discussed the methods of sealing scales and liquid-measuring devices and their possible application to grain moisture meters. It was noted that grain moisture meters may be inspected before calibration is completed for the coming harvest, thus leaving the device unsealed with no record of the changes to parameters for more than a year. A poll of the weights and measures membership on the Sector indicated a preference for sealing Category 2 devices with a physical seal or event counters.

At its September 1996 meeting, the Sector acknowledged that physical seals would not constitute a meaningful form of security on grain moisture meters if frequent bias adjustments were required, and event counters alone would not provide substantial information on the appropriateness of the adjustment. The Sector believes that grain moisture meters should either be sealed by a physical seal, or if the operator is able to make changes affecting the metrological integrity of the device,

should use an audit trail consisting of an event logger which includes an event counter, the parameter ID, the date and time of change, and the new value of the parameter (or the new calibration version number if the change consisted of multiple constants.)

The S&T Committee received additional recommendations from the Sector to modify the requirements for Category 1 from the original proposal, which did not recognize the use of an audit trail. The Committee agreed with the proposed changes and incorporated them into the recommendation as shown.

The Committee noted that the requirements for Category 2 devices allow for either displaying *or printing* event counter information. The Committee acknowledged that this is different from audit trail criteria for other types of devices. Comments indicated that this provision to display or print audit trail information might also be appropriate to add to Category 1 of Table S.2.5. The Committee asked that the GMM Sector review this issue and provide feedback to the Committee. Based upon input from the GMM Sector, the Committee may add language to the provisions of Category 1 to recognize either display or printing of the audit trail information.

Editorial Note: At the March 1997 meeting, the Grain Moisture Meter Sector decided to recommend to the S&T Committee that additional language be added to the method of sealing Category 1 devices of Table S.2.5. and also specify that the event counters for Category 1 and 2 devices be able to record from 000 to 999 events for both calibration and configuration parameters. The additional language the S&T Committee will be asked to consider for Category 1 devices reads as follows: "*If equipped with event counters, the device must be capable of displaying, or printing through another on-site device, the contents of the counters.*"

At the 1997 NCWM Annual Meeting, the S&T Committee supported the additional changes proposed by the Sector in its March 1997 meeting. In addition, the Committee supported a recommendation for further modifications to the language to allow that event counter information be displayed or printed through the device *or* another on-site device for Category 1 and 2 devices. It was also noted that it was the Sector's intent for Category 3 devices to have a capacity to retain records 25 times the number of sealable parameters.

Near-Infrared Grain Analyzers Code

357-1 VC S.2.6. Provision for Sealing

(This item was adopted as part of the consent calendar.)

Source: Near-Infrared Protein Analyzer (NIR) Sector

Recommendation: Modify S.2.6. Provision for Sealing as follows:

S.2.6. Provision for Sealing. -

~~***(a) 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 part (b),) before any change that affects the metrological integrity of the device can be made to any mechanism.***~~

~~***(b) If the operator is able to make changes that affect the metrological integrity of the device (e.g., slope, bias, etc.) In normal operation, the device shall use an audit tail. The minimum form of the audit trail shall be an event logger and 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 (for calibration changes consisting of multiple constants, the calibration version number is to be used rather than the calibration constants.)***~~

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 twenty-five (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.)

Discussion: The NIR Sector believes that changes to the method of sealing for NIR grain analyzers should correspond as closely as possible with those for grain moisture meters, since a device may be submitted for use in both applications. The Sector agreed that the sealing requirements for near infrared-type instruments should equal or exceed those specified for Category 3 devices in the Scales Code. Specifically, the Sector agreed that all NIR grain analyzers (measuring constituents other than moisture) should comply with the audit trail requirements for Category 3, 3a and 3b devices consistent with that which was proposed for Grain Moisture Meters. See agenda item 356-1 for a detailed discussion of this issue.

The Committee has received no unfavorable comments on this proposal, therefore it supports the recommendation as presented.

Other Items

360-1 W Identification of Code Sections Not Designed for Field Application

(This item was withdrawn.)

Source: Central Weights and Measures Association

Discussion: During the 1996 NCWM Annual Meeting, an emergency issue was brought before the NCWM. That issue dealt with a legal challenge to a weights and measures jurisdiction as a result of how it enforced portions of Handbook 44 intended primarily for laboratory applications and other tests to be conducted under controlled conditions. To help address this challenge, the NCWM added new wording to the *Introduction, Section 6. Using the Handbook* in Handbook 44; this wording acknowledges that some equipment design features may lend themselves only to testing in a laboratory or controlled environment, and that not all tests described in the Notes Section of Handbook 44 are required to be performed in the field as an official test.

To prevent further challenges and to clarify the optimum environment to field officials attempting to conduct inspections on the various types of device technology in commercial use, the Central believes that the appropriate code sections should contain language which declares the intended environment under which to perform tests.

No specific recommendations were submitted.

Based upon comments heard on this issue and discussion during the Interim Meetings, the Committee does not believe that the identification of code requirements for use in "laboratory" or "field" is appropriate at this time. The Committee believes that the language added in July 1996 to the Introduction to NIST Handbook 44 under *Section 6. Using the Handbook* as a result of an emergency item adequately addresses this issue. There is concern that specifically designating a test or specification as a "laboratory" or "field" test might imply that the test cannot be applied in the field or that the device is exempt from the requirement in a field installation. The Committee is also concerned that this differentiation may lead to difficulties in enforcing requirements when the specifications can realistically be applied or tests performed in the field.

360-2 I OIML Report

Prior to the 1997 Interim Meeting information was provided by Otto. K. Warnlof, Standards Management Program, NIST on OIML activities of significant importance to the NCWM. The following information is an update which was provided by Deborah M. Ripley, Standards Management Program, NIST, on OIML activities of significant importance to the NCWM. This report contains a list of the International Working Group Meetings (IWG), National Working Group Meetings (NWG),

work in process, and the Asian-Pacific Legal Metrology Forum (APLMF) activities that are of interest to NCWM members and are generally within the purview of the S&T Committee.

OIML Report
NCWM Annual Meeting - July, 1997

International Working Group Meetings

TC 9	"Instruments for Measuring Mass and Density" (responsibility U.S.), July 7-9, 1997 United Kingdom, 1st Committee Draft (CD) Revision of R 60 "Metrological regulation for load cells."
TC 9/SC 2	"Automatic Weighing Instruments" (responsibility U.K.), July 9-11, 1997 United Kingdom 2nd CD R "Automatic Road Weighbridges."
TC 8/SC 7	"Gas metering" (responsibility Belgium), January 26-28, 1998, Brussels
TC 8/SC 5	Revision of R 49 "Water Meters Intended for the Metering of Cold Water." Withdrawn in November 1996. October 1-3, 1997, Vienna, to determine direction.
OIML	32nd CIML Meeting. October 27-31, 1997, Rio, Brazil

National Working Group Meetings - 1997

TC 9	"Instruments for Measuring Mass and Density" (responsibility U.S.), March 25-26, 1997 1st CD Revision of R 60 "Metrological Regulation for Load Cells."
TC 9/SC 3	Weights (responsibility U.S.), to be announced.

Work in Process - 1997

TC 9	2nd CD Revision of R 60 to be circulated to NWG by September 1997. 1st CD Revision of Annex-A to be circulated to NWG by September 1997.
TC 9/SC 3	Proposed Draft R 111-2 Part 1: Testing Procedures For Weights and Proposed Draft R 111-2 Part 2: Pattern Evaluation Report circulate to NWG and IWG for vote and comment.
TC 9/SC 2	3rd CD R "Automatic Instruments for Weighing Road Vehicles in Motion." to be circulated by fall 1997.
TC 8/SC 5	Revision of R 49 Water Meters Intended for the Metering of Cold Water. Withdrawn November 1996.

TC 8/SC 5/WG 1 "Electronic Water Meters" has been put on hold until R 49 issues are resolved.

TC 8/SC 2	"Static Mass Measurement" (responsibility Australia). CD to be circulated to NWG for review.
TC 8\SC 6	"Measurement of Cryogenic Liquids" (responsibility U.S.), Draft Revision R 81 "Measuring Systems for Cryogenic Liquids." CD circulated to NWG for comment. Draft submitted to CIML Members for vote. "Measurement of Cryogenic Liquids" (responsibility U.S.), Draft R 81 "Measuring Systems for Cryogenic Liquids. Part 2: Test Report Format" (in development).
TC 7/SC 5	"Dimensional Measuring Instruments" (responsibility Australia). 3rd CD due for circulation in fall of 1997.

APLMF

Load Cell Intercomparison of Load Cell Testing, Working Group Meeting (responsibility Australia), July 7, 1997, United Kingdom

4th Forum Meeting, September 22 - October 5, 1997, Tsukuba, Japan
Topics: High capacity flow meters; utility meters; prepackaged articles & mutual recognition; "Train the Trainer" on OIML R 76 Non-Automatic Weighing Instruments.

Intercomparisons:
Non-automatic weighing instruments
Load Cells (to be announced)
Mass standards (to be announced)
Rice-moisture (formation of working group)

360-3 I Committee Policy and Procedures

(This item was added to the Committee's agenda as a result of discussions at the Interim Meeting.)

Source: Specifications and Tolerances (S&T) Committee

Recommendation: The Committee recommends that a policy and procedures be established for placing items on the NCWM S&T Committee agenda. The Committee is working to complete a trifold brochure and submittal form which includes information on how to introduce an agenda item to the S&T Committee; the Committee also plans to make this information available on the NCWM Fax-on-Demand System. The Committee believes this work will clearly document and expedite the process by which amendments or new provisions are added to NIST Handbook 44.

Discussion: Discussions at the Interim Meeting, by Committee members indicate a pressing need to establish some guidelines on how the Committee should accept and process items submitted for its agenda. The Committee has heard comments which indicate that many proposals on the S&T agenda may not have been fully explored to ascertain if there is a need to address those changes at a national level. Additionally, items may be presented to the Committee prior to an item undergoing all of the developmental procedures that are outlined in NIST Handbook 44 *Introduction 3. Handbook Amendments*. Based on these comments and the number of proposals it receives annually, the Committee is working to develop a policy and procedures to ensure that members of the NCWM are receiving the maximum benefits of the mechanism in place for addressing weights and measures issues and enacting changes to Handbook 44.

Ronald D. Murdock, North Carolina, Chairman

Darryl L. Brown, Iowa
Monty H. Hopper, Kern County, California
Allan Nelson, Connecticut
George Shefcheck, Oregon

Renald Marceau, Canada, Technical Advisor
Tina Butcher, NIST, Technical Advisor
Juana Williams, NIST, Technical Advisor

Committee on Specifications and Tolerances

Report of the Committee on Administration and Public Affairs

Edwin J. Price, Chairman
Director for Consumer Programs
Texas Department of Agriculture

400 Introduction

This Report of the Committee on Administration and Public Affairs (A&P) for the 82nd Annual Meeting of the National Conference on Weights and Measures consists of the Interim Report offered in the NCWM Publication 16, "Program and Committee Reports," as amended by the Addendum Sheets issued during the Annual Meeting.

Table A identifies all of the issues contained in the Report by Reference Key Number, Item Title, and Page Number. All items are informational and are indicated by the suffix **I**.

Table B lists the appendices to the report, and Table C provides a summary of the results of the voting on the Committee's report in its entirety.

Table A
Index to Reference Key Items

Table A (Continued)
Index to Reference Key Items

In addition, the Report contains several appendices that are related to specific Reference Key Numbers as follows:

Table B
Appendices

Table C
Voting Results

Reference Key No.	House of State Representatives		House of Delegates		Results
	Yes	No	Yes	No	
400 (Report in its Entirety)	41	0	58	0	Passed

Details of All Items

(In order of Reference Key Number)

401 I Regional Weights and Measures Activities

The Committee reviewed and discussed the following:

1. The final report of the Interim Meeting of the Central Weights and Measures Association (September 1996).

2. The final report of the Annual Meeting of the Northeastern Weights and Measures Association (May 1997).

3. The final report of the Administration and Public Affairs Committee to the 39th Annual Technical Meeting of the Western Weights and Measures Association Conference (September 1996).

4. The final report of the Administration and Public Affairs Committee to the 51st Annual Southern Weights and Measures Association Conference (October 1996).

5. Committee responsibilities to the regional associations were discussed.

The positions taken by the regional associations on specific items appearing in this report are noted as part of the discussion of the items. The Committee would like to thank all of the regional associations for their invaluable input and expressions of support for the work of this Committee.

402 I Program Evaluation Work Group

This working group of the A&P Committee is responsible for identifying and defining critical information that weights and measures jurisdictions should collect to show the impact of their programs and make decisions about the allocation of resources. Another objective is to achieve uniformity in data collection and inspection activities through the electronic media, allowing jurisdictions to share information through a national database. Darrell Guensler, Chairman of the PEWG, delivered a report to the Committee during the 1997 Interim Meeting. (See Appendix A for a summary of the August 1996 meeting of the PEWG.)

The PEWG has determined that the efforts of the work group cannot progress or be successful unless proper resources are made available. The resources required to support this effort exceed the amount originally estimated for the project, and NIST is unable to devote the necessary resources from its current staff.

It has been requested by the A&P Chairman that the Executive Committee take steps to secure the funding needed for this effort, using one of the following approaches:

(1) Hire a Computer Analyst/Database Administrator, under the direction of the NIST Technical Advisor, at a salary of $50,000 - $60,000 per year (this translates to an annual expenditure of $100,000 - $120,000, including benefits);

(2) Another possibility would be to hire an outside vendor. As an example, the Food and Drug Administration (FDA) has contracted with a small firm in Rockville, Maryland, to develop, house, and maintain a similar database. The first year development cost to the FDA was approximately $175,000. The yearly maintenance has been approximately $10,000 - $13,000 per year for the last 5 years.

It appears that the Executive Committee has three options available for addressing this issue:

(1) Approach NIST for a grant to provide the necessary resources;

(2) Approve the expenditure of resources by the NCWM; or

(3) Since the opportunity for success is limited without the necessary resources, the working group should be disbanded until additional resources can be devoted to the project.

The preferred option is to ask NIST to fund this effort for as long as possible. However, the National Conference on Weights and Measures should be prepared to undertake financial responsibility at some point in the future.

Further hindering the work of the group is the announcement that OWM Technical Advisor, Deborah Ripley, has been reassigned to another area within NIST. At the present time, no one on the OWM staff is available to take over the work of the PEWG.

Concluding his report, PEWG Chairman Darrell Guensler indicated his continuing commitment to the success of this project if adequate resources are provided. The State of California will proceed with implementation of a State program even if the project does not proceed on a national basis.

Going beyond automation of a national database, the A&P Committee will work with the PEWG to identify work efforts that the group can and should realistically continue in promoting uniformity in various areas, with a focus on managing barriers to developing uniformity at the local level.

403 I National Training Program (NTP)

A summary of current participation by individual jurisdictions in the NTP Certification Program is provided in Appendix B. Appendix C contains a summary of activity and information in the NTP Registry from 1985 through June 1997.

In September 1996, the National Institute of Standards and Technology (NIST) Office of Weights and Measures (OWM) added $75,000 to the remaining funds in the second training grant to the NCWM, which originally totaled $180,000. The status of the funds remaining under the second grant provided by NIST to the NCWM for the development of training materials and delivery of instructor training for weights and measures officials is as follows (as of June 30, 1997):

Net outlays to date:	$ 124,137.22
Total unliquidated obligations (money committed to contractors):	14,630.00
Total grant funds authorized ($180,000.00 plus 9/15/96 addition of $75,000.00):	255,000.00
Unobligated balance of funds: (Money available for development of training materials and delivery of instructor training)	116,232.78

During the 1997 Interim Meeting, Gilbert M. Ugiansky, Ph.D., Chief of the NIST Office of Weights and Measures and Executive Secretary of the NCWM, participated in a discussion regarding the status of carryover grant funds. The Committee is investigating options available for the most effective use of remaining grant funds. Areas under consideration include: redesign of NTP's training on scales (see Item 403-2); development of short courses, correspondence courses, interactive videos, and CD-ROMs; maintenance and updating of existing training materials; updating NCWM Publication 12, Examination Procedure Outlines (EPOs) (a contract for which is in progress); sponsoring additional instructor training courses (see Item 403-5).

403-1 I Associate Membership Scholarship Fund-Training Delivery

The Committee received a report covering the awarding of 52 $500 scholarships provided by the Associate Membership Committee (AMC) to U.S. weights and measures officials. The scholarships were authorized for use during the period August 1, 1996, through July 31, 1997. A summary of that activity is shown in Appendix D. All scholarship funds for this period were committed.

With participation from the Associate Membership Committee, the A&P Committee discussed the success of the scholarship program and explored avenues for continuing the project. The Committee expressed appreciation to the Associate

Membership Committee, as well as gratitude to all industry members for their support of the scholarship program.

The Associate Membership Committee (AMC) clearly demonstrated its commitment to the training of weights and measures personnel. During the 82nd Annual Meeting, the Associate Membership announced that it will provide 52 $500 scholarships for field training of weights and measures personnel. One $500 scholarship per weights and measures region may be used to support the publication of the association's newsletter. **All undertakings must be completed and funds paid out by July 31, 1998.**

A standard Application for Scholarship Funds, Request for Disbursement, and Reimbursement Voucher have been developed by the Committee and are in Appendix E.

403-2 I NCWM Training Courses Update and Maintenance

The Committee has adopted a plan to utilize the skills of NCWM Certified Trainers as well as outside vendors to develop, update, and perform any necessary maintenance of all NTP Training Courses and Examination Procedure Outlines (EPO's).

A major revision of existing course materials is necessary to make them consistent with the 1997 Edition of Handbook 44 and current NCWM formats and policies. The NCWM Committee on Administration and Public Affairs is now seeking proposals from individuals qualified to update these materials. The objective of this project is to revise the Inspector's (student's) Manuals and to develop the course outlines and lesson plans necessary for the guidance of instructors.

The Committee reviewed the progress made under two contracts awarded in this area. Work is currently in progress on the revision of Course No. 302, Retail Motor-Fuel Dispensers and Consoles, and EPO No. 1 on Small Scales. Proposals are sought for the update of the following courses:

Course No. 103, Introduction to Electronic Weighing and Measuring Systems,
Course No. 203, Medium-Capacity Scales,
Course No. 206, Vehicle and Axle-Load Scales,
Course No. 303, Vehicle-Tank Meters,
Course No. 304, Loading-Rack Meters,
Course No. 601, Checking the Net Contents of Packaged Goods, and
Course No. 602, Commodity Regulations.

The A&P Committee is also seeking to identify individuals qualified to develop the following new courses:

Course No. 201, Introduction to the Handbook 44 Scales Code,
Course No. 301, Introduction to Handbook 44 Liquid-Measuring Devices Code, and
Course Level No. 500 on "Other Devices" which will include linear devices, taximeters, etc.

Respondents will be asked to submit examples of their writings and illustrate their technical abilities. Interested parties should contact Joan Mindte, A&P Technical Advisor (301) 975-4003, e-mail: joan.mindte@nist.gov.

To date of this report, there has been **NO** response to the A&P's request for proposals from individuals interested in either updating existing courses or developing new training materials.

The chart which follows presents a summary of the revision status of all published NCWM course materials.

Revision Status of NCWM Training Materials
(As of June 30, 1997)

New Course Numbers (Module Numbers Appear in Parentheses)	Date of Publication	Date of Last Revision	Revision Status*	Comments
103-Intro to Electronic Weighing and Measuring Systems (27)	1/28/85	5/95	N	Revision has been completed and copies sent to the States on 5/1/95.
601-Checking the Net Contents of Packaged Goods (10)	11/29/85	9/90	R	The Committee is planning to split the course into two segments. The NCWM NIST Handbook 133 Work Group will assist in the revision of the training materials.
202-Retail Computing Scales-Electronic (1 and 2)	2/26/86	5/94	U	K. Butcher, OWM, is finalizing the update of the Inspector's Manual for changes to Handbook 44
302-Retail Motor-Fuel Dispensers and Consoles (8)	7/14/86	9/90	U	Mike Belue has been awarded the contract to update these materials.
206-Vehicle and Axle-Load Scales (5)	10/17/86	12/91	U	OWM has updated the Inspector's Manual for changes to Handbook 44. Comments are being reviewed.
303-Vehicle-Tank Meters (20)	10/31/86	12/91	N	J. Williams of OWM has completed an update of the Inspector's Manual.
205-Meat Beams and Monorail Scales (6)	4/3/87		U	Revision is underway by Jim Vanderwielen, USDA/GIPSA.
204-Livestock and Animal Scales (7)	5/27/87		U	Paul Peterson, USDA/GIPSA, has submitted a second draft of the Inspector's Manual.
305-Liquefied Petroleum Gas Liquid-Measuring Devices (21)	8/5/87		U	T. Butcher & J. Williams, OWM, have completed an update of the Inspector's Manual for changes.
203-Medium-Capacity Scales (4)	6/22/88	10/92	N	
102-Introduction to NIST Handbook 44 (24)	5/18/89	6/93	U	J. Mindte, OWM, is updating the materials for changes to Handbook 44, 1998, edition.
602-Commodity Regulations (22)	6/8/90		N	
304-Loading-Rack Meters (19)	7/18/90		N	
101-W & M Regulation in the U.S. (23)	6/14/93		N	

*Key to revision status abbreviations:

N = No revision planned in 1997
R = Revision is planned for 1997
U = Revision is underway

403-3 I Organization and Utilization of Certified Trainers

As of June 30, 1997, 11 individuals have attained the status of NTP Certified Trainers: Ken Butcher, NIST/OWM; Barbara J. DeSalvo, Ohio; Frank W. Forrest, Connecticut; Paul Peterson, USDA/GIPSA; Richard L. Philmon, Illinois; Thomas M. Stabler, STR, Inc; Richard C. Suiter, Nebraska; José A. Torres, Puerto Rico; James A. Vanderwielen, USDA/GIPSA; and Kenneth A. Wheeler, Ohio. On January 16, 1997, during the NCWM Interim Meeting, Darryl L. Brown, Iowa, was presented with a certificate recognizing him as an NTP Certified Trainer.

The A&P Committee is considering an additional candidate for Certified Trainer. This will bring the total of Certified Trainers to 12.

An educational trainer presentation videotape series consisting of four tapes and a workbook, produced by Creative Training Techniques, is available for loan on a first-come-first served basis to the NCWM Certified Trainers, and then to any trainers in the weights and measures community, again, on a first request basis. Contact Joan Mindte, (301) 975-4003, to arrange to receive the program.

403-4 I Industry Training

The Committee has identified that training is needed by industry in the areas of NIST Handbooks 133 and 44 and the NCWM Price Verification Procedure. Implementation of the NIST Instructor Training Program has provided a basis for national uniformity in these areas. The A&P Committee has been and will continue to examine the types and availability of current weights and measures courses that will meet the needs of industry. To date, more than 100 companies have participated in NIST/NCWM training in: Price Verification and Checking the Net Contents of Packaged Goods.

Organizations participating in this training include: the Pet Food Institute and The National Bark and Soil Producers Association, whose members have participated in multiple sessions of Instructional Training for Plant Managers. Eight additional classes have been requested for late 1997/early 1998. Requests have been received from the International Dairy Foods Association, the Pet Food Institute, and the American Society for Quality Control.

The Associate Membership Committee (AMC) representative will develop a process for assessing the training needs of the associate membership. The A&P Committee supports this approach and will work with the AMC in this process.

403-5 I Instructor Training

The Committee identified this method of training delivery as exceptionally successful in providing a core group of instructors capable of mentoring others. The Committee discussed the means by which this training can be provided for all areas of weights and measures activities. The individual Committee members will elicit input from each regional association in an effort to identify the specific weights and measures subject areas in which training is most needed. Classes are scheduled in the upcoming months to include: Retail Computing Scales, National Type Evaluation Program, Retail Motor-Fuel Dispensers and Consoles, NIST Handbook 133, and Price Verification. (Appendix E gives a summary of the Instructor Training activity to date.)

A secondary issue has been identified as a result of the Instructor Training Courses. There is a shortage and/or total lack of basic equipment and standards in many jurisdictions. To address this need, the NIST Office of Weights and Measures (OWM) is sponsoring an equipment/standards loan program. Equipment/standards are available on a limited basis. Jurisdictions are eligible to receive equipment/standards if at least one staff member has attended an Instructor Training Course relative to the requested equipment. The jurisdiction must agree to maintain the items in proper working condition; equipment is available on a first come/need basis. Contact Tom Coleman (301) 975-4868, e-mail t.coleman@nist.gov.

403-6 I Continuing Education Units (CEUs)

Since its inception in 1985, the NCWM National Training Program has offered Continuing Education Units (CEU's) to individuals successfully completing NTP training modules (now "courses"). One CEU is awarded for each 10 contact hours of classroom training. To date, the tracking and documentation of NTP CEU activity have been administered by the

American College Testing (ACT) Registry Service, Des Moines, Iowa. The A&P Technical Advisors have been informed that ACT will discontinue this service effective August 1, 1997.

The Committee assessed the value of the service during the 1997 Interim Meeting and explored the available options and alternatives in its discussions of the merits of continuing the CEU program. It was the consensus that there is only a limited number of weights and measures jurisdictions which award promotions and salary increases, as examples, based upon the number of CEU's attained by their staff.

Following the 1997 Interim Meeting, The American College Testing (ACT) Registry Service advised it will accept class entries up to August 31, 1997. The Committee decided not to request the funding required to acquire another outside service to track and document the award of Continuing Education Units (CEUs) to the weights and measures community. In the near future, NIST/OWM will upgrade its databases to Microsoft Access. Using this program and with the assistance of temporary staff as available, it will be possible for OWM to provide the necessary documentation to track the award of NCWM Educational Units, following the criteria of one (1) NCWM Educational Unit for each 10 hours of contact training.

404 I Legislative Strategy

During the 82nd Annual Meeting, the A&P distributed a draft of the NCWM Legislative Guideline. The document is a collaborative project of the Administration and Public Affairs and the Associate Membership Committees. The guide is designed to create a proactive presence in the minds of government leaders, is not jurisdictionally specific, and can serve as a model that can be modified by individual jurisdictions. Comments and ideas regarding the document are welcomed by the A&P. Depending upon the demonstrated value of the publication, a final version is planned for distribution during the 83rd NCWM. As a result, all State, regional, and local persons in leadership roles in weights and measures will have a tool to assist in working with legislators at all levels.

The A&P is asking for comments and ideas for improving the Legislative Guideline. Copies of the document (in limited quantity) are available on request to Joan Mindte (telephone (301) 975-4003, e-mail joan.mindte@nist.gov). Please call or write with your comments.

405 I Weights and Measures Round Tables

The individual Committee members will work with the chair of each regional weights and measures associations to assess the feasibility of conducting Round Table sessions for Weights and Measures Administrators in conjunction with regional, interim, and national conferences. A goal of the Round Table discussions is the sharing of information among the jurisdictions regarding various programs and problem-solving approaches, providing a forum for all to be heard. Once the regional has identified a possible solution to any particular problem, that approach may be shared and advanced to the national level, thus allowing for a national, uniform approach to be adopted.

406 I Public Affairs

The U.S. Constitution under the 14th Amendment states: "No State shall deprive any person of life, liberty, or property, without due process of law." The very nature of due process negates any concept of inflexible procedures universally applicable to every imaginable situation.

In the course of their work, weights and measures officials often take enforcement actions that prohibit the use of devices or sale of packaged goods (e.g., "stop sale" orders for packages and "stop-use" or "condemnation" tags issued on devices). Improper actions, (e.g., not following prescribed test procedures, enforcing labeling requirements on exempted packages, or incorrectly citing someone for a "violation") place the official or the jurisdiction in the position of being liable for the action if it results in lost business, or if it is found that the action was "illegal." In some cases the weights and measures jurisdiction can be ordered to pay monetary damages to compensate the affected party for the improper action.

Due process ensures that affected persons, against whom a finding is made or an order issued, have the opportunity to present to an independent party evidence which may be relevant in determining whether the order or finding was properly made. Due process also enables business operators to obtain an independent review of orders or findings so that actions affecting their business can be evaluated administratively instead of through costly litigation. This approach also provides

for timely review, which is essential because of the impact that such actions may have on the ability of a business to operate, and/or in cases where perishable products may be lost.

During the 82nd Annual Meeting General Session, the Committee on Administration and Public Affairs provided an educational presentation not only to explain the legal requirements of "Due Process" but to help regulatory officials with the practical application. The presentation was arranged by William J. Corey, Jr., American Frozen Foods, and given by Douglas C. Carlson, Chicago attorney with the firm of Wildman, Farrell, Allen, and Dixon. Copies of Mr. Carlson's material are available from Joan Mindte.

406-1 I Public Relations

The Committee discussed the comments and requests received for the items made available to attendees during the 81st NCWM, namely: three trifold brochures, "How to Avoid Getting Burned," "Providing Quality Services to Consumers," and "Quality Weights and Measures for Industry," as well as "Measurement in the Classroom, an Elementary School Curriculum." The regional weights and measures associations have requested that both hard copy and electronic versions of these brochures be made available to the NCWM membership.

In Chicago, during the 82nd Annual Meeting, the A&P discussed several possibilities for development into a trifold pamphlet to provide consumer information suitable as a handout or mailer. The initial title for the brochure is "Fuel for Thought, Getting What You Pay For at the Gas Station." NCWM Executive Secretary, Gil Ugiansky, agreed to provide funding for the services of a graphics expert in the design of the brochure. The A&P Committee will develop the text for the brochure. The stock and printing costs of the pamphlet will be paid by the NCWM.

During the Interim Meeting, Dave Frieders, San Francisco City/County, made a presentation to the A&P regarding his jurisdiction's Internet Home Page. Mr. Frieders also delivered an educational presentation to the 82nd Annual Meeting during the General Session which was well received. Mr. Frieder's Home Page is an interactive web site where consumers can actually lodge a complaint, secure weights and measures information, and have their individual questions answered. It is suggested that NCWM members visit the site (*http://www.ci.sf.ca.us:80/ag/*) and consider developing their own jurisdictional sites.

The Committee is seeking the assistance of the weights and measures community in the development of weights and measures informational and promotional documents. The Committee is attempting to collect a sample of every informational item that has been developed by weights and measures State and local jurisdictions. Samples requested include all items, from the elaborate annual report to the modest trifold pamphlet. By "cutting and pasting" from among these samples, the A&P Committee will develop a template format that speaks to all or parts of a weights and measures program. The items will be used by the A&P in the design of a prototype weights and measures brochure for the use of State and local jurisdictions in providing information about their programs and services. These materials will then be made available to individual jurisdictions for tailoring to their requirements.

NCWM members are asked to send copies of promotional and/or informational items to Joan Mindte, NCWM, P.O. Box 4025, Gaithersburg, MD 20885 (electronic versions may be sent via e-mail to joan.mindte@nist.gov).

406-2 I Weights and Measures Week 1998

The A&P reviewed the 1997 Weights and Measures Week activities submitted by various jurisdictions during its discussions about a theme for Weights and Measures Week 1998.

As one of its major responsibilities, the Committee will make plans for celebrating the Weights and Measures Week March 1-7, 1998. Prior to the 82nd Annual Meeting, the Committee had solicited recommendations for the 1998 theme from the individual regional associations and the weights and measures community.

After reviewing several suggestions, the theme agreed upon was: "Working Together: A Common Goal."

406-3 I Advertisement of the 82nd NCWM 1997 - Chicago, Illinois

The Committee asked each Standing Committee to submit its highest priority items prior to the 82nd Annual Meeting for circulation to industry and other interested parties. The Committee explored methods of publicizing these items by the creation of articles strategically placed in trade and other publications, as well as issuance of regional and national news releases. This coverage was designed to generate greater participation in this national forum on issues that are of a critical nature and which have a substantial impact on the marketplace, all of which is intended to market the leadership role of weights and measures.

The A&P discussed avenues available for the promotion of the 83rd NCWM in Portland, Oregon, July 12-16, 1997.

407 I Administrative Priorities and Budget

The Committee met with NCWM Treasurer, J. Alan Rogers, to discuss Committee budgetary plans for 1998 and beyond. The A&P expressed unanimous support for continuation of the instructor and industry training effort, as well as the equipment loan program, recognizing the progress toward uniformity which results from these efforts. Committee members remain united in their support of the work of the Program Evaluation Work Group. The Committee will identify additional administrative issues and plan for prioritizing and incorporating those items into its structured work plan.

Items which have been identified by the NCWM Executive Committee as appropriate for possible inclusion in the work of the A&P Committee are:

- Establishment of an Internet Home Page Subcommittee;
- NIST/NCWM Publications Status Report;
- Membership Status Report;
- Meetings, Networking with Other Associations; and
- Participation in NIST's celebration of its 100th Anniversary in the year 2001.

During the Annual Meeting, the A&P continued discussion and formulation of its long-range plan and proposed budget.

408 I Safety Information Clearing House

The Committee discussed the Incident/Accident Summaries received to date and explored the feasibility of making this information part of the national database which has been under development by the Program Evaluation Working Group (please see Item No. 402 of this report). At the present time, this information will not be included in a national listing; however, the Office of Weights and Measures will maintain an independent database of this information. Committee members continue to reinforce with their regional associations the need for placing the Incident/Accident Report form (see Appendix G of this Report) in each jurisdiction's safety reporting system, to complete this form as appropriate, and forward the information to the A&P Technical Advisors.

Edwin J. Price, Texas, Chairman

R. Greek, San Luis Obispo County, California
N. Kranker, Dutchess County, New York
B. Martell, Vermont
R. Philmon, Illinois

Industry Representative: Chris Guay, Procter and Gamble

C. Gardner, Suffolk County, New York, Safety Liaison

T. Coleman, NIST, Technical Advisor
J. Mindte, NIST, Technical Advisor

Committee on Administration and Public Affairs

Appendix A

NCWM Program Evaluation Work Group Meeting Summary Report to the Committee on Administration and Public Affairs

Darrell Guensler, Chairman
August 19-21,1996
National Institute of Standards and Technology
NIST North, Bldg. 820
Gaithersburg, Maryland 20899

The fourth meeting was held on August 19-21, 1996, at the National Institute of Standards and Technology, Office of Weights and Measures (OWM), in Gaithersburg, Maryland.

The attendees:

Mike Belue, Belue Associates
Tina Butcher, Office of Weights & Measures, NIST
Sid Colbrook, Illinois
Bill Corey, American Frozen Foods
Karen Dacres, Director's Office, NIST
Darrell Guensler, California (Chairman)
Dr. Lynne Hare, Statistical Engineering Division, NIST
Steve Malone, Nebraska
Allan Nelson, Connecticut
Ed Price, Texas
Debbie Ripley, Office of Weights & Measures, NIST
Claire Regan, Grocery Manufacturers of America (GMA)
Mike Saling, California
Randy St. John, Pennsylvania Food Merchants Association
Daryl Tonini, Scale Manufacturers' Association (SMA)
Dr. Gil Ugiansky, Office of Weights & Measures, NIST
Gilles Vinet, Industry Canada

Attachments

(Copies are available from the Office of Weights and Measures upon request)

- Listing of Members & Attendees with E-mail Address, Phone No., and Fax No.
- July 23, 1996 Letter from Industry Committee on Packaging and Labeling.
- August 8, 1996 Letter from Belue Associates.
- September 3, 1996 Memorandum from Ed Price to the NCWM Chairman.
- Copy of Federal Register Notice Requesting Public Comment on the Pilot Inspection Database Program.
- User's Guide to the Pilot Inspection Database Program.
- Response from the Food Industry Weights and Measures Task Force to the Federal Register Notice Requesting Public Comment on Pilot Inspection Database.

INDUSTRY CONCERNS

The concerns expressed by industry in the attached July 23, 1996, letter from the Industry Committee on Packaging and Labeling were discussed. The work group acknowledged the dangers of collecting biased data that may be misused. Freedom of Information Request requirements must also be considered with any data gathering projects. As the pilot proceeds, the group will work on ways to protect against improper use of the database.

MARKETPLACE EVALUATIONS

The work group agreed to conduct three evaluations over the next year to evaluate the appropriateness of conducting marketplace evaluations as part of the PEWG study. It was agreed that a retail motor-fuel device survey will be conducted before the NCWM Interim Meeting. The other two (fresh meat and fluid milk) will be done after the interim but before the annual meeting. The participating States agreed to give Debbie Ripley their station and meter populations as soon as possible. Dr. Lynn Hare (NIST) will review population counts and determine the appropriate sample size per State.

SCALE MANUFACTURERS ASSOCIATION PROPOSAL

Daryl Tonini presented a proposal from the Scale Manufacturers Association (SMA) to form a scale information database working group that would parallel the current efforts of the PEWG. SMA would like to begin by developing a data collection process for scales similar to the retail motor-fuel device data collection process.

Sid Colbrook (Illinois) and Mike Saling (California) agreed to work with SMA to develop scale criteria for the collection of data suitable for weighing devices. This will include how to handle scales with multiple components and those used for both buying and selling. A copy of the pilot retail meter criteria will be given to SMA to use as a template in developing data fields.

ROLE OF NIST

NIST's legal counsel has expressed concern regarding custodianship and administration of this activity by NIST personnel. No final decision has been rendered at this time. The work group discussed various alternatives, including NCWM hiring a Research Assistant and maintaining the database under the administration of NCWM or contracting with a third party to maintain a database management system. The FDA currently maintains a similar database system where data is collected by States and entered into a database management system run by a third party. More information will be gathered on this subject.

RESOURCES

NIST informed the work group that they do not have a sufficient number of personnel to adequately support the PEWG activity and also maintain the very important activities currently devoted to NTEP and training of weights and measures officials. In response, the group requested Ed Price to communicate with the NCWM Executive Committee via the A&P Committee regarding possible alternatives. (See attached September 3, 1996 memorandum to the NCWM Chairman.) The work group concluded that if adequate resources cannot be allocated from some source, the project should be put on hold and the work group disbanded.

NIST UPDATE ON SERVER

Tom Kurihara of NIST gave an update on the status of a server proposed to house the pilot program. The server has been ordered; however, OWM Technical Advisor's system will act as a server until all "ownership" details are worked out.

DATA COLLECTION

Because of the requirements of the Paperwork Reduction Act of 1995, a Federal Register notice was published regarding the PEWG proposal to collect data. Until that process is complete and until the NIST legal concerns are resolved, OWM cannot officially collect any data. Some data has been sent to test the system but no collection is taking place at this time. Discussions at this meeting led to some modifications of the data fields. The need for a tare description field was also identified.

Appendix B

Certification Summary

(As of June 30, 1997)

State	Total No. of Certif.	Total No. of People	Course No.										
			Mod 1*	202 Mod 2	203 Mod 4	204 Mod 7	205 Mod 6	206 Mod 5	302 Mod 8	303 Mod 20	304 Mod 19	305 Mod 21	601 Mod 10
AL	43	24		14	12	5			12				
AK	23	13		7				1	10				5
AZ	28	28		28									
AR	129	42	20	19		9		10	40	16		2	12
CO	7	7				7							
CT	86	30		19	19			2	20	3	6	2	15
DE	5	5											5
DC	4	3							3		1		
FL	100	81	6	8	3	2		7	45	7	6		16
GA	29	24				4		8	17				
HI	98	12		11	12	10	10	11	9	11	11		9
IA	1	1				1							
ID	8	8							8				
IL	17	17		8				9					
IN	67	44				17		29		21			
KS	28	15	7	7				4	1				9
LA	9	9				8							1
MD	70	37				6			27	33	4		
ME	2	3				2		1					
MA	1	1							1				
MI	42	14				12		9		14		7	
MN	15	15							15				
MO	42	39							23				19
MT	7	7				7							
NE	42	19		2		7		7	15				11
NV	13	11		1		1		1	9			1	
NH	32	8	6	5	5			2	6	8			
NM	32	22		9					13			10	
NC	39	35							20				19
ND	3	3							3				
OH	285	96		51	30	28		35	55	49		7	32
OR	54	18	16	15				5	10		1	1	6
PA	108	56		26	4	7		8	27	18			18
PR	91	49		33					33				25
SD	28	13			7			12	8				1
TN	40	29				6		5	29				
UT	71	17	16	17		4		6	15			2	11
VT	24	9	4		2	3		6	8		1		1
VI	6	6						6					
VA	3	3				1						2	
WA	21	16		5					15			1	
WI	4	4										4	
Other													
GIPSA**	48	41				29	15	6					
Totals	**1857**	**933**	**75**	**286**	**97**	**180**	**26**	**190**	**529**	**185**	**37**	**39**	**215**

* NTP Module 1 was incorporated in Module 2, now Course No. 202 (May 1994)

**USDA Grain Inspection/Packers and Stockyards Administration

Appendix C

Data as of June 30, 1997	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Annual Total	168	722	1017	760	892	953	528	309	373	290	548	236	138
Cumulative Total	168	890	1907	2667	3559	4584	5112	5421	5794	6084	6632	6874	7012

NATIONAL TRAINING PROGRAM REGISTRY
SUMMARY OF ACTIVITY

(As of June 30, 1997)

Courses Listed in Registry:

Introductory: Level 100
101 Weights and Measures Regulation in the United States
102 Introduction to Handbook 44
103 Introduction to Electronic Weighing and Measuring Systems

Scales: Level 200
201 Introduction to Handbook 44 Scales Code (planned)
202 Retail Computing Scales
203 Medium-Capacity Scales
204 Livestock and Animal Scales
205 Meat Beams and Monorail Scales
206 Vehicle and Axle-Load Scales

Meters: Level 300
301 Introduction to Meters (planned)
302 Retail Motor-Fuel Dispensers and Consoles
303 Vehicle-Tank Meters
304 Loading-Rack Meters
305 Liquefied Petroleum Gas Liquid-Measuring Devices

Measures: Level 400
Other Devices: Level 500 (linear, taximeters, etc.)

Commodities: Level 600
601 Checking the Net Contents of Packaged Goods
602 Commodity Regulations

Individuals Trained - by Course

State	Course Number															Totals
	Module 1...	Course No. 101 Module 23	Course No.102 Module 24	Course No. 103 Module 27	Course No. 202 Module 2	Course No. 203 Module 4	Course No. 204 Module 7	Course No. 205 Module 6	Course No. 206 Module 5	Course No. 302 Module 8	Course No. 303 Module 20	Course No. 304 Module 19	Course No. 305 Module 21	Course No. 601 Module 10	Course No. 602 Module 22	
AL			12	26	15	12	4		4	32						105
AK			6		7				1	16				12		42
AZ					51		30			23			25	17	1	147
AR	20		13		20		8		10	42	17		3	12		145
CA							1									1
CO							11			1				1		13
CT					31	20			2	28	6	12	2	18	26	145
DE						1	5				2			5		13
DC	4				4					3		1				12
FL	13		43	41	24	15	10		13	75	8	8		39		289
GA				7		11	4		8	17						47
HI				4	12	12	11	11	11	12	11	12		22	6	125

Individuals Trained - by Course

State	Course Number															Totals
	Module 1...	Course No. 101 Module 23	Course No.102 Module 24	Course No. 103 Module 27	Course No. 202 Module 2	Course No. 203 Module 4	Course No. 204 Module 7	Course No. 205 Module 6	Course No. 206 Module 5	Course No. 302 Module 8	Course No. 303 Module 20	Course No. 304 Module 19	Course No. 305 Module 21	Course No. 601 Module 10	Course No. 602 Module 22	
ID				8	5		19		46	12			12		10	106
IL					5	1	1		1	23				2	1	45
IN			48	48	14	46	20		42	104	44		2		27	424
IA							1	2	17	1				9	2	45
KS	9		3	8	14	14	1		5	14	2			32		107
KY	8				8	8			5	19				16		57
LA							3							1		9
ME				4		3	2		38	14			6			40
MD			6		23		1			24	38	1			4	110
MA				12	23	4			4	47	38	2	4	3	1	104
MI			94	53	50		19		38	7	22		13	29		325
MN							1			12		2	2		1	18
MS						2	3		3							8
MO		3	63	22		14	2			44				27		174
MT				8		5	2		19	6			1			37
NE		14	17	27	17	2	2	14	30	24			2	18		189
NV			11	8	1		4		4	12			1		15	35
NH	6			6	5	2			3	7	3		2			44
NJ				172	21	21				108	109					431
NM					23		19			24			13	25		92
NY					14											175
NC							2			12				19	16	57
ND				12				2		3		3	3			21
OH		38	74	107	84	47	46	4	53	100	64		10	56	12	729
OK			17	2		2			2	6				22		52
OR	18		23	16	17				3	12	19	1	29	16	12	165
PA	34		27	82	96	51	8		8	147	25		1	58	19	505
PR			38	20	32					33				24		147

Individuals Trained - by Course																
	Course Number															
State	Module 1...	Course No. 101 Module 23	Course No.102 Module 24	Course No. 103 Module 27	Course No. 202 Module 2	Course No. 203 Module 4	Course No. 204 Module 7	Course No. 205 Module 6	Course No. 206 Module 5	Course No. 302 Module 8	Course No. 303 Module 20	Course No. 304 Module 19	Course No. 305 Module 21	Course No. 601 Module 10	Course No. 602 Module 22	Totals
RI					1				1		1					3
SC					25		2			28						55
SD				10		7	10		12	8			1	10	10	68
TN				5	27		6		6	32						76
TX			5		25		8		12	24			4			78
UT	17	6	18	17	22	14	5		12	19			2	20		152
VT	6			5		3	3		9	11		1		1	2	43
VI		5							6	6			2	6		23
VA		39	9	43		24	5		16	26	25		4	38		229
WA	13		12	16	8				18	16			3		14	100
WV							3									3
WI	56		25	65	61				19	40	26		10	43		345
WY			11	3		11				16			10			51
Other																
Associate Members										6		8	3	10		30
FGIS*				13												13
GIPSA				3			28	12	2							45
Total Trained	**204**	**103**	**566**	**871**	**886**	**351**	**324**	**51**	**462**	**1256**	**448**	**54**	**179**	**703**	**179**	**6644**
Percent of Total Certified[1]	**37%**	**N/A**	**N/A**	**N/A**	**32%**	**25%**	**48%**	**61%**	**44%**	**42%**	**39%**	**56%**	**23%**	**29%**	**NA**	**27%**

* **Federal Grain Inspection Service**

** **USDA Grain Inspection/Packers and Stockyards Administration**

[1]A total of 1,857 certificates have been awarded to 933 individuals under the NTP Certification Program.

***Module 1 was incorporated in Course 202 in 1994.

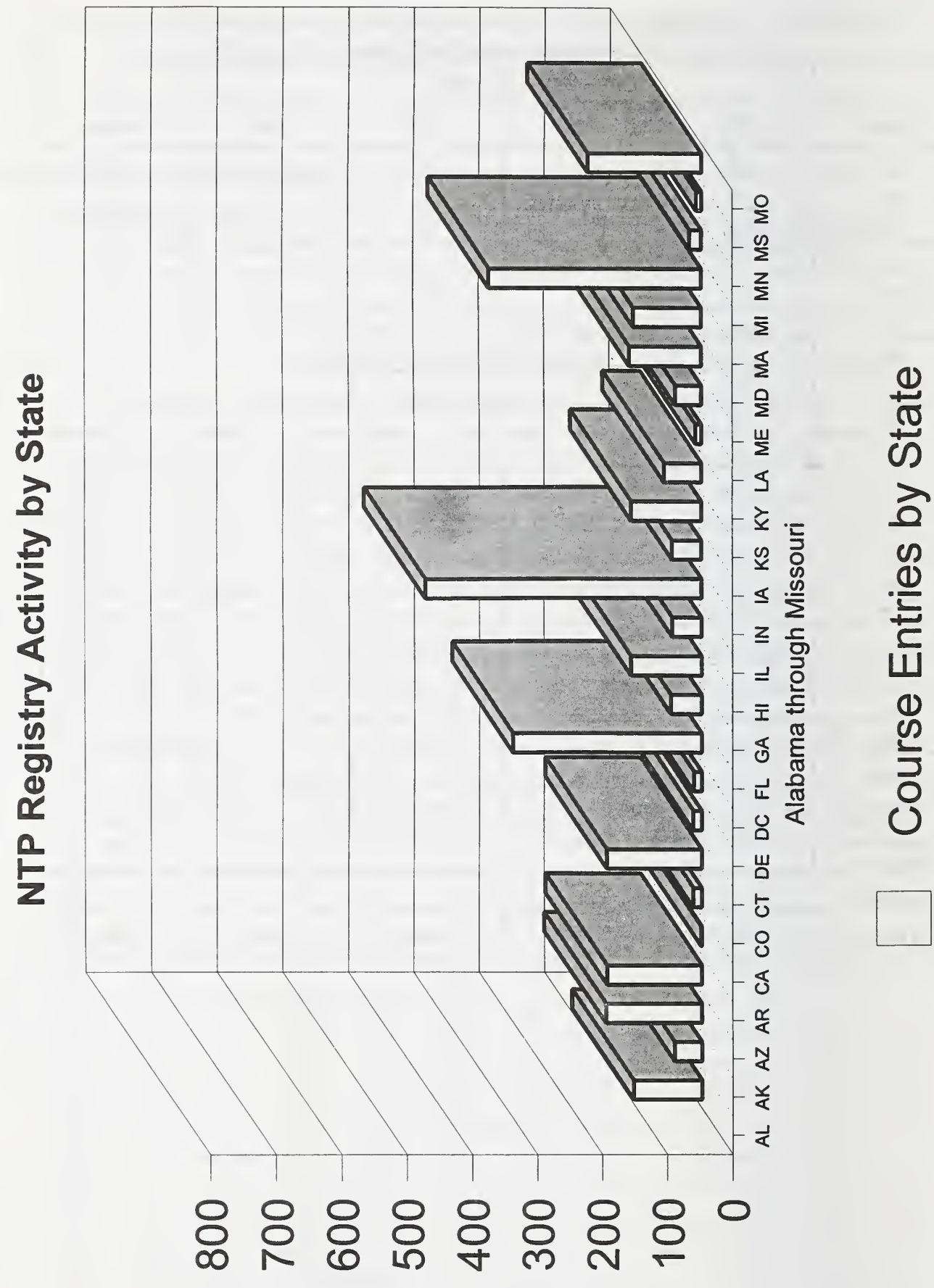
NATIONAL TRAINING PROGRAM REGISTRY
SUMMARY OF METROLOGY SEMINAR ACTIVITY
(As of June 30, 1997)

Courses Listed in the NTP Registry:

No. 201, Basic Metrology I
No. 202, Basic Metrology II
No. 203, Intermediate Metrology
No. 204, Advanced Metrology

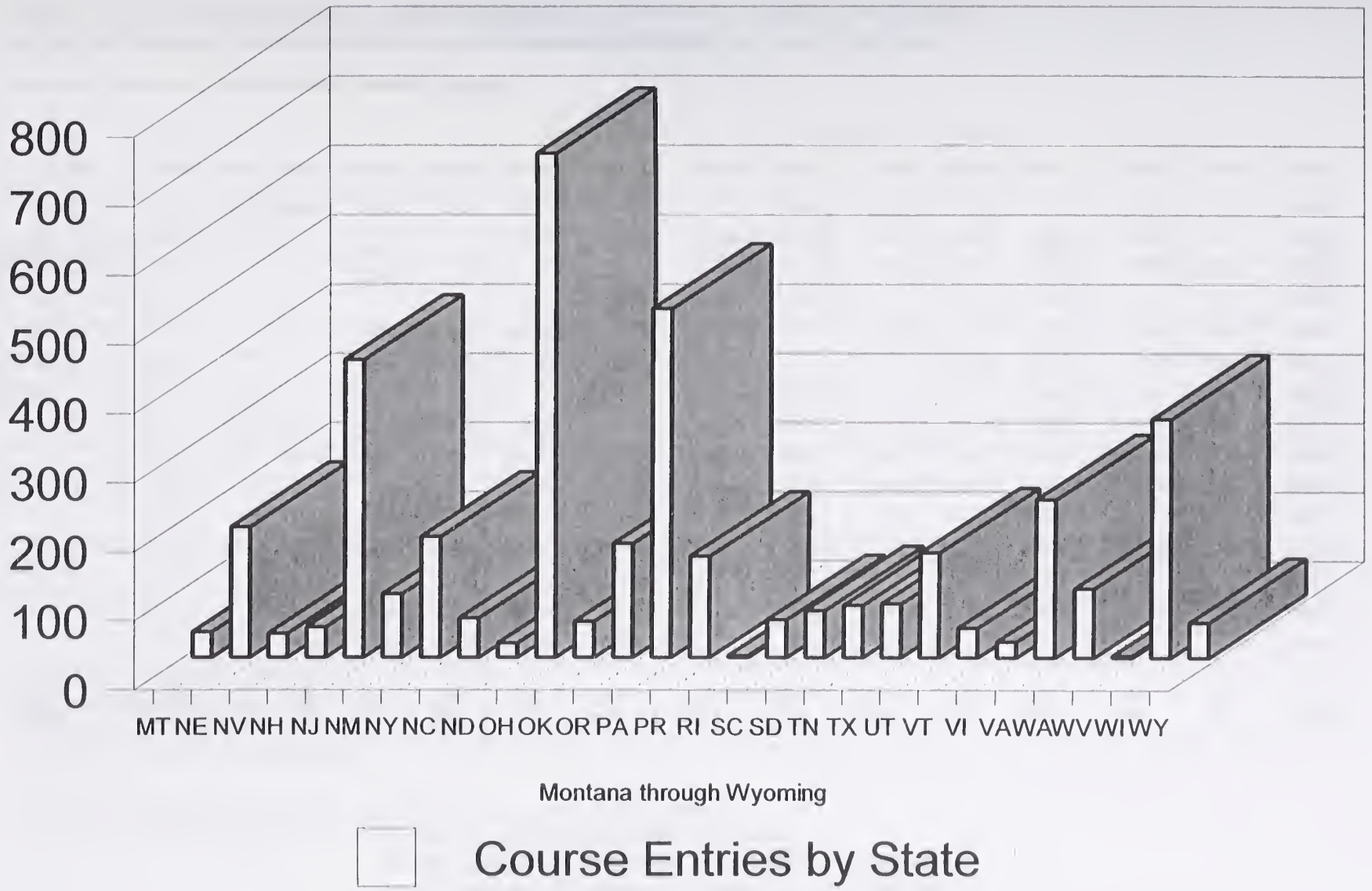
Individuals Trained by Course					
	Course No.				
State	201	202	203	204	Totals
AL		1			1
AK	1	2	1		4
AZ	3	3	3	1	10
CA			2	1	3
CO	2	2	1		5
CT			2		2
DE	1	1	2	1	5
FL	4	4			8
GA	1	1	1		3
HI	2	2			4
ID	1	1	1		3
IL	5	4	1		10
IN	1	1	2		4
IA	1	1	1		3
KS	2	2	2	1	7
KY	2	2			4
ME	2	2	1		5
MD	6	6	8		20
MA	1	1			2
MI	1	1	3		5
MN	1		2	1	4
MS	2	2	3		7
MO	1	1	1		3
NE			2		2
NV	1	1			2
NH	1	1	1		3
NJ			1		1

Individuals Trained by Course					
	Course No.				
State	201	202	203	204	Totals
NY	2	2	2		6
NC	7	7	4	2	20
ND	2	2	2		6
OH	2	2	1		5
OK			1	2	3
OR	1	1		1	3
PA	1	1	2		4
PR	3	3	5		12
RI	1	3			4
SC	1	1			2
SD	1	1			2
TN	3	3	1		7
TX	3	3	2		8
UT		1			1
VT			1		1
VA	3	3	3		9
WA				1	1
WV	2	2	1		5
WI			2		2
Other					
Canada			2		2
Associate Members	71	18	24	22	135
GIPSA	6	1			7
Totals	**151**	**96**	**94**	**34**	**375**


NTP Registry Activity by State
800
700
600
500
400
300
200
100
0
AL AK AZ AR CA CO CT DE DC FL GA HI IL IN IA KS KY LA ME MD MA MI MN MS MO
Alabama through Missouri
Course Entries by State

NTP Registry Activity by State

As of June 30, 1997



Continuing Education Units (CEU's) Awarded
By the National Conference on Weights and Measures
(As of June 30, 1997)

Module Number	CEU's	No. of Particl pants	1985 Total	1986 Total	1987 Total	1988 Total	1989 Total	1990 Total	1991 Total	1992 Total	1993 Total	1994 Total	1995 Total	1996 Total	1997 Total	Grand Total
1	3.1	204		306.90	77.50	117.80	99.20	24.80		3.10	3.10					632.40
2	3.1**	876		65.10	857.90	759.50	173.60	244.90	31.00	297.60	3.10	12.40	164.30	24.80	31.00	2665.20
4	3.1	349				492.90	198.40	170.50	145.70				74.40		6.20	1088.10
5	3.1	436			96.10	133.30	381.30	217.00	220.10	18.60	52.70	55.80	89.90	75.60	80.60	1421.00
6	3.1	39			12.40			55.80		15.50	6.20		31.00		37.20	158.10
7	3.1	320			12.40		248.00	117.80	80.60	80.60	130.20	43.40	179.80	99.20	3.10	995.10
8	2.8	1224		288.40	856.80	260.40	739.20	324.80	112.00	156.80	252.00	50.40	170.80	215.60	89.60	3516.80
10	2.8	686	75.60	372.40	302.40	128.80	417.20	120.40	148.40	123.20	177.20	27.70	16.80	39.20	19.60	1968.90
19	3.5	53						59.50	49.00	38.50			21.00	17.50	3.50	189.00
20	2.8	447			156.80	109.20	109.20	338.80	92.40			254.80	176.40	14.00	2.80	1254.40
21	3.5	162			105.00	129.50	147.00	52.50	31.50		42.00	52.50	3.50	3.50	59.50	626.50
22	2.45	179						230.30	191.10	2.45			14.70			438.55
23	1.00	103									57.00	36.00	6.00	4.00	2.00	105.00
24	1.5	586					15.00	402.00	156.00	34.50	34.50	84.00	93.10	22.50	9.00	859.60
27	1.1	871	155.10	402.60	165.00	66.00	36.30	22.00		24.20	53.90	16.50	1.10	15.40	2.20	960.30
Totals		6525	230.70	1435.40	2642.30	2197.40	2564.40	2381.10	1257.80	795.05	811.90	633.50	1042.8	531.30	346.30	16878.95

**One Module 2 class with 74 participants was given only 2.00 CEU's.

* One CEU is equivalent to 10 contact hours of participation in an organized continuing education experience under responsible sponsorship, capable direction, and qualified instruction.

Continuing Education Units (CEUs) Awarded
By the National Conference on Weights and Measures
For Attendance at OWM Metrology Seminars
(As of June 30, 1997)

Course No.*	No. of CEUs**	Participants	1990 Total	1991 Total	1992 Total	1993 Total	1994 Total	1995 Total	1996 Total	1997 Total	Grand Totals
201	3.60	140	97.20	54.00	7.20	28.80		244.30	72.00	39.60	543.10
202	3.50	96	101.50	52.50	14.00	28.00		129.50	10.50		336.00
203	3.10	94	49.60	40.30	37.60	6.20		127.10	31.00		291.80
204	2.50	19				5.00		42.50		37.50	85.00
Totals		349	248.30	146.80	58.80	68.00	None	543.40	113.50	77.10	1,255.90

* Course No. 201: Basic Metrology I
Course No. 202: Basic Metrology II
Course No. 203: Intermediate Metrology
Course No. 204: Advanced Metrology

** One CEU is equivalent to 10 contact hours of participation in an organized continuing education experience under responsible sponsorship, capable direction, and qualified instruction.

Appendix D

Associate Membership Grant/Training Scholarship Funds Activity
July 1, 1996 - June 30, 199

As of June 30, 1997

The AMC Committee provided four $5,000 grants, one to each region, for the following purposes, all training to be completed by July 31, 1997:

- **media or public relations training (the A&P Committee is to be given the opportunity review the course outline and credentials of any proposed trainer);**
- **printing and/or mailing expenses related to regional newsletters; or**
- **as $500 scholarships for field training**

State/ Region	Region	Request Date	Funds Requested	Funds Paid Out	No. of Scholar-ships	Type of Training	Use Planned	Status *Not Applied For
CA	W	8/1/96	$1,050	$1,050	N/A	Media techniques training (2 two-hour sessions), to be presented by Kerry B. Shearer during the WWMA on 9/24/96	Instructor fees, equipment, handout materials, travel expenses	Conducted and approved for payment 1/9/97
NH	NE	9/12/96	500	0		Metrology training of 1 NH metrologist to attend regional training 10/27-11/1/96, San Antonio, TX	Expenses of metrologist	Disapproved
PA	NE	8/27/96	500	500	1	NIST/NCWM/BRMS/PFMA Prie Verification Instructor Training March 1997, 2 local w&m personnel (E.M. Petricca, $250, Courtney Yelle, $250)	Student expenses	Conducted and approved for payment 6/22/97
PA	NE	8/27/96	1,000	1,000	1	General W&M training in conjunction with PAWM Annual 3-day Conference 10/96, 85 participants daily (instructor fees paid by PAWM).	Meeting room/equipment/breaks	Conducted and approved for payment 1/9/97
MA	NE	8/28/96	500	500	1	Training in testing/sealing of devices, 35 W&M officials Original request changed to provide 3-day training for 30 students 11/19-21/96 in Price Verification (Ken Butcher, instructor).	Meeting rooms/training material/trainer expenses	Conducted and approved for payment 12/31/96
LA	S	8/30/96	500	500	1	Handbook 133 Price Verification training, Danny McCartney instructor; Price Verification training Ike Lawson, 15-20 field inspectors in each 3-5 day class	Lodging/food expenses	Conducted and approved for payment 3/10/97
SWMA	S	9/9/96	500		1	Seminar on the uses of the Internet to be conducted during the Southern W&M Association Meeting October 1996	Meeting rooms and associated costs	0
TX	S	9/20/96	500		1	Handbook 133 training spring 1997; instructors Wayne Bamsch, Harvey Fischer, Sally Preston, Damon Slaydon	Instructor travel, lodging, meals	Released to SWMA

State/ Region	Region	Request Date	Funds Requested	Funds Paid Out	No. of Scholar-ships	Type of Training	Use Planned	Status *Not Applied For
IN	C	923/96	500	494.55	1	Course No. 206, Vehicle and Axle-Load Scales, April; 7-11, 1997; instructor: Jim Vanderwielen	Instructor fee, travel, lodging, and meals	Conducted & approved for payment 5/14/97 $494.55
IN	C	9/23/96	500	500	1	Course No. 302, Retail Motor-Fuel Dispensers & Consoles, June 2-6, 1997; instructor: Tom Stabler, 30-40 inspectors	Instructor fees, travel, lodging, meals	Conducted an approved for payment 6/22/97
AL	S	9/23/96	500		1	to be determined - training at least 14 field staff	Expenses	0
AL	S	9/23/96	500		1	to be determined - training at least 14 field staff	Expenses	0
MO	C	9/26/96	500		1	Costs re public awareness program to promote w&m by providing A&P consumer and industry brochures, Measurement in the Classroom	Reproduction costs	Approved
CA (Kern Co)	W	10/01/96	500	500	1	Expenses of 1 staff member to attend Course no. 206, Vehicle and Axle-Load Scales, 4/07-11/96 sponsored by State of Indiana	Student travel/meals/lodging	Conducted and approved for payment 5/14/97
MT	W	10/01/96	500	500	1	Retail Price Computing Scales training for 9-10 field inspectors 12/96, Ray Waylett instructor (9 students)	Student travel/meals/lodging (actual expenses $2,153.60)	Conducted and approved for payment 2/5/97
MT	W	10/01/96	500	500	1	Retail Price Computing Scales training for 9-10 field inspectors 12/96	Student travel/meals/lodging	Conducted and approved for payment
MT	W	10/01/96	500	500	1	Retail Price Computing Scales training for 9-10 field inspectors 12/96	Student travel/meals/lodging	Conducted and approved for payment
GA	S	10/02/96	500	500	1	General Review of Course 302, RMFD, and Publication 19, 31 students, Curt Williams, instructor, 4/21-22/97	Printing materials, student travel/meals/lodging	Conducted and approved for payment 6/22/97
GA	S	10/02/96	500	500	1	General Review of Courses 203 and 206; L/S Scales, 23 students, Jerry Flanders and Oris Taylor, Jr., instructors	Printing materials, student travel/meals/lodging	Conducted and approved for payment 6/22/97
NC	S	10/02/96	500		1	Expenses associated with Retail Computing Scales class, 11/06-08/96; Jerry Butler instructor; 30 students	Partial reimbursement travel, lodging, meals	Approved
WA	W	10/04/96	500		1	Training on "Truck Mounted Rack Meters," spring, 1997, 18 students, including city jurisdictions	Partial reimbursement travel, lodging, meals	Approved

State/ Region	Region	Request Date	Funds Requested	Funds Paid Out	No. of Scholar-ships	Type of Training	Use Planned	Status *Not Applied For
NH	NE	10/14/96	500	500	1	Media and HB44 training in conjunction during the NEWMA spring 1997 meeting, 3 students	Student travel/meals/lodging	Conducted and approved 5/21/97
NEWMA	NE	10/17/96	2,000	2,000	N/A	Media training in conjunction with NEWMA spring 1997 meeting, 40-50 students	Expenses	$1,000 advance approved 3/13/97 $1,000 balance approved 6/2/97
AK	W	10/22/96	710	597.36	N/A	Price Verification training, 3 days, February 26-28, 1997, Tim Douglas, Seattle, WA, instructor, 9 students	Instructor and student expenses	Conducted & approved for payment 3/24/97
CT	NE	10/28/96	500	500	1	Vehicle Tank Meter Code Review Training for 2 inspectors conducted during the NEWMA Annual Meeting	Expenses of 2 students	Conducted & approved for payment in advance 4/20/97
SWMA	S	10/29/96	1,000		N/A	Southern Weights and Measures Regional Newsletter	Expenses of publication	
CWMA	C	10/31/96	3,500	3,500	N/A	Vehicle and Axle-Load Scales training 4/27-5/2/97, Kalamazoo, MI, Jim Truex/Rich Philmon instructors (MI $2333.25, OH 431.94, IL 500.00, WI 234.81)	Expenses of students and instructors	Conducted & approved 6/2/97
AR	S	10/28/96	1,000	Unable to use funds	2	Vehicle Scale Testing training, March 1997, Richard Suiter instructor (20 students)	Expenses of students and instructor	Cancel ed (funds released to Texas)
CA	W	10/30/96	370	560.25 balance of WWMA	N/A	HB133 computer & software training, February, March 1997, Roger Macey, instructor (15 students)	Expenses of instructor	Conducted & approved 6/3/97
UT	W	Carry-over from 0696	370	292.39	N/A	Checking the Net Contents of Packaged Good, week of 12/12/96, Brett Gurney instructor (6 students)	Expenses	Conducted and approved 2/5/97
TN	S	6/18/97	1,000 (grant first awarded to AR-unable to use)	$489.80	N/A	HB 133 Instructor Training participants from 20 jurisdictions; Ken Butcher, Tom Coleman, instructors	Expenses of Vernon Massey, Shelby County, TN, to attend training Remainder: to be advised	$489.80 advance to Vernon Massey

Summary of Regional Requests (Number of Scholarships Requested Appear in Parentheses)			
NEWMA	SWMA	CWMA	WWMA
NEWMA (grant) $2,000.00	AL (2) $1,000.00 (no request for disbursement)	IN (2) $1,000.00	WWMA (grant) $1,050.00
MA (1) 500.00	GA (2) 1,000.00	MO (1) 500.00	AK (grant) 710.00
NH (1) 500.00 (1) denied 500.00	NC (1) 500.00 (no request for disbursement)	CWMA (grant) 3,500.00	CA - Kern County (1) 500.00
PA (3) 1,500.00	LA (1) 500.00		MT (3) 1,500.00
CT (1) 500.00	UNABLE TO USE - AR (2) 1,000.00 Funds reassigned to TN ($479.80 disbursed)		WA (1) 500.00
	SWMA 500.00 (Internet training, no request for disbursement)		UT (grant) 292.39
	SWMA 1,000.00 (for newsletter expenses)		CA (grant) 560.25
Total $5,000.00	Total $1,979.80	$5,000.00	$5,000.00

Application for Associate Membership Scholarship Funds

The Associate Membership Committee (AMC) continues its commitment to training of weights and measures personnel. During the 82nd Annual Meeting, the Associate Membership provided 52 $500 scholarships, for the following purposes, all undertakings to be **completed and funds paid out by July 31, 1998:**

- As $500 scholarships for training of weights and measures field personnel,
- One $500 scholarship per region may be used to support publication of the weights and measures association's newsletter.

Purpose of request:
Proposed dates of event:
Instructor(s) if appropriate:
Total number to be trained:

Estimate of Expenses

Instructor Fee(s)	Travel	Lodging	Meals	Other (identify)	Total
$	$	$	$	$	$

✓Signed: _____ Date: _____

Applicant

(Please print or type) Name/Title:
Agency/Organization:
Mailing Address:
City/State/Zip:
Telephone: Fax: E-Mail:

Please mail completed form to:

Tom Coleman/Joan Mindte
NCWM
Post Office Box 4025
Gaithersburg, MD 20885
(301) 975-4868 - (301) 975-4003

All activities must be completed and funds paid out by July 31, 1998

Associate Membership Scholarship Fund
Request for Disbursement of Scholarship Funds

Please provide the following information upon completion of the training:

Type/Title of Training	
Dates	
Location	
Instructor(s)	
Total # in the Class	

Summary

Date	Instructor Fee(s)	Travel	Lodging	Meals	Total
	$	$	$	$	$
Note: Scholarship is limited to $500 (Receipts are required for all items claimed) One $500 scholarship per weights and measures region may be used to support the publication of the association's newsletter. **ALL activities must be completed and funds paid out by July 31, 1998.**					$

I hereby certify that the expenses listed are true and accurate.

Signed: _____ Date: _____
Claimant

Approved: _____ Date: _____
NCWM Executive Secretary

Make check payable to: _____

Mail to:

_____

_____

Please mail completed form and receipts to:
Tom Coleman/Joan Mindte
NCWM, Post Office Box 4025
Gaithersburg, MD 20885
Telephone 301-975-4868 / 301-975-4003

Appendix E

NIST/NCWM Instructor Training by State
(As of June 30, 1997)

ALABAMA
- Steadman Hollis — Handbook 133
- Frank Gissendanner — Price Verification, Handbook 133

ARIZONA
- Sheryl Walls — Handbook 133, Price Verification

ARKANSAS
- Tim Chesser — Handbook 133

CALIFORNIA
- Steve Clay — Handbook 133
- Dennis Johannes — Handbook 133, Price Verification
- James Delperdang — Retail Computing Scales
- Marianne Delperdang — Price Verification
- Roger Macey — Handbook 133
- Brett Saum — LPG

COLORADO
- Bob Athern — Handbook 133, Price Verification
- Howard Nobel — Handbook 133

CONNECTICUT
- Bill Donahoe — Handbook 133
- Frank Forrest — Retail Computing Scales
- Thomas Phelps — LPG
- Peter Wilson — Handbook 133

DELAWARE
- Steve Connors — Handbook 133
- Tony Deserto — LPG, Price Verification
- William Lageman — Price Verification
- Stephen Nickerson — Handbook 133

DISTRICT OF COLUMBIA
- Jeff Mason — Handbook 133, Price Verification, Retail Computing Scales

FLORIDA
- Carlos D'Arcy — Handbook 133
- Fred Derby — Handbook 133
- Bob Garris — Price Verification
- Bryan Yongue — Handbook 133

HAWAII
- Earl Payanal — Retail Computing Scales
- Dianne Yamamoto — Price Verification

ILLINOIS
- Richard Philmon — Handbook 133
- Greg Plym — LPG
- Kyran Wagenecht — Retail Computing Scales

INDIANA
- Mike Horan — Handbook 133

IOWA
- Darryl Brown — Retail Computing Scales, Price Verification, Handbook 133
- Ralph Venticher — LPG
- Ivan Hankins — Handbook 133
- Arlyn Oman — Handbook 133

KANSAS
- Lewis Hutfles — LPG
- Maureen Henzler — Handbook 133 - Price Verification - Retail Computing Scales

KENTUCKY
- Randy Wise — Handbook 133, Price Verification

LOUISIANA
- Isiah Lawson — Handbook 133, Price Verification
- Danny McCartney — Retail Computing Scales, Handbook 133

MAINE
- John Cunningham

Retail Computing Scales
Danny Newcombe Price Verification

MASSACHUSETTS
Stephen Agostinelli Handbook 133
Stephen Berard Handbook 133
Mark Coyne (Brockton)
Retail Computing Scales
Robert McGrath (Boston) Handbook 133
Harvey Paclat (Boston) Handbook 133

MARYLAND
Gene Baumann Handbook 133
Bob Eaves Handbook 133
Price Verification
Tom Fagan Handbook 133
Michael Frailer Handbook 133
Lisa Griffith Handbook 133
William Hall Handbook 133
Mark Lambert Handbook 133
Donald Mason Handbook 133
Price Verification - LPG
Barbara Miller Handbook 133
Edward Payne, Jr. Handbook 133
Price Verification
Retail Computing Scales
Jim Price Handbook 133
Kenneth Ramsburg Handbook 133
Price Verification - LPG
Retail Computing Scales
Richard Wotthlie LPG

MICHIGAN
Dan Dickerson Price Verification
Terry Gawel Price Verification
Ed Paladi Handbook 133
Mike Pinagel Handbook 133
Price Verification - LPG
Retail Computing Scales

MINNESOTA
Roger Menk Handbook 133

MISSISSIPPI
Herald Baughman Price Verification
Ralph Blake Handbook 133
Price Verification
Retail Computing Scales
Gerald Broom LPG
Sammy Lang Handbook 133

MONTANA
Jack Kane Handbook 133 - LPG
Alfred Page LPG
H. Ray Waylett Retail Computing Scales

NORTH CAROLINA
Gerald Brown Price Verification
Jerry Butler Retail Computing Scales
William Nelson Handbook 133
Donnie Perry Handbook 133

NEBRASKA
Scott Arner LPG
Richard Suiter Handbook 133

NEW HAMPSHIRE
Richard Cote Price Verification
Handbook 133
Retail Computing Scales
Jeff Wentworth Price Verification
Kevin Young LPG

NEW MEXICO
Joe Gomez Price Verification
Wilfred Mendoza LPG

NEW JERSEY
Robert Alviene Handbook 133

NEW YORK
Michael Sikula Handbook 133

OHIO
Barbara DeSalvo Handbook 133
Kenneth Wheeler
Retail Computing Scales
Jeffrey Yankosky (Cincinnati)
Handbook 133

OKLAHOMA
Charles Carter Handbook 133
Retail Computing Scales
Price Verification

OREGON
Clark Cooney LPG

PENNSYLVANIA
Michele DeMarshall (Philadelphia)
Handbook 133
Price Verification
Retail Computing Scales
Dean Ely LPG

Rick Fogal	Handbook 133
Steven Reilly (Bucks County)	Handbook 133

SOUTH CAROLINA

David Ellisor	Price Verificatioon

TENNESSEE

Charles E. Coleman	Handbook 133 Price Verification
Dale Drinnon	Handbook 133
Rickey Freeman	Handbook 133
Randy Jennings	LPG
Danny Ray Scott	Retail Computing Scales Handbook 133
James Thompson	Handbook 133
Clyde E. Woods	Handbook 133

TEXAS

Harvey Fischer	Handbook 133
Sally Preston	Handbook 133
Edwin J, Price	Price Verification Handbook 133
Richard Rendon	Retail Computing Scales
Damon Slaydon	Handbook 133
Jim Wiechkoske	LPG

UTAH

Brett Gurney	Handbook 133

VIRGINIA

Wes Diggs	Handbook 133

VERMONT

Ray Cioffi	Handbook 133

WASHINGTON

John Allen	Handbook 133 - LPG
Tim Douglass (Seattle)	Price Verification
Bruce Feagan (Seattle)	Handbook 133 Retail Computing Scales
Arthur Fluharty	Price Verification
Rick Mulcahy	Retail Computing Scales

WISCONSIN

Kathryn Dresser	Price Verification Handbook 133 Retail Computing Scales

WEST VIRGINIA

Steve Casto	LPG Retail Computing Scales
William A. Cobb	Handbook 133 Price Verification

WYOMING

Ron Weber	Handbook 133

States that have requested and have received individual training:

South Carolina - Handbook 133
Louisiana - Handbook 133
Washington - Handbook 133
West Virginia - Handbook 133

Appendix F

Incident/Accident Report Summary

(The following reports have been completed and received as of June 30, 1997)

The purpose of this form is accident prevention. Please incorporate this summary into your safety program documentation procedures. Completing this brief report will allow NCWM to alert other organizations and jurisdictions of hazards and possible corrective actions.

1. What weights and measures function was the employee performing, where, and when?

Responses:

a. Routine small scale inspection in grocery store.
b. Using bottle cage & bottle to retrieve tank samples at coastal fuel facility.
c. Employee was exiting K-Mart following package inspection.
d. Inspector opened lower cabinet panel to inspect security seals, etc.; gust of wind blew dirt particles into eye.
e. Cleaning the floor drain in calibration bay in metrology lab.
f-1 Testing gas pumps.
f-2 Testing gas pumps.
f-3 Testing livestock scale - with cart.
f-4 Testing bulk oil meter.
g. Driving weight truck.
h. Personal injury in performance of employee's job.
i. Two employees were inspecting marina gasoline pumps.
j. Employee involved in vehicle accident resulting in personal injury.
k. Performing calibration test at A&M Food Mart's gasoline pumps
l. Employee testing and inspecting petroleum dispenser.
m. Inspection of vehicle scale at co-generation plant

2. Briefly describe the incident.

a. Carried 30 lb. Weight kit, slipped on a wet surface (did not fall).
b. Employee extended arms & equipment in front of himself to lower into tank opening. The fuel terminal policy requires inspector to stand on walkway above the tank opening and not on the floating tank top.
c. Inspector stepped off curb, twisted ankle, landed on right knee.
d. Gasoline pump inspection at oil company.
e. Employee was picking up debris covering floor drain to allow water used in prover calibration to drain out of area.
f-1 Carrying 2 five-gallon test measures over uneven terrain; strained neck.
f-2 Carrying 2 empty five-gallon test measures down incline; severe ankle sprain.
f-3 Moving weight cart with handle in folded position; hand cut when cart whipped.
f-4 After weighing full 55 gallon barrel of oil, moving off scale, barrel slipped; employee grabbed it to keep from falling and strained sphincter muscle.
g. Rounded bend in road on foggy day; 500 lb. weight slid out of carrying compartment and fell off truck, bouncing on pavement into oncoming lane and across (no cars were in opposite lane).
h. Slipped on wet spot on floor while wearing steel-toed safety shoes.
i. Flash fire of gas vapor at fill box and opening of 6000 gallon fiberglass tank reported to fire marshal, who stated there was no fire; that a vapor fire extinguished itself. Ignition sources sought.
j. Employee was using seat belts; there was no mechanical or system failure.
k. Gasoline sprayed back into inspector's face and under left eye.
l. Inspector was kneeling while reading from test measure; lady in car moving in reverse backed into employee. Rear bumper struck employee on left side of fact, pushing him forward, scraping right knee.
m. After inspector made adjustment under the scale platform, the inspector was guiding the

weight truck onto the scale and he fell through the open access panel.

3. Contributing factors (check all that are appropriate):

☐ inexperience	d. g. weather conditions	☐ improper equipment
☐ lack of training	☐ equipment failure	e. lack of protective gear
f-3 employee error	☐ failure to follow procedures	i. hazardous materials
f-4 insufficient personnel	☐ job fatigue	c. unsafe work surface
m. haste	a. f-1 f-2 i. environmental conditions	e. housekeeping
		b.d.k. other

Comments:

c. Crack and hole in the road.
d. Incident could occur in number of outdoor work environments; employee wears corrective glasses; short of wearing safety shield, accident was unavoidable.
g. Installed a better compartment for carrying weights.
i. Potential of static ignition present when: low humidity, static charge potential on one or two surfaces, spark discharge of adequate energy, ignitable vapor to air mixtures, and means to generate static charge.
j. No preventive action taken, planned, or needed to prevent recurrence.
k. This type of incident occurs from time to time in calibration work and drawing samples of product, the result of sudden pressure from the hose nozzle
l. Employee was observing safety procedures, using safety cones and barricade at time of accident.

4. Recommendations for corrective action:

a. Use non-skid shoes, watch for wet areas.
b. Request assistance when sampling this type of tank.
c. Get in shape and start a daily exercise routine.
d. None at this time.
e. Employees will be advised to wear protective gloves when picking up debris
f. In testing gas pumps, if uneven surface, only carry one (1) can at a time; only move weight cart with handle extended; directive to staff: companies are to provide personnel to handle 55 gallon drums.
g. Install better compartments for carrying weights; possible regulation for carrying mass standards on highways (i.e., chaining in).
i. Investigate for potential source(s) of ignition of gasoline vapor; full inspection by gasoline pump service organization for electrical connections to tank and dispenser; fire marshal suggests bond and ground wires from funnel to gasoline container, and the funnel to available ground.
m. All access plates must be securely closed before any inspection work is to be performed on a scale.

Incident/Accident Report

(To be completed & submitted unsigned, anonymously)

The purpose of this form is accident prevention. Please incorporate this summary into your safety program documentation procedures. Completing this brief report will allow NCWM to alert other organizations and jurisdictions of hazards and possible corrective actions.

1. What weights & measures function was the employee performing, where, and when?

_____
_____
_____
_____
_____

2. Briefly describe the incident.

_____
_____
_____
_____
_____

3. Contributing factors (check all that are appropriate):

- ☐ inexperience
- ☐ lack of training
- ☐ employee error
- ☐ insufficient personnel
- ☐ haste
- ☐ weather conditions
- ☐ equipment failure
- ☐ failure to follow procedures
- ☐ job fatigue
- ☐ environmental conditions
- ☐ other
- ☐ improper equipment
- ☐ lack of protective gear
- ☐ hazardous materials
- ☐ unsafe work surface
- ☐ housekeeping

Comments:

_____
_____
_____
_____
_____

4. Recommendations for corrective action:

_____
_____
_____
_____

You may continue your comments on the back of this sheet

Please mail completed form to: Tom Coleman, NCWM,
Post Office Box 4025, Gaithersburg, MD 20855
(telephone: 301-975-4868)

Continuation of Comments on Numbered Items

1.

2.

3.

4.

Miscellaneous remarks:

The NCWM Committee on Education, Administration, and Consumer Affairs greatly appreciates your making the effort to complete and return this information for inclusion in the planned Safety Information Clearinghouse.

Metrology Subcommittee & Metrology Meetings

L.F. Eason, Chairman
North Carolina

Subcommittee Survey Results and Ongoing Efforts - L. F. Eason

L.F. Eason presented the 1996 NCWM State Laboratory Program workload survey results to the Executive Committee, the Metrology Subcommittee and during the General Session. Results have been and are being presented at all regional metrology meetings during 1997. Survey results were also presented to the NIST Calibration Program and Mass Group during a joint meeting with the NCSL United States National Measurements Requirements Committee on May 20, 1997. L.F. Eason (NC) and Ken Fraley (OK) attended that meeting on behalf of the State Laboratory Program. It is anticipated that a paper and survey results will be formally published during 1998.

Summary statistics and highlights are as follows:

- Nearly 340,000 standards are calibrated each year by the State laboratories in the areas of mass (88 %), volume (3 %), tuning forks used to calibrate radar guns (4 %), wheel-load weighers used in highway weight enforcement (2 %), and all other tests including thermometers, length standards, and timing devices (3 %).
- Mass measurement is the predominant workload for the SLP. Ten percent of the total workload consists of precision mass calibrations for verification of State primary or working standards and calibrations for customers. Seventy-eight percent consists of tolerance testing level calibrations performed for enforcement staff, service companies, general manufacturing, and other companies.
- There are nearly 19,400 customers of State laboratories. Of these, 51 percent are weights and measures related (including the 8 % who are actual W&M enforcement staff). Based on responses from 189 scale service companies, only 63 percent of the work done by scale service companies directly affects regulatory Weights and Measures. The remainder of the SLP customers are in the following categories: general manufacturing (23 %); quality of life such as biomedical and pharmaceutical (9 %); defense, energy, and aerospace (2 %); other government agencies and service companies not related to enforcement (15 %).
- The average turn around time for calibrations performed in State laboratories is less than 1 week.
- State laboratory personnel contribute effort estimated to be equivalent to three full-time staff members to the NIST Office of Weights and Measures, State Laboratory Program, through such activities as: coordinating meetings and interlaboratory comparisons, data analysis, document preparation and review, training, laboratory assessments, and technical assistance.

NCWM Executive Committee Proposals

Updated proposals from the Metrology Subcommittee were presented to the Executive committee and are included in an Appendix to the Executive Committee report.

Forum for Railroad Issues: International Traceability and Custody Transfer

A meeting was held March 20 and 21, 1997, in Chicago, IL, to discuss concerns raised to the metrology subcommittee by Steve Malone (NE) and a request from Canada regarding mutual recognition of railroad test car calibrations performed in the United States and Canada. The report of that meeting is attached as Appendix B and provides background information for this topic. A forum was held during the NCWM general technical session to present information, data analysis, and to answer questions regarding railroad test car calibration and the railroad scale system. The following topics were presented by speakers noted:

- "Current Status of Canada's Request for Intercomparisons," Renald Marceau, Measurement Canada;
- "Summary of Railroad and Contractor 'Controls' for Handling and Tracking of Railroad Test Cars Used as Standards," Bob Feezor, Norfolk Southern;
- "Evaluation of Master Scale Data, Test Car Data, Round Robin Data," Georgia Harris, NIST Office of Weights and Measures.

From the evaluation of data, the following recommendations were made:
Affected/involved participants:

- Continue test car calibration intercomparisons and dialog among: USDA, States, Railroads, Canada, and Mexico;
- Standardize calibration and verification procedures (in process);
- Continue data collection for master scales and test cars; improve detail and consistency of comments and maintenance records; collect real as found data.

Weights and measures officials:

- Jurisdictions with oversight for scales should witness tests and evaluate data;
- Registration programs should include placing track scales into service, test car equipment maintenance and calibration, with reports submitted to the State for oversight; and
- Specific problems that are observed in the system should be communicated and corrected as soon as possible (keep open communications.)

Data that was reviewed included the following:

- Data for 13 Master Track Scales was submitted by USDA/GIPSA.
- Data for 230 Railroad Test Cars and 824 tests (average 105 tests per year) was submitted by: USDA/GIPSA, railroads, Oregon, Minnesota, and Canada (20 cars.)

The summary of the data analysis indicated that:

- Master scales are relatively stable over time with the mean of all scale values being 0.2 pound and standard deviations less than 3 pounds.
- Railroad test cars are fairly stable considering 60 percent are found out of tolerance (0.01%, Class F) at the time of test. But, 80 percent of the errors are less than 50 pounds, only 10 percent of the errors are greater than 100 pounds, and very little of the data is *real* as found data since calibrations are performed after repair and/or maintenance.

Additional work is ongoing in the intercomparisons of railroad test car calibration between the United States and Canada.

Acronyms International - Future Directions in Metrology - Sharrill Dittmann, NIST Calibration Program

Sharrill Dittmann of the NIST Calibration Program presented an overview of the various organizations involved in coordination of international activities in metrology, calibration, legal metrology, and laboratory accreditation. A handout showing a world map and the acronyms of various organizations is included as Appendix C.

Life After Accreditation - Impact of Changes in the State Laboratory Program - Georgia Harris, NIST OWM

Recent changes in the NIST Office of Weights and Measures State Laboratory Program were addressed along with many of the questions which have been raised by the States in response to changes identified at the 1997 NCWM Interim Meeting. A memorandum from Peter Heydemann and *Metrology's Top Questions & Answers About "Accreditation"* from the NIST/OWM Web site were distributed during the meeting and are attached as Appedices D and E.

NCSL United States National Measurements Requirements Committee Results and Report - L.F. Eason, NC

Information regarding the NCSL Survey of NIST customers and the separate analysis of State respondents was presented to the Metrology Subcommittee and to NIST during a meeting on May 20, 1997.

Metrological Timelines - Chuck Ehrlich, NIST Office of Standards Services

Chuck Ehrlich presented a paper on using metrological timelines to track the traceability of standards. A copy of this paper is included as Appendix A to this report.

Software Demonstrations

Laboratory software demonstrations were presented during one of the Metrology Subcommittee sessions by Georgia Harris, NIST, and by Frank Wieszek, Mettler.

Regional Reports

Informal reports summarizing meeting and/or current activities were presented by each of the representatives to the Metrology Subcommittee. Based on decisions made by the Executive Committee, the Subcommittee will only have public representatives in the future, although all meetings are open. Updates were provided regarding meeting dates, locations, topics, and current round robin activities. Some regional groups provided specific laboratory updates as well.

Appendix A

[Presented at the 1997 Measurement Science Conference, Pasadena, California, January 24, 1997.
A new version of this paper is in process. Interested parties may contact the first author listed below.]

Metrological Timelines in Traceability

Charles D. Ehrlich and Stanley D. Rasberry

Technology Services
National Institute of Standards and Technology
Technology Administration
United States Department of Commerce

ABSTRACT

There is a growing requirement for an internationally accepted system of recognition of measurement capabilities and relationships within and among countries, to facilitate seamless global commerce and trade. As a result, metrologists worldwide have recently developed increased interest in the concept and definition of traceability. Classically, traceability provides a way of relating the results of a measurement (or value of a standard) to higher level standards. Such standards are usually national or international standards, and the comparisons used to provide the traceability must have well-understood uncertainties. An additional complexity arises because all instruments and standards are subject to change, however slight, over time. This paper develops approaches for dealing with the effects of such time-dependent changes as a part of traceability statements. The use of roadmaps in time, or metrological timelines, greatly facilitates visualizing these relationships in a statement of traceability. When the rate of change in the measurement process is sufficiently small, the approaches proposed here will be less important. However, documented measurement assurance procedures are required at all levels to estimate confidently the appropriate uncertainties. When laboratory or national boundaries are crossed in the traceability process, other factors may come into play, and the original concept of traceability can become obscure. For this reason, it may prove practical to use other words or phrases, such as "equivalency," to describe these more complex measurement relationships.

INTRODUCTION

World-wide commerce requires a coherent measurement system within which the consistency of measurements is easily maintained and demonstrated. Buyers and sellers have needed such a system in order to evolve from barter to patterns of trade which use specifications for such things as size or performance. Classically, traceability [1] provides a way of relating the results of a measurement (or value of a standard) to higher level standards. Such standards are usually national or international standards, and the comparisons used to provide the traceability must have well-understood uncertainties. There is growing interest in the practical use of traceability to demonstrate the integrity of the various comparisons, or for that matter, just what it is that should be compared. Since all instruments and standards are subject to changes, however slight, over time, the use of roadmaps in time, or metrological timelines, greatly facilitates visualizing measurement relationships in a statement of traceability. This paper will discuss these issues, as well as address the need for the use of other terms to describe the variety of additional concepts usually associated with traceability.

The approach taken here to understanding metrological timelines in traceability is still under consideration and discussion at the National Institute of Standards and Technology (NIST). This paper is motivated primarily out of expressed interest in this topic by industrial-based organizations such as the National Conference of Standards Laboratories and the Measurement Science Conference. Comments are welcomed by the authors.

Requirements for Traceability

Depending on the measurement requirements and the resources available, the need for traceability and the form it takes may vary considerably. Manufacturers want the benefits of traceability so that customers will know the available level of performance for instruments and materials. Regulators demand traceability to ensure that public safety requirements are met. The military uses traceability to provide a coherent measurement system for protecting lives, including their own, and providing national security.

Common to all of these requirements is a need to know the results and uncertainties of measurements: the more consistent that all measurements of a particular kind of quantity are throughout a society, the more consistent and compatible are the products and services based on those measurements. This in turn leads to more equitable trade and more efficient economies.

It is typically the responsibility of a national metrology institute (NMI) to provide the nation's measurement infrastructure with access to accurate measurement capability. The comparability of measurement values and associated uncertainties with those of other nations is determined through a variety of mechanisms, including bilateral intercomparisons and international measurement round robins. As will be discussed later, such comparability does not necessarily constitute traceability.

Requirements for accuracy in measurements translate into a need to know both the results of measurements and the uncertainties associated with these results. If it were practical, for the sake of coherence and consistency, all measurements of a given type in a country would be made using the same national standard in every laboratory in which the measurements are made. However, this is clearly impractical for several reasons, primarily because the volume of measurements makes this impossible. Therefore, it is necessary to establish the relationship of the result of a measurement made using an industrial instrument with that which would have been obtained using the corresponding national standard.

The formalism of traceability is the tool that provides these measurement relationships. It is the process by which acceptable measurements with well-understood uncertainties can be documented to the degree required by interested parties. At its root, the primary use of traceability is to answer the questions (of auditors, regulators, those with a need for the "right" answer, ...): "By how much should the measurement result that I obtain today, using my instrument, be corrected so that it is consistent with the measurement result that I would have obtained today if I could have used the instrument (standard) to which I want my measurement to be traceable? What is the uncertainty of this corrected measurement result?"

It should be noted that the result of a measurement, and its traceability, may be useful even when the measurement uncertainty is relatively large. It is incumbent upon the user of the measurement to state the allowable magnitude of uncertainty for specific measurement applications.

Current Definitions of Traceability

Probably the most widely-used and accepted definition of traceability is given in the 1993 *International Vocabulary of Basic and General Terms in Metrology* (VIM) [1], published by ISO, as: "property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." There are variations of this definition, as covered in reference [2], including at least one that introduces the important additional requirement that quality assurance systems be in place. However, while possibly implied, there seems to have been no discussion until recently of the need to explicitly consider the role that time plays in the definition of traceability.

New Definitions of Traceability

In his presentation at the 5th U.S. - Italy Bilateral Seminar [3], Robert Hebner, the Acting Deputy Director of NIST, presented the following definition of traceability: "property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties. It is noted that traceability only exists when scientifically rigorous evidence is collected on a continuing basis showing that the measurement is producing documented results for which the total measurement uncertainty is quantified." Note that the first sentence repeats the VIM definition. The second sentence is new, and was meant to emphasize that a single measurement result is insufficient to establish the uncertainty relationships required over time to achieve meaningful traceability, and that, rather, direct periodic comparisons are required. In accordance with this principle, we show here that internal measurement assurance, using control (check) standards [1], is required to fully demonstrate that uncertainties remain within acceptable levels when establishing traceability relationships. The rigor and level of detail of the measurement assurance procedures required will depend on the relative level of uncertainty of the systems of standards involved.

The next section details how such traceability can be achieved. In particular, it shows why it is important to explicitly include the timeline of all relevant measurement events (the "metrological timeline") that supports and constitutes the chain of comparisons in a "statement of traceability."

Note that in these definitions, it is the result of a measurement or value of a standard that possesses traceability. Strictly speaking, then, traceability is *not* a property of an instrument or a laboratory, but of course includes the properties of instruments and laboratories. Such shorthand designations are frequently used, however, and so it is important in such cases to specify the covered range of operation of the instrument, or the applicable metrological variables and ranges for the laboratory, for which the traceable condition applies. Since an instrument is required to obtain the result of a measurement, the VIM definition of traceability should

probably be modified to explicitly accommodate the concept of traceability of an instrument. However, verification that the instrument is performing as expected must be part of the expanded definition.

METROLOGICAL TIMELINES

The most important aspect of a measurement process is to "get the measurement right" to some level. However, defining what "getting the measurement right" means is not always clear or straightforward. This is especially true if what is being measured is changing significantly with time, if the instrument being used to make the measurement is changing significantly with time (e.g., drifting), or if the reference standard to which the measurement is to be traceable is changing significantly with time. A rigorous, comprehensive statement of traceability must be capable of defining the measurement process and the associated measurement uncertainties clearly enough that the relatively "instantaneous" measurement can be "gotten right," even when things are changing with time, as they frequently are. The use of metrological timelines greatly facilitates dealing with time variations in quantities (that are meant to be stable) when documenting traceability.

Measurement Uncertainty

Assessing measurement uncertainty is at the core of establishing traceability of a measurement result, and so it is important to have an accepted, well-established technique for assessing measurement uncertainty under a variety of measurement conditions. The 1993 *Guide to the Expression of Uncertainty in Measurement* [4], published by ISO, and the 1994 Edition of *NIST Technical Note 1297* [4a] nicely address the questions of how to assess and express measurement uncertainty, especially if what is being measured is not changing with time. In its scope, the *Guide* states that it "is primarily concerned with the expression of uncertainty in the measurement of a well-defined physical quantity – the measurand – that can be characterized by an essentially unique value." For purposes of demonstrating traceability, the principles of the *Guide* can be used for assessing individual uncertainties at "discrete measurement events", defined here as those covering time periods that are relatively short in comparison with the time period over which the measurand might be changing. For those cases where there is a known, systematic error (such as a documented drift over time in the use of an instrument), a simple way of incorporating such a known, uncorrected error into uncertainty considerations has been suggested by Phillips and Eberhardt [5]. Note, however, that the *Guide* recommends correcting for such systematic errors whenever possible, and including a component of uncertainty for this correction.

What follows in this section is a description of the key elements of measurement assurance systems and metrological timelines used to develop rigorous yet practical statements of traceability. The measurement assurance system in an NMI is used as an example to develop the concept of the metrological timeline. Monitoring stability of the national standards is essential, but is usually maintained at a level to be of minimal concern to those wishing to demonstrate traceability to national standards. This means that it is not ordinarily necessary to consider stability of the national standards when demonstrating traceability from lower levels. In fact, quite the opposite is true, and only in rare cases, such as development of a new International Temperature Scale, and only when the very best uncertainties are required, is it necessary to consider such changes. Laboratories below the national level need to document the measurement assurance they use to demonstrate traceability from their levels to the national level. The techniques demonstrated here for the national level can be used at lower levels for this purpose.

Metrological Timelines for Measurement Assurance

Figure 1 is a simple metrological timeline, illustrating one of several possible internal measurement assurance systems for a primary measurement standard (denoted by the box containing the letter P) in an NMI. The time axis is shown along the top of the figure, with time increasing from left to right. Three "metrological events" are indicated on the time axis (by the ticks at times t_0, t_1, and t_2). The time axis is not to scale, but rather depicts schematically the time-order of events. Similarly, the "time duration" of an event under any of the ticks, which could be indicated schematically by the width of the set of boxes and arrows "under" a tick, is also not to scale. Each event is roughly centered under the appropriate tick on the time axis at which the event takes place. Note that the actual time duration for a particular event will depend on the nature of the event, and supporting documentation can be used to provide such details when necessary.

The first metrological event, represented by the box under the time t_0, is the initial characterization of P by the NMI. That is, t_0 is the time that P is first considered available for use. The primary measurement standard P could be a measuring instrument, a reference material, a material measure or a measuring system [1]. For purposes of discussion here, P will be taken to be the most general type of measurement standard, a measuring system. The same basic principles concerning traceability would apply if P were any of these other types, although the details might be different. The initial characterization of the primary measurement system P is based on first-principles, "without reference to other standards of the same quantity," by definition [1]. Such a characterization also involves evaluating the uncertainties associated with using P to make measurements of the quantity that P is designed to measure. Further discussion of special considerations associated with characterization of a primary measurement system will be presented later.

Once the primary measurement system P has been characterized, to be useful in the future its metrological characteristics must be "conserved" [1]. The second metrological event in Figure 1, represented by the two boxes connected by an arrow under the time t_1, is the calibration of an ensemble of control standards using P. The control standards must be of sufficient quality (stability, repeatability, resolution, etc.) that they can be used to detect changes in behavior or performance of P, using traditional measurement assurance techniques, at a level commensurate with that which P is to be used. Control standards with such properties can exist even when the standards cannot be characterized from first-principles and hence cannot be used as primary measurement standards themselves. Calibrations over time of the ensemble of control standards by P form the basis of a long-term internal measurement assurance system to conserve P.

The third metrological event, represented by the boxes under the time t_2, is a subsequent calibration of the same set of control standards using the same primary measurement system P. By plotting a set of measurement results obtained at times t_1 and t_2, a measurement assurance chart (or measurement control chart) for the entire system of standards is begun. By again repeating the same measurements and monitoring the variation in the measurement results over time, an estimate of the long term stability and repeatability of the system, and in particular of P, can be formulated. This entire system of standards can also be used at some later point in time to validate the immediate operational integrity of P. As will be discussed further below, the stability and repeatability of the entire system of standards become important components of uncertainty in a final statement of traceability. Note that the measurement assurance method described here may not always be applicable to a primary measurement system, but related methods that accomplish the goal of monitoring the integrity of the system over time must be developed and used.

Simple Metrological Timelines for Traceability

Figure 2a illustrates a slightly more complicated metrological system than that in Figure 1. In this case, a measurement artifact is shown explicitly as part of the internal measurement assurance system used to monitor the stability of the primary measurement system P. The measurement artifact (or "material measure" [1]), belonging to the NMI, is a "device intended to reproduce or supply, in a permanent manner during its use, one or more known values of a given quantity". This timeline introduces the measurement artifact to provide explicit reference to measurement results and measurement uncertainties. As indicated at time t_1, P is used to perform a measurement of the quantity X on the measurement artifact, with the measurement result x_1^P having "expanded uncertainty" [4] U_1^P. At about the same time t_1, the ensemble of control standards (N_i, where i is an index representing the number of control standards in the ensemble) is used to make measurements of the same quantity X, with measurement results $x_1^{N_i}$ having expanded uncertainties $U_1^{N_i}$. Similarly, at time t_2, P is again used to perform a measurement of the same quantity X on the same measurement artifact, with the measurement result x_2^P having expanded uncertainty U_2^P, and the same set of control standards (N_i) are used to make measurements of the quantity X, with measurement results $x_2^{N_i}$ having expanded uncertainties $U_2^{N_i}$.

An illustrative measurement assurance (control) chart of the type described above is presented in Figure 3a. This simple chart records measurement results (X, indicated by the dots) and expanded uncertainties (U, indicated by the error bars) for the primary measurement system P and two different control standards (N_1 and N_2) at the two times t_1 and t_2. Such data demonstrate the functional integrity of the full system of instruments (which includes P, the control standards and the measurement artifact), within the scatter of the data and their uncertainties, over the time period covered by the chart. Note that in order for such a system to work most effectively, the control standards should be of differing designs from each other and from P whenever possible, making it less likely that changes in their individual performances over time would be correlated with each other's, or with possible changes in the primary measurement system. However, in many cases a single control standard is sufficient to demonstrate whether or not the measurement system is under control. Also note that while the simple, illustrative chart in Figure 3a contains data for only two times, charts used in practice will usually contain data at numerous times to allow long-term monitoring of the system.

While the example in Figure 2a and Figure 3a is given for a primary measurement standard in an NMI, there is also a need for the same type of internal measurement assurance system for the standards used by other laboratories, such as a calibration laboratory that is a customer of the NMI, as indicated in Figure 2b, and the control chart in Figure 3b.

The measurement results indicated in Figure 2b can be used to illustrate an example of traceability for internal measurement assurance. The measurement result x_1^C is directly traceable to the calibration laboratory's reference standard C, in its state at time t_1, through documentation of all relevant aspects of the measurement procedure, including the expanded uncertainty U_1^C. Sometime later, the measurement result x_2^C is directly traceable to C, in its state at time t_2, through documentation of all relevant aspects of the measurement procedure, including the expanded uncertainty U_2^C. While this example is not the most customary use of the concept of traceability, which is to have measurement results related to national or international standards, it serves to demonstrate that traceability can occur at any level. In this example, traceability of the measurement results x_1^C and x_2^C to national standards could be achieved if C were calibrated by the NMI.

Note that while traceability is usually regarded as relating measurement results to specific standards (e.g., instruments or systems), the relationship must also include the many aspects of the entire measurement process (such as environmental conditions) that affect the overall measurement uncertainty. *In future discussion in this paper, the shorthand notation of saying that a measurement result is traceable to a standard implies that the entire measurement process is being considered.*

The simple example in Figure 2b contains an aspect of traceability that is frequently ignored but must always be considered: the possible time dependence of the performance of the reference standard C when claiming traceability. Strictly speaking, the measurement result x_2^c is traceable to the standard C as it existed at the time t_2, but not necessarily as it existed at the time t_1. As an example of why such distinction is necessary, if in the period between times t_1 and t_2 the reference standard C was somehow modified (e.g., damaged), or the uncertainty associated with its use was somehow changed, then the measurement result x_2^c and the expanded uncertainty v_2^c may not be related to the state of C at time t_1 in a known or well-understood way. Under such circumstances, it would not be reasonable to claim traceability of the measurement result x_2^c to C as it existed at the time t_1.

Data of the kind shown in Figure 3c would indicate that the performance of the reference standard C had changed between times t_1 and t_2. That is, the value of the measurement result x_2^c obtained at time t_2 is significantly above the values of all of the other measurement results. In this case C has shifted by an amount $\delta x^c = x_2^c - x_1^c$. In order to claim traceability of the measurement result x_2^c obtained at time t_2 to the reference standard C as it existed at time t_1, the calibration laboratory would have to incorporate δx^c, preferably as a correction to the measured value in the statement of traceability, *or as an additional component of uncertainty (δv^c) associated with the statement of traceability*. Note that if the calibration laboratory had not performed the measurements and displayed the results in Figure 3c, it would have remained unknown that a change in the performance of C had taken place, and subsequent claims of measurement values or uncertainties in statements of traceability would be in error.

More Complex Metrological Timelines for Traceability

Figure 4 is a metrological timeline depicting the relevant metrological events for traceability of a measurement performed by a calibration laboratory to an NMI. As indicated in the figure, the calibration laboratory wishes to establish traceability of a measurement result x_m^c, obtained while using the calibration laboratory's reference standard C at the time t_m, to the primary measurement system P belonging to the NMI. As also indicated in the figure, relevant metrological events for the traceability of the measurement result obtained at time t_m have already taken place at the earlier times t_b, t_c and t_d. The time t_c is the time when the NMI calibrates C using P. The time t_b is a time prior to time t_c when C has been characterized in the calibration laboratory as part of an internal measurement assurance process that incorporates the calibration laboratory's measurement artifact and control standards, as described above. This step at time t_b is extremely important in establishing confidence in the integrity of the traceability statement, since it allows the calibration laboratory to verify and demonstrate that C is not damaged or otherwise adversely affected beyond acceptable limits during its journey to and from the NMI. Such verification is accomplished by using C at time t_d, after it is returned to the calibration laboratory, to calibrate the same measurement artifact, along with the same set of control standards, as was done at time t_b, as illustrated in the figure. The thin dashed arrows in the figure are to aid in following the sequential use of C along the timeline.

In Figure 4, the traceability is indicated schematically, by the heavy arrow, as relating the measurement result x_m^c, obtained at time t_m, to the standard P as it existed at the time t_c. For simplicity in the figure, the traceable measurement result x_m^c is shown being obtained during the course of taking data for internal measurement assurance purposes. If, instead, the reference standard C had been used to perform some other measurement at time t_m for which traceability to P was desired, then it would have been important to perform yet another internal measurement assurance operation (i.e., taking more data) afterwards, using the same measurement artifact and control standards. This last step would be to verify that C was still performing within acceptable limits after the traceable measurement at time t_m, and hence was likely doing so at the time t_m as well.

A metrological timeline highlights the key elements of a traceability relationship. For more complicated traceability relationships, the utility of a metrological timeline to provide a "traceability roadmap" becomes even more apparent, as illustrated in Figure 5. This figure depicts a generic "lower-level" laboratory sending its reference standard L to a generic "higher-level" laboratory for calibration against the higher-level laboratory's reference standard H. The measurement assurance systems of both the lower-level laboratory and the higher-level laboratory are explicitly indicated, although explicit use of measurement artifacts in either laboratory is suppressed in the figure for simplicity. Depending upon the likelihood that the calibration of H has changed significantly between times t_c and t_m, for reasons discussed earlier, the lower-level laboratory might wish to demonstrate traceability of the measurement result to H as it existed at the time t_m (indicated schematically by the heavy arrow). However, the calibration laboratory may also desire a traceability statement relating the measurement result to H as it existed at time t_c, since that is when the lower-level laboratory's reference standard L was actually calibrated against H. Either of these traceability statements is possible; however, both the measurement values and the uncertainties associated with the traceability statements may be different for the different cases, as discussed earlier. Having a metrological timeline like that shown in Figure 6, where both

traceability paths are indicated on the same page (as Traceability$_1$ and Traceability$_2$), could aid greatly in assisting someone, such as a measurement auditor, to visualize the difference between the two possible traceability statements.

STATEMENTS OF TRACEABILITY

As discussed in the introduction, the use of traceability is primarily to answer the questions: "By how much should the measurement result that I obtain today, using my instrument, be corrected so that it is consistent with the measurement result that I would have obtained today if I could have used the instrument (standard) to which I want my measurement to be traceable? What is the uncertainty of this corrected measurement result?"

The examples given in earlier sections demonstrate how the clear and rigorous identifications of metrological events and measurement relationships help, for even the simplest traceability statements, to answer these questions. One must define and describe all of the parameters needed to demonstrate the unbroken chain of measurement and uncertainty relationships between the measurement for which traceability is claimed and the standard to which traceability is claimed. Metrological timelines, measurement assurance (control) charts, and records detailing all relevant metrological parameters associated with the instruments or standards involved at each step along the way are important tools required to describe unambiguously how the calculated uncertainty associated with the measurement for which traceability is claimed has been evaluated.

On the practical side, while it is important to address the issues discussed above, the degree to which measurements and relationships must be documented may vary considerably. For instance, less attention can be given to a standard's instability if the changes are small when compared to the uncertainty of the measurement. However, it is not wise to totally ignore the performance of the reference standard, since it may have undergone a serious change in performance if it was inadvertently damaged.

Components of a Practical, Rigorous Statement of "Simple" Traceability

While practical considerations cannot be disregarded, it is always useful for completeness, and to make sure that nothing has been overlooked, to at least list all of the metrological events and other issues that must be considered at some level in documenting the traceability of a measurement result. The key elements of a general statement of traceability for the relatively simple examples that have been presented above can be summarized as follows:

A full statement of traceability of a measurement result will contain components of the following kind:

1) Provision of a complete metrological timeline (similar to those in Figures 4-6, with accompanying descriptive text) illustrating and identifying all of the relevant physical components, including control standards, and measurement assurance measures used to demonstrate the traceability of the measurement result and the integrity of its estimated uncertainty. The metrological timeline serves as a visual roadmap to help follow the narrative statement of traceability.

   Note: It is important to document how control standards are used to ensure that no instruments or systems, especially those that are moved or transported, experience a significant shift in their performance over time. In particular it must be demonstrated, using the same control standards both before and after an instrument or system is shipped, that it performs in essentially the same manner after it is received as before it was shipped. For completeness, acceptable performance of the instrument or system should be verified following a measurement for which traceability is being demonstrated. Usually, this is done by comparison with control standards, documenting the procedure and result.

2) Description of all of the metrological details associated with the measurement, including what was measured, the result of the measurement, the instrument(s) or system(s) used, when and where the measurement took place, the measurement environment, the results of all ancillary measurements and their estimated uncertainties, who performed and who was responsible for the measurement, what calculations, models or analyses were used to obtain the measurement result, and the uncertainty of the measurement result.

3) Definition of the standard to which the measurement result is to be traceable, including the point in time in the existence of the standard at which the traceability is being established, and all metrological details (as described above in 2) of the standard that influence the uncertainty of the measurement result.

   Note: If the uncertainty, and any change in uncertainty, associated with the standard are much smaller than the uncertainty of the measurement result for which traceability is being documented, then only a brief description of the measurement

history of the standard is needed as long as the standard performed within expected limits when the lower-level laboratory's standard was compared to it.

4) Provision of the uncertainty analysis, including supporting documentation, such as test results and measurement assurance (control) charts, used to calculate the estimated uncertainty of the measurement result for which traceability is being demonstrated. If there is an "additional" component of uncertainty (such as δu_c above) associated with the point in time that the traceability to a higher-level standard is being established, this uncertainty must be clearly identified, and its incorporation into the overall statement of uncertainty described.

As discussed above, depending on specific requirements, statements of traceability may not need to contain all of these components. However, if a statement of traceability omits one or more of the components, it should be noted in the statement what components have been omitted, and why. In general, there is no such thing as "partial traceability." If any aspect of the measurement chain is not given due consideration and reported appropriately, then the credibility of the reported uncertainty of the measurement result in the statement of traceability is suspect.

Components of a Practical, Rigorous Statement of More Complex Traceability

The principles of measurement traceability discussed thus far can be applied fairly straightforwardly to situations where the measurement result is not directly traceable to the desired standard. This most commonly occurs when there are intermediate laboratories in the chain of comparisons used to demonstrate traceability. The added complexity gives rise to several new issues.

Perhaps the most important of these has to do with responsibilities of record keeping and providing information, as can be demonstrated with the aid of the metrological timeline shown in Figure 7. Pictorially, in the center of this figure, a testing laboratory obtains a calibration of its standard T from the lower-level laboratory at time t_t. The testing laboratory subsequently performs a measurement using the standard T at time t_m and wishes to demonstrate traceability of that measurement result to the standard H of the higher-level laboratory.

In order for the testing laboratory to assess the measurement uncertainty associated with the measurement result at time t_m, the uncertainty ($u_{t_m}^{T}$) associated with the standard T at time t_m must be known. This latter uncertainty can be evaluated in the testing laboratory from the control charts maintained on the standard T during the time period from t_t, when the standard T was calibrated by the lower-level laboratory's standard L and then returned to the testing laboratory, to the time t_m. If the time-average of the measurement quantity x^{T} (denoted $\bar{x}_{t_m}^{T}$), used in the control chart as a control parameter, changes (e.g. drifts) by an amount $\delta \bar{x}_{t_m}^{T}$ between t_t and t_m, then the testing laboratory can either "adjust" the values assigned to measurements made using T, or adjust the uncertainty assigned to T [5]. The original uncertainty associated with the standard T at the time t_t can be ascertained in the testing laboratory from the calibration report corresponding to calibration of the standard T against the lower-level laboratory's standard L at the time t_t. This calibration report should be provided to the testing laboratory from the calibration laboratory around the time t_t. The method used to incorporate $\delta \bar{x}_{t_m}^{T}$ into an overall uncertainty of the measurement result for which traceability is being established, whether it is the root-sum-square method [4] or another method (e.g., [5]), needs to be specified to avoid confusion.

The uncertainty associated with the lower-level laboratory's standard L at the time t_t can be assessed in a similar manner by the lower-level laboratory. This uncertainty can be estimated from the control charts maintained on the standard L during the time period from t_c, when the standard L was calibrated against the higher-level laboratory's reference standard H and then returned to the lower-level laboratory, to the time t_t. The original uncertainty associated with the standard L at the time t_c can be derived from the calibration report, issued by the higher-level laboratory, corresponding to calibration of the standard L against the standard H at the time t_c. Similarly to the case above for the testing laboratory, if the time-average of the measurement quantity x^{L} (denoted $\bar{x}_{t_t}^{L}$), used in the control chart as a control parameter, changes by an amount $\delta \bar{x}_{t_t}^{L}$ between t_c and t_t, then the lower-level laboratory can either adjust the values assigned to measurements made using L, or adjust the uncertainty assigned to L, when it is used to calibrate T.

A comprehensive statement of traceability of the measurement result at the time t_m thus requires, in principle, documentation of the performance history of the test standard T, the lower-level laboratory's standard L and, possibly, the higher-level laboratory's standard H. If the traceability of the measurement result is to be to H as it exists at the time t_m, then the quantity $\delta \bar{x}_{t_m}^{H}$, characterizing any change between the times t_c and t_m in the time-average of the measurement quantity x^{H} (denoted $\bar{x}_{t_m}^{H}$), used in the control chart as a control parameter for H, must be accounted for as an additional component of uncertainty associated with the measurement result in the statement of traceability. The testing laboratory's difficulty in assembling such a comprehensive statement of traceability is then twofold. First, the lower-level laboratory does not typically provide the relevant performance history of the standard L in its calibration report, but only the uncertainty associated with the standard L at the time t_t. However, better laboratories (especially those that have undergone an accreditation process) will be able to provide such information, covering a reasonable period of time, upon request. Second, for a system of standards only slightly more complex than that

indicated in Figure 7, or for traceability paths covering a span of several years, it could prove difficult to identify the standard H in the higher-level laboratory, especially if it has undergone modification, and harder yet to obtain access to the quantity δx^{H}_{unc}, thus adding to the difficulty of assembling a comprehensive statement of traceability.

Fortunately, in many cases requiring traceability, these issues do not materialize due to the increasing levels of acceptable uncertainty as one descends the laboratory hierarchy. For example, if the testing laboratory in Figure 7 only requires modest uncertainties when using the reference standard T, whereas the typical variation δx^{L}_{unc} in the reference standard L in the lower-level laboratory is significantly less than this uncertainty over a time period greater than $(t_t - t_c)$, and the typical variation δx^{H}_{unc} in the reference standard H in the higher-level laboratory is even much smaller over a time period greater than $(t_m - t_c)$, then the testing laboratory probably does not need to incorporate either of these variations into the uncertainty associated with the traceability of the measurement result using T at time t_m. However, if either δx^{L}_{unc} or δx^{H}_{unc} are similar in magnitude to the uncertainty associated with using T, then they must be incorporated into the final uncertainty of the measurement result using T at time t_m in the statement of traceability.

The hierarchy of measurement and testing laboratories (national lab, secondary labs, tertiary, etc.) is such that, ordinarily, a laboratory needs to go only one level up to get the necessary calibration uncertainty, but usually will need to have traceability to more than one level up. For instance, in the example of Figure 7, the testing laboratory should only have to go to the lower-level laboratory to get the calibration uncertainties it needs, but will have to obtain information from the higher-level laboratories to have traceability to national standards.

If the testing laboratory had needed to obtain a smaller uncertainty, however, it could have sent its standard T directly to the higher-level laboratory for direct calibration against the standard H shortly before the measurement result required at the time t_m was obtained. This is frequently not possible for reasons of cost and time. When possible, however, such a procedure would allow the testing laboratory to assess how closely the measurement results agree for the two traceability paths, as well as how realistically the uncertainty evaluation of the measurement result at the time t_m was carried out using the original traceability path. This would be useful in lending credence to using the longer traceability path in the future. The use of "blind" measurement assurance programs, where the laboratory being evaluated carries out test calibrations without being told anything special in advance in order to assess the capabilities of the laboratory's entire measurement assurance process, accomplishes similar objectives.

OTHER ISSUES CONCERNING STATEMENTS OF TRACEABILITY

Traceability when more than one Standard is used for a Calibration

Sometimes a lower-level laboratory's measurement standard L sent to a higher-level laboratory for calibration requires that more than one reference standard H be used by the higher-level laboratory to perform the calibration adequately. The reference standard H is taken here to be a measuring instrument. Such is the case, for example, when the operating range of L does not overlap well with any of the standards H in the higher-level lab. Ehrlich, Eberhardt et. al. [6] have described a statistical algorithm for deriving the measurement uncertainty in such a situation for pressure standards. Under these circumstances the traceability of a measurement result is not to an individual instrument, but rather to a complex measurement system as discussed earlier, consisting of the measurement instruments that are used, combined with whatever analysis is used to derive the uncertainty statement in the calibration report associated with the lower-level laboratory's standard L. Care must be taken to properly develop and document the measurement assurance (control) charts associated with these measurement systems for purposes of traceability statements associated with subsequent use of the lower-level laboratory's reference standard L.

Intrinsic Standards and Traceability

Another complex issue concerning traceability is the use of intrinsic standards. The *ANSI/NCSL Z540-1-1994, American National Standard for Calibration - Calibration Laboratories and Measuring and Test Equipment - General requirements* [7], says that intrinsic standards are "based on well-characterized laws of physics, fundamental constants of nature, or invariant properties of materials and make ideal stable, precise, and accurate measurement standards if properly designed, characterized, operated, monitored and maintained." While many people tend to think of intrinsic standards as stand-alone, turn-key systems that require no prior comparisons while still providing inherent traceability, the ANSI/NCSL Z540-1 states otherwise: "Where intrinsic standards are used, the laboratory should demonstrate by measurement assurance techniques, interlaboratory comparisons, or other suitable means that its intrinsic standard measurement results are correlated with those of national or international standards." In other words, intrinsic standards are different than ordinary transfer standards in that they may be characterized in much the same way as primary standards. However, in order for a measurement result using an intrinsic standard to be traceable to a national standard, the intrinsic standard must still be compared with the national standard, and appropriate measurement assurance techniques must still be implemented.

Multiple Routes to Traceability

When a calibration laboratory requires direct traceability of a measurement result to a reference standard in an NMI for one of the SI base quantities (mass, length, time, etc.), the calibration laboratory must go directly to the organization in the NMI that provides such measurement services. But if a calibration laboratory requires direct traceability to an NMI for a measurement result of a derived quantity (e.g., pressure), then the calibration laboratory can follow two basic pathways. One is to have a standard calibrated against a reference standard for the derived quantity maintained at the NMI. The other is to obtain calibrations from the NMI for the base quantities needed to support development of a primary standard themselves.

The first, most straightforward option, is to go to the organization in the NMI that provides measurement services for the derived quantity. This organization provides such capability by developing primary standards based on measurement results that are themselves traceable to reference standards, maintained by other organizations in the NMI, that are representations of the SI base units. These representations are in turn based on realizations of the definitions of these units. Note that while traceability to a reference standard that is a representation of an SI unit is possible, it is not appropriate to refer to traceability to the SI unit itself, except possibly for mass where the SI unit is defined in terms of an artifact standard. The term "expressibility" of a measurement result in terms of SI units is preferred [8].

The second option mentioned is to characterize a primary standard in-house at the calibration laboratory by obtaining measurement services for the base quantities directly from the NMI. Alternatively, the calibration laboratory could obtain a primary standard that another laboratory has characterized using measurement services obtained directly from the organizations in the NMI that develop and characterize reference standards that are representations of the SI base units. Examples of both of these options can be found in practice.

While these options may both satisfy the requirement that a measurement result be directly traceable to an NMI, it is important to note that the final measurement results and associated uncertainties may differ for these options. This is because the primary standard developed by the calibration laboratory may be different from the primary standard developed by the NMI. Even if the primary standards are of identical design, the implementations or models used for assessment of the final measurement results might differ.

The use of comprehensive statements of traceability that contain metrological timelines of the types described above should provide ample opportunity to understand which traceability path is being used by the calibration laboratory, and what assumptions are being made.

Recalibration Intervals

Related to the issue of traceability is the question of the frequency with which instruments should be recalibrated. Natural wear on an instrument due to the "hardness" and frequency of use, mishandling, environmental factors such as corrosion, and even the way an instrument is used, all have a bearing on instrument performance. A significant change in instrument performance, or an uncertainty not within desirable limits, will typically warrant recalibration of the instrument. However, as discussed at length in reference [9], the cost of frequent recalibration balances the economic (and other) advantages of keeping an instrument within desirable limits of uncertainty.

An appropriate recalibration interval can be established by reference to the control chart which results from routine comparison with control standards. Furthermore, abnormalities can be quickly spotted and corrected by means of repair and recalibration. Determining when to recalibrate an instrument by using control standards usually results in less frequent recalibrations, saving time and money. Of course, the cost of purchasing and/or developing, using and maintaining control standards must be considered in the cost accounting, but when traceability is required, the control standards must be used and become part of the cost of doing business anyway.

CONSIDERATIONS AT THE INTERNATIONAL LEVEL

The explicit examples presented above using metrological timelines to portray the unbroken chain of comparisons in traceability relationships apply specifically within a nation. In the growing global economy, the questions posed earlier at the root of domestic traceability requirements, namely "By how much should the measurement result that I obtain today, using my instrument, be corrected so that it is consistent with the measurement result that I would have obtained today if I could have used the instrument (standard) to which I want my measurement to be traceable? What is the uncertainty of this corrected measurement result?", also apply to measurement relationships that cross national boundaries. That is, someone performing a measurement in one country

may need to know or demonstrate how the result of that measurement relates to what the result of that measurement would be if carried out by the NMI (or a calibration laboratory) of another country. While the concepts of traceability discussed above may sometimes be applicable to this situation, this is frequently not the case since NMIs do not typically calibrate each other's instruments, but rather compare measurement capabilities through international intercomparisons or round robins using intermediate or transfer standards. Depending upon the details, results from such intercomparisons could sometimes be used to establish traceability to another nation.

It is becoming more common to hear the terms "equivalency" and "horizontal traceability" being used to describe the metrological relationships when national boundaries are crossed, since the measurement capabilities of the various NMIs are presumed to be at a more-or-less equal (or horizontal) level. The term "vertical traceability" is then usually reserved for the more common usage of domestic traceability described in the main text above. While the concept of horizontal traceability is not developed further here, it can be noted that metrological timelines to describe horizontal traceability will be qualitatively different than those for vertical traceability. This is because for vertical traceability the results of measurements, as well as the uncertainties, are forwarded from one calibration level to the next. For horizontal traceability the results of measurements are typically not forwarded as a calibration. Rather, the results of measurements are forwarded as being unchanged from one NMI to the next, and an "international comparison uncertainty," representing the "degree of equivalence" of the national laboratories involved, is included in the statement of traceability. Another factor that limits the potential usefulness of horizontal traceability is the level of acceptance of the measurement results and uncertainties by the various participants.

A point mentioned earlier, but worth reemphasizing here, is that, strictly speaking, in the VIM definition, traceability is the property of the result of a measurement or the value of a standard, but not the property of an instrument or a laboratory. Thus, within this conventional definition, it is not proper to think of an NMI being traceable to another NMI, even though measurement results could, in some cases, be established as traceable to another NMI. From this perspective, the term "equivalence" of national laboratories in particular metrological areas is preferred.

As noted earlier, it is not within the scope of this paper to develop a formalism using metrological timelines for describing the metrological relationships corresponding to traceability across national boundaries. To minimize confusion, words other than traceability should probably be used to describe the relationship between the result of a measurement in one country's NMI and the corresponding (hypothetical) result of the same measurement carried out by the NMI of another country if a direct link of calibrations (or equivalent for chemical or other standards) cannot be demonstrated. The International Bureau of Weights and Measures (BIPM) is in the process of developing a mechanism by which nations' abilities to perform nominally identical measurements can be compared, and the results published [10].

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ACKNOWLEDGMENTS

The authors would like to thank N. Belecki, S. Carpenter, S. Chappell, G. Harris, R. Hebner, C. Kuyatt, W. Leight, S. Morris, H. Semerjian, and B. Taylor for their useful comments concerning this paper.

Figures

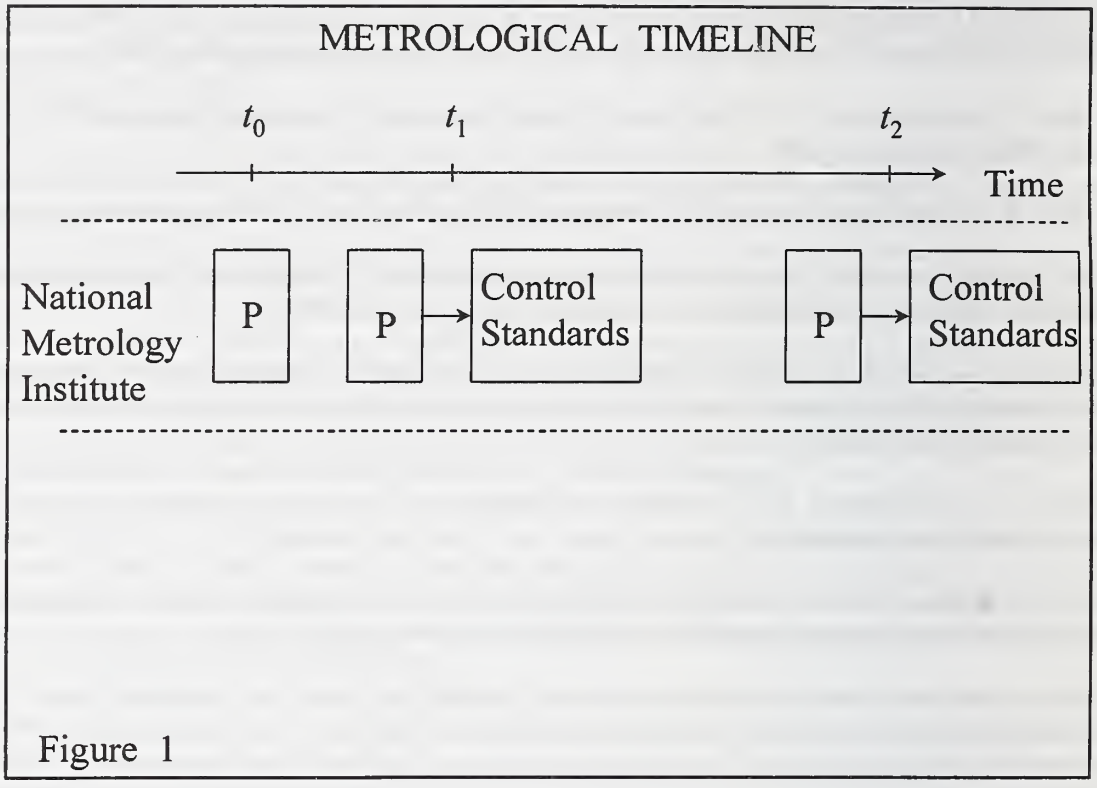


Figure 1

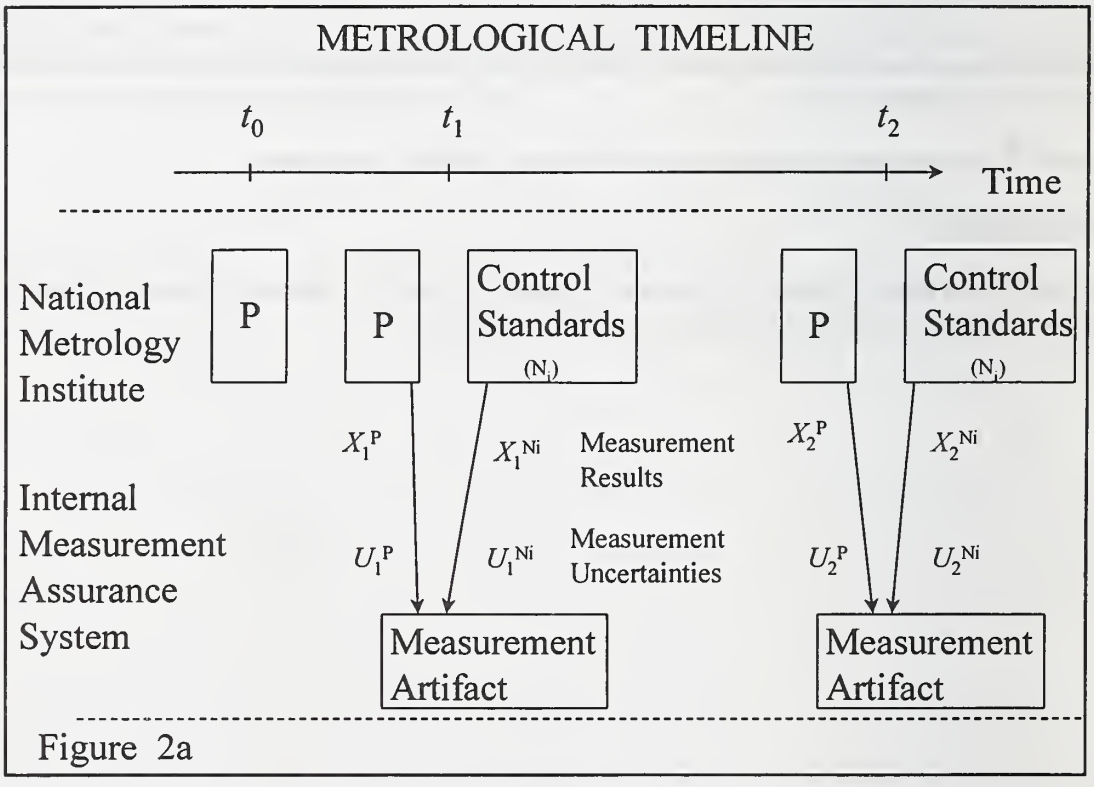


Figure 2a

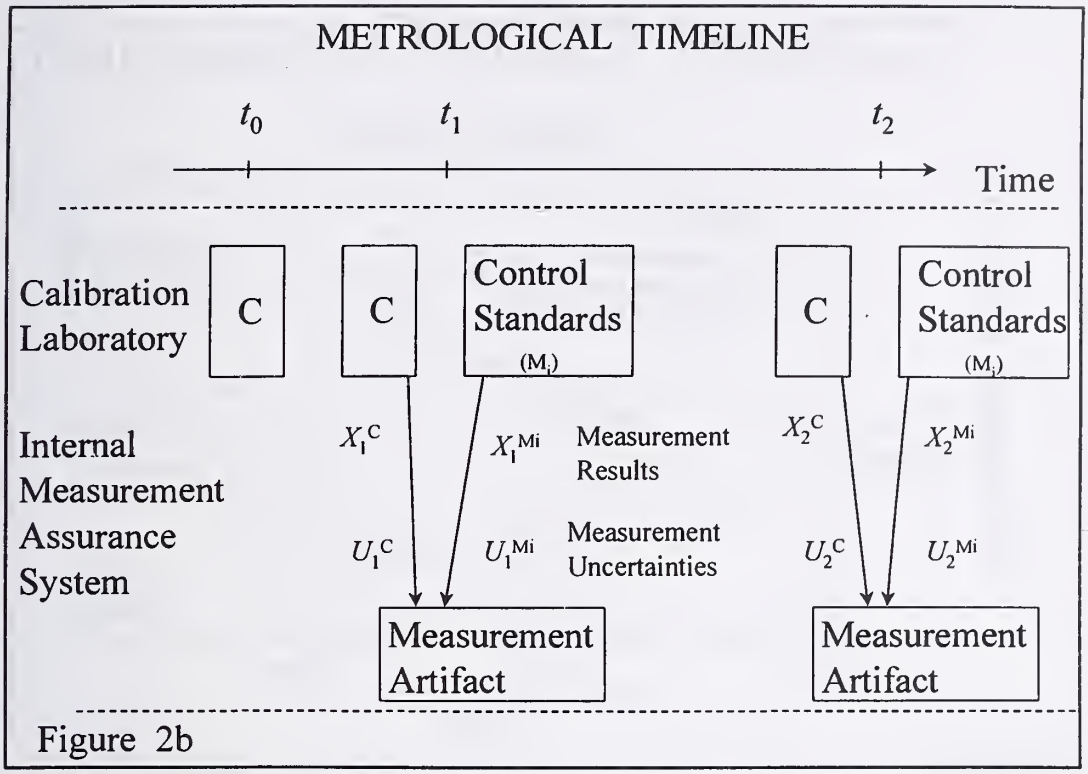


Figure 2b

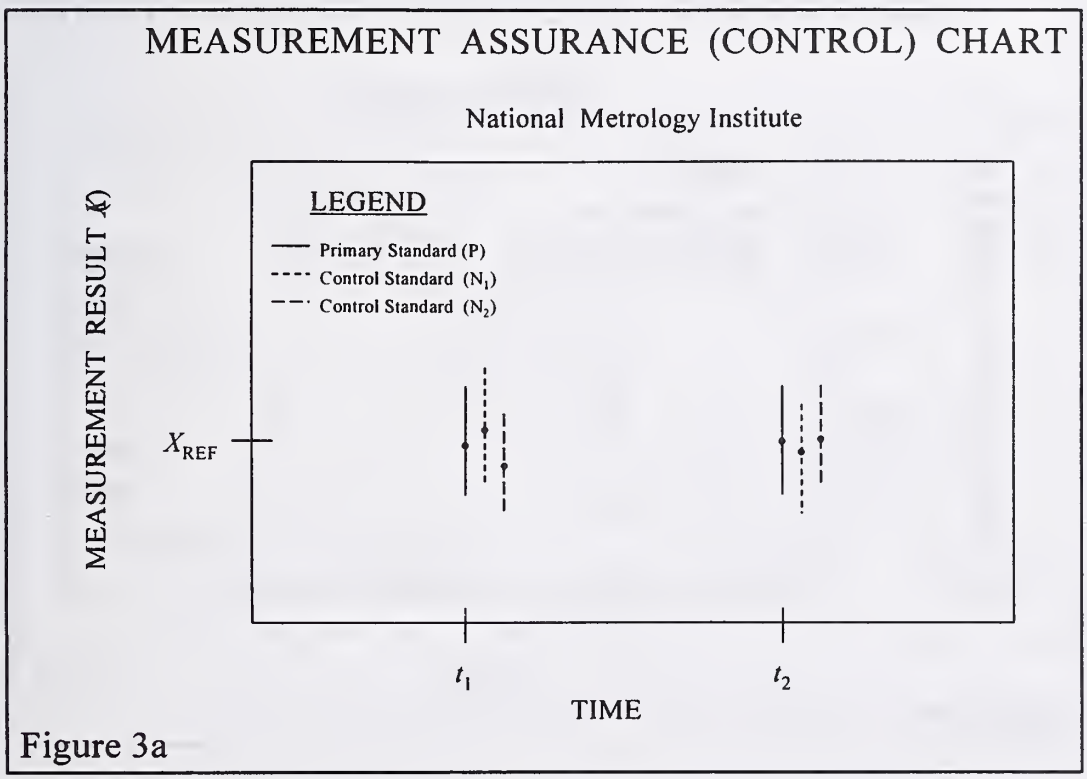


Figure 3a

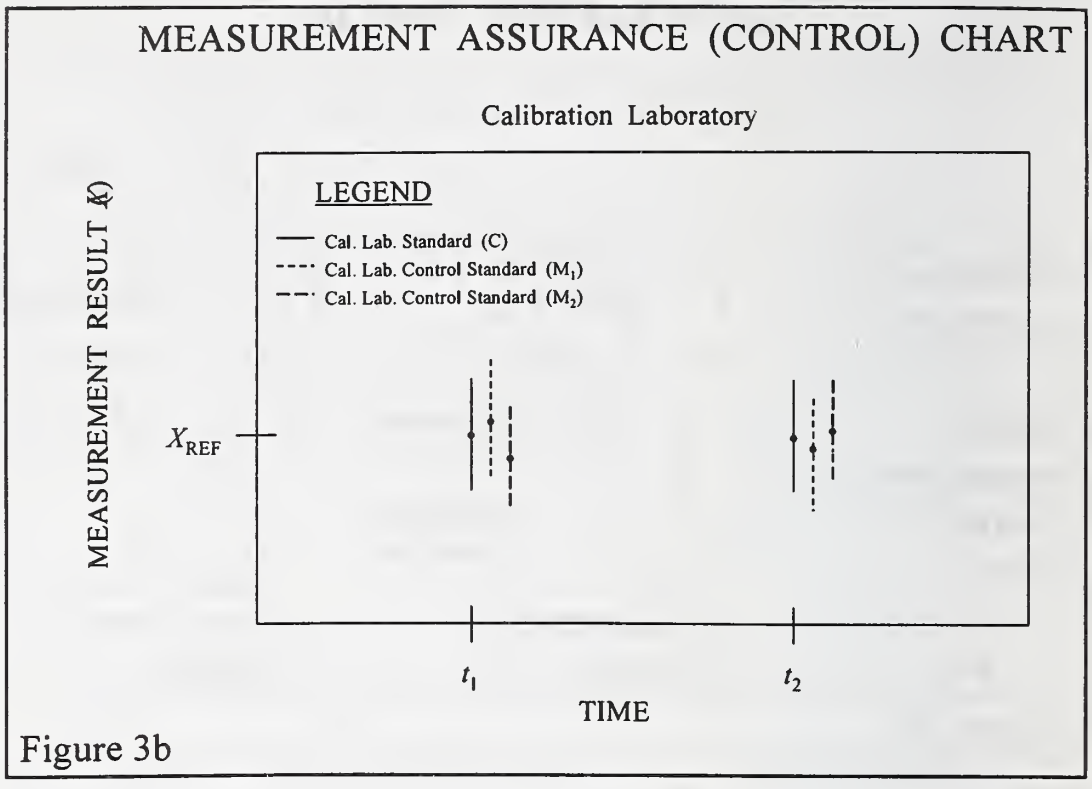


Figure 3b

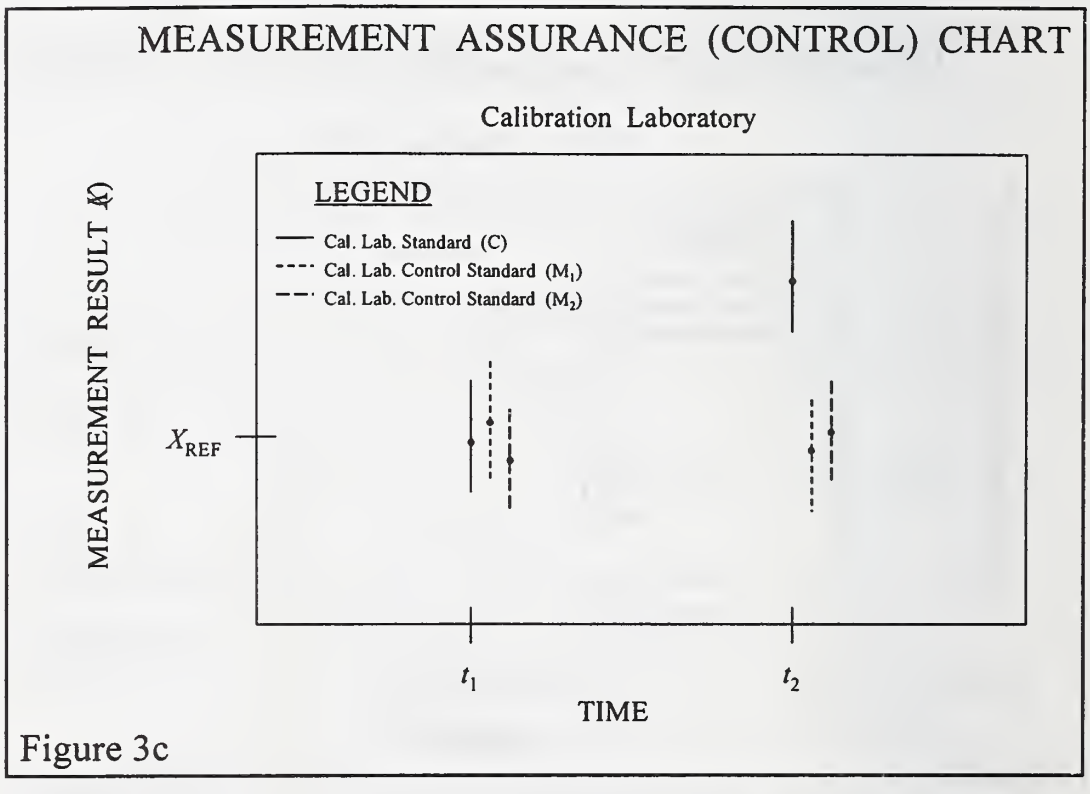


Figure 3c

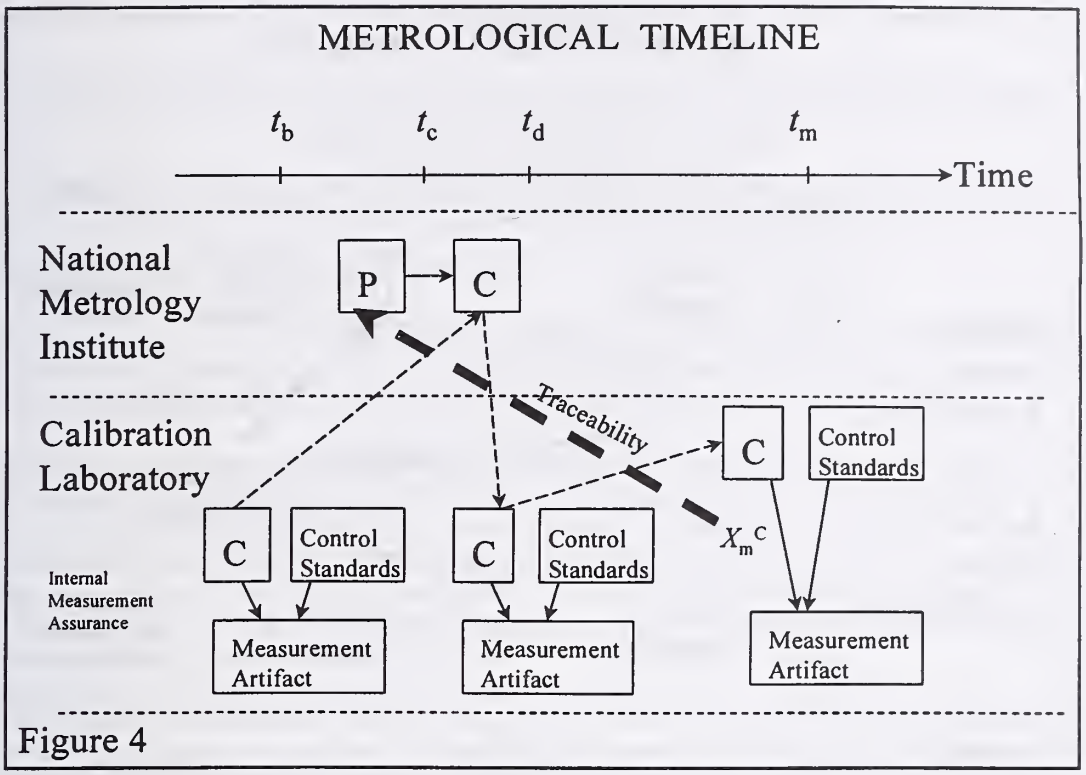


Figure 4

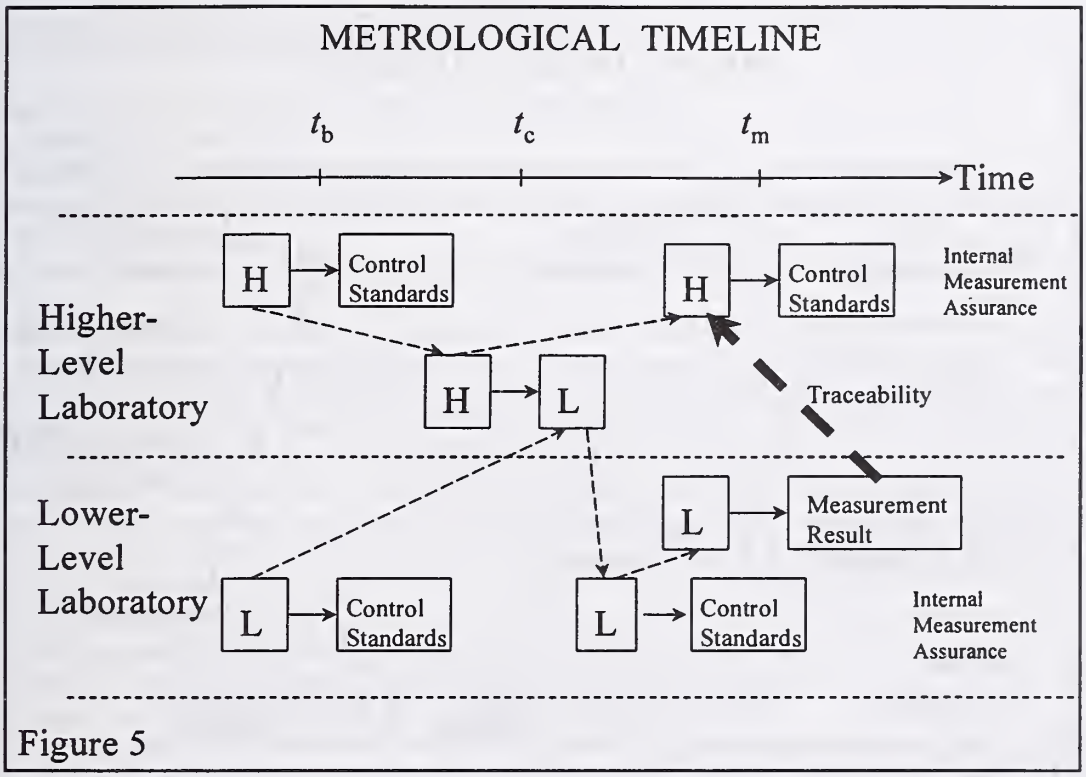


Figure 5

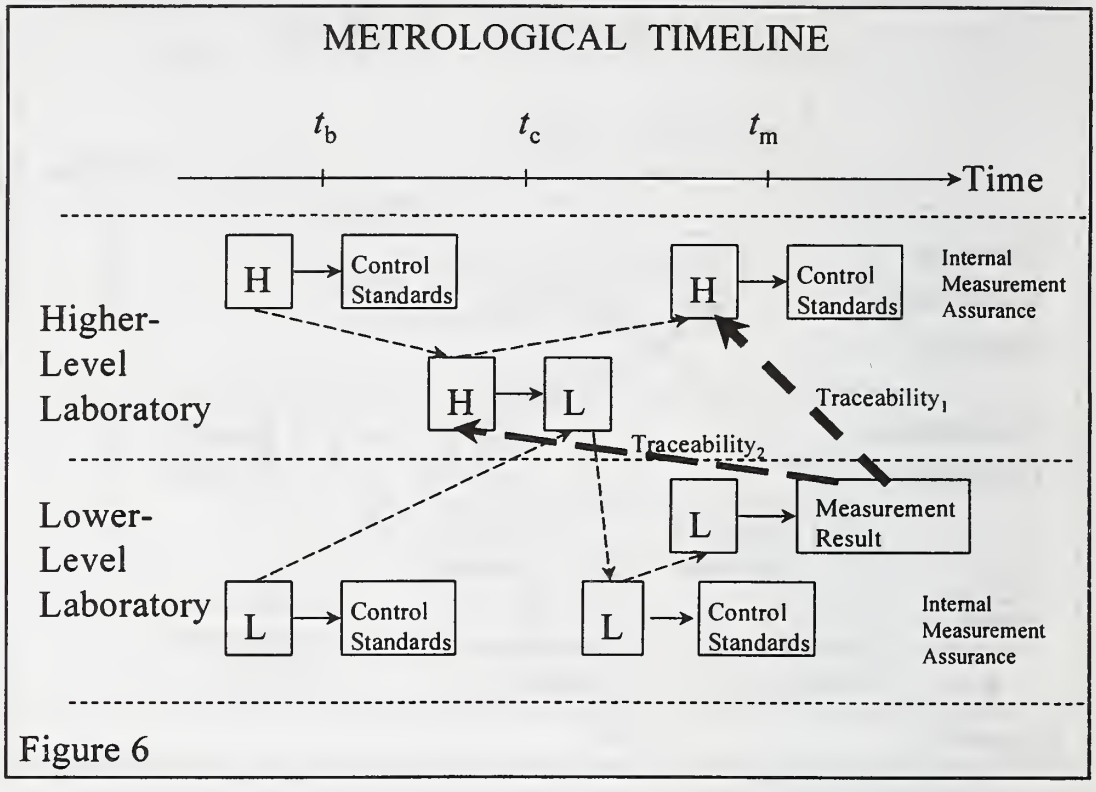


Figure 6

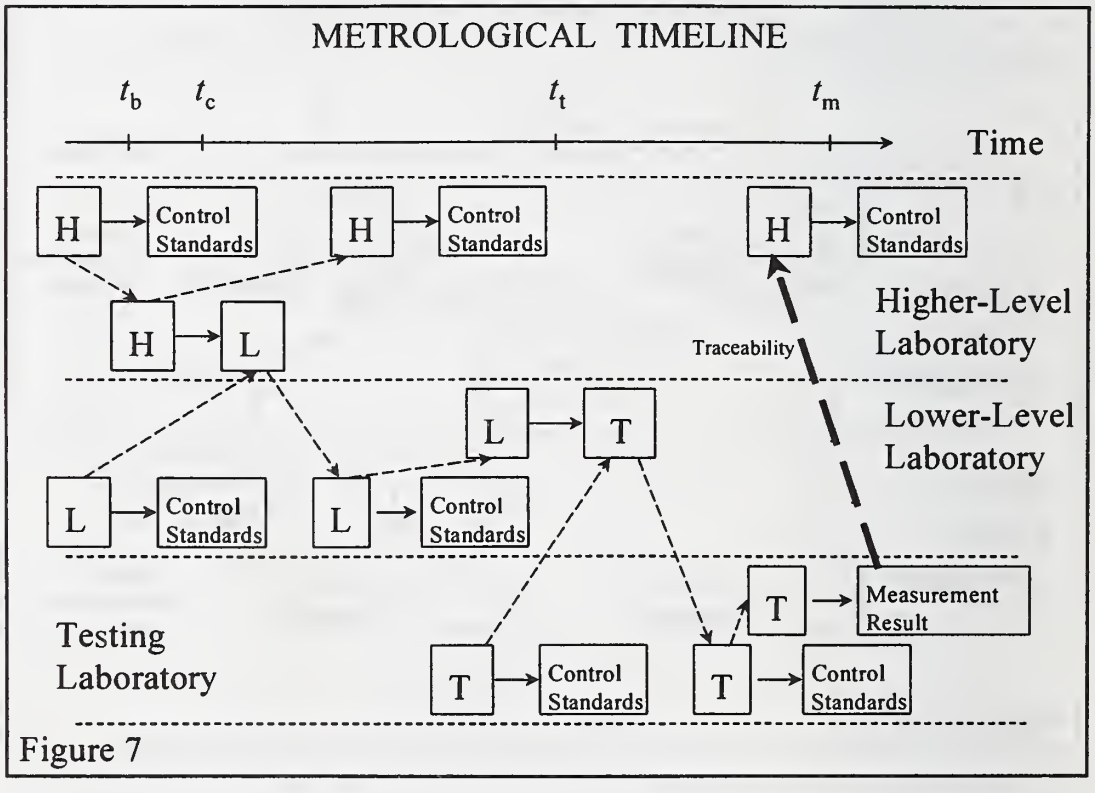


Figure 7

Appendix B

Railroad Test Car Calibration, Intercomparisons, and Custody Transfer

Meeting Summary Report, March 20-21, 1997
Prepared by: Georgia Harris, NIST
(with input from notes from Tina Butcher, Diane Lee, and editorial comments from L.F. Eason)

Overview of Meeting Objectives and Outcomes

The development of an intercomparison of railroad test car calibrations between the United States and Canada was requested of NIST staff Tina Butcher, G. Diane Lee, and Georgia Harris by Renald Marceau and Sonja Roussy, both of Measurements Canada at the 1997 Interim Meeting of the National Conference on Weights and Measures (NCWM).

The National Institute of Standards and Technology (NIST) in the United States and the National Research Council (NRC) in Canada have an agreement of measurement equivalency at the kilogram level which was signed in 1991. Issues regarding traceability to NIST and NRC have been raised in the past where State laws require traceability to NIST and test car calibrations have been conducted by Canada. Some States already recognize tests conducted in Canada. Canada is now proposing to gather data to be used in the support of a mutual recognition agreement. The duplication of calibrations of railroad test cars being done in both Canada and the United States could be eliminated once Canada and the United States have a mutual recognition agreement regarding the equivalency of the test car calibrations.
In addition to the previous request, Steve Malone, Director of Weights and Measures in Nebraska sent a letter to L.F. Eason (NC) as Chair of the Metrology Subcommittee of the NCWM regarding the control of standards used in testing railroad scales dated November 26, 1996. The standards in this case are railroad test cars, some of which belong to the United States Department of Agriculture (USDA) Grain Inspection and Packers and Stockyards Administration (GIPSA), some belong to the States of Minnesota, Oregon, and Washington, with the rest belonging to independent railroads or contractors. The concern of control and verification of calibration was specifically identified, particularly in the case of routine repairs and modifications, and in the case of contractors handling the process rather than railroad officials.

A meeting was scheduled for March 20-21, 1997, to discuss the following:

- the potential for a round robin;
- discussion of calibration procedures in use;
- investigate how the systems of traceability operate in the United States and Canada from the national laboratory down to the railroad scales; and
- the control of railroad test cars between calibrations and reciprocal acceptance of calibration certificates.

The major difference in the calibration of railroad test cars between Canada and the United States is that Canada performs a substitution test with known weights on an acceptable railroad scale under specified environmental conditions. The United States uses a system where 13 Master Scales, which are in enclosed facilities, and are calibrated by the USDA on an annual basis. The Master Scales are then used in a direct reading method for the calibration of railroad test cars. In Canada, regulatory authority is maintained by Measurements Canada. A clearer picture of the distribution of authority within the United States was developed through discussion among the parties present at the meeting. Much remains to be clarified regarding State and local regulatory responsibilities as raised and discussed at this meeting. Regulatory authority and responsibilities for measurement traceability and uncertainty in the United States are distributed among NIST, USDA, States, AAR, Railroads, and independent contractors.

A number of action items were assigned to the participants attending the meeting with the following next steps:

- the round robin was begun March 21, 1997, at the USDA Master Scale Depot;
- additional documentary materials will be gathered, evaluated, and circulated;
- data regarding the Master Scale and test car calibrations will be evaluated;
- a forum has been scheduled for the NCWM Meeting on July 21, in Chicago, to inform attendees of how the system currently works, what controls are in place, and to discuss the data from the Master Scales, test cars, and round robin if it has proceeded quickly enough.

Detailed Meeting Summary
March 20 - 21, 1997

General Topics
- Test Car Calibration
- Calibration Procedures
- Tour of Master Track Facility and Demonstration of Calibration
- Custody Transfer - Control of Standards

Materials Distributed
U.S. Department of Agriculture (USDA) Grain Inspection and Packers and Stockyards Administration (GIPSA)
- Background of Program - History
- Program Operation; Field Calibration and Scale Tests
- Master Scale List (showing locations and owners of the scales)
- AAR Handbook Part 4, recommended corrections/additions
- GIPSA Weighing Handbook, Test Car Calibration, Field Calibration of Test Cars, 3-1 Weighing Design, Report of Calibration (has been updated), Report of Test
- Test Record and Report of Test for Master Track Scale
- Master Scale Depot - Test Car Data (as received and as released) (1989 to date)
- Master Scale Test Results (1989 to date)
- Draft Letter from Vic Gerber, WY

National Institute of Standards and Technology (NIST)
- Likely Participant List
- Interested Parties List
- Measurements Canada Bulletin M-19-E Draft
- Equivalence of Standards Agreement between U.S. and Canada for Mass at 1 kilogram, signed June 11, 1990
- Certificate of Calibrations - Canada, MN (has been updated)
- Miscellaneous Correspondence
- SOP 27, 3, 4, and 29 (Calibration of Railroad Test Cars, Double Substitution on Equal Arm Balance, Double Substitution on [other] Balance, Assignment of Uncertainty)

Overview of Meeting and Purpose - Reviewed agenda items and requests from Canada to NIST and Steve Malone (NE) to the National Conference on Weights and Measures, NCWM.

Overview of System in the United States (Input from G. Harris, Dick Pforr, and group)
The system in the United States involves NIST, USDA/GIPSA, some States, Railroads, and some contractors.

USDA/GIPSA - Background information in handout materials. NBS/OWM maintained the Master Scale Program and USDA took it over in joint cooperation with the American Association of Railroads (AAR) in 1981.

USDA has 2) 10,000 lb standards sent to NIST every 5 years (SS1, SS2) which are used with a platform scale at the Master Scale Depot to check annually all of the remaining 10,000 lb block standards loaded into the 3) USDA test cars (which are then used to test the 13 Master Scales on an annual basis). USDA primary responsibility is to test railroad track scales used to measure grain; also has responsibilities for testing master scales and completes other tasks on a cost-recovery basis..

As found and as left data is available for all 13 Master Scales and Test Cars that USDA has tested since 1989. However, as found data on the test cars is usually after repair if it has been done (i.e., data is really as received). USDA does not test cars between December and March 1.

Master Scales are enclosed facilities in the United States and Canada uses exposed scales and limits acceptable environmental conditions.

The USDA and the railroads have gotten together on a regular basis - but these meetings typically have not included NIST, NCWM, or the States.

Overview of System in Canada (Nathalie Dupuis-Desormeaux, Renald Marceau, Jeff Watters)
Hierarchy of traceability in Canada drawing/overhead showed system from 1 kg at NRC to the Regional Offices of Measurements Canada and down to test car level with estimates of uncertainty at each level. OIML R 111 (test weights) and R 106 (railroad scales) applicable. Current tolerance 0.005 percent but specifications would allow up to 0.05 percent.

Certified test cars are required to inspect railroad scales in both Canada and the United States; some test cars are used in both countries. Mutual recognition of calibration results is desired. Determination of equivalency of results is needed. Request from CP Rail prompted request to NIST by Canada. Some States have recognized Canadian tests but Canada has not yet recognized test car calibrations done in the United States. One test previously compared tests between Chicago, Master Scale Depot, and Winnipeg with an agreement of 1.7 pounds.

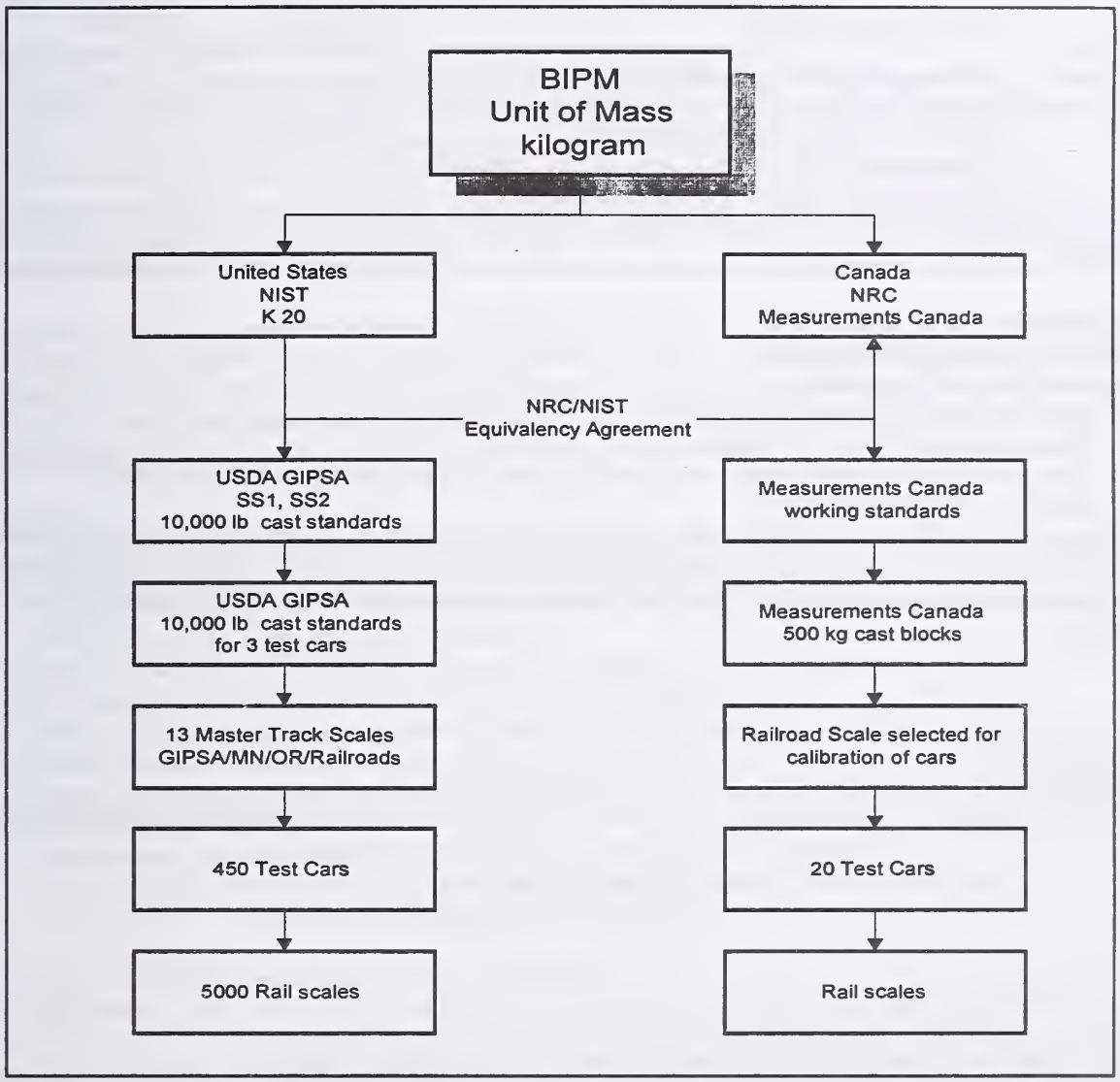


Figure 11 Draft Traceability Hierarchy.

Issues:

- duplication of calibration work (is a burden for test car owners)
- knowledge of who has authority for issuing calibration reports in the United States (in Canada, all reports are generated by Measurements Canada) [There is not one official certifying authority for the calibration of test cars in the United States.]
- evaluate intercomparison data between Canada and the United States for consistency and liability
- evaluate long-term stability of test car calibrations, stability, uncertainty, and procedural errors - data to determine uncertainties and errors have not been kept/evaluated
- traceability is legally required in both Canada and in each of the States

- mutual recognition is the goal

Overview of System in Mexico
(material from Henry Oppermann, U.S. Embassy, Mexico)
Canada and the United States would like to see Mexico involved in this process but do not want to hold up the comparisons and agreements. NORAMET and NACC involvement in the areas of national metrology and accreditation include Canada, United States, and Mexico. AAR - Louis Cerny completed a study of Mexican system but safety of overweight cars on bridges was the primary issue.

Overview of System Table

	United States	Canada	Mexico
Traceability	NIST ➜ USDA/GIPSA	NRC/MC	CENAM
Master Scales	13 (owned by USDA, MN, OR Railroads)	none	1
Test Cars	450 (tested by USDA, States, Railroads) USDA owns 3, MN, OR, WA own test cars; remainder owned by railroads	20 (tested by MC)	
Railroad Scales	5000		83 to 110

Test Car Calibration Procedures
Canada - Eric Klawis, Measurements Canada
Document in draft form - to be circulated
Using definitions from AAR. Tolerances on cars 0.005 percent to 0.01 percent.
Locations: Calgary - January; Winnipeg - MayJune
Standards: 500 kg blocks taken to scale after calibration and adjustment to zero error (using equal arm balance)
Procedure: Comparison with mass standards
Scale: Using an acceptable scale, do have preferences; 2 section beam scale; live rail, rigid platform; low usage; Ogden yards, 12 cars done all at once; environmental conditions have to be right - no wind, rain, snow; Scale evaluation: repeatability within 2/5 of the applicable tolerances to evaluate the scale and its ability to function as a null indicator (not to determine the uncertainties for the process)

$$\frac{(\max - \min)}{2} \times SR$$

Calculated Rest Point (CRP) is used rather than a sum of turning points (results have been equivalent in other applications).

$$CRP \left[\frac{\frac{(2nd_{ind} + 4th_{ind})}{2} + 3rd_{ind}}{2} \right]$$

Car condition: free from moisture, clean, good condition (mechanical and visible condition);
Control of cars by owners: CP, CN, CANAC; Repairs are reported to Measurements Canada but it is at a policy level (not regulated)
Two cars are required to place a railroad scale into service
CN and CP are signatories to the AAR Canadian Grain Commission requires annual test (prefers every six months).
Question: pt loading of weights vs car; simulation of a "car" and testing as used; e.g., flat car to stack weights on with the same wheel base would be ideal but not available
Using wood ties to stack weights and perform a zero test. Question was raised regarding stability of wood during test.
Canada requires two test cars to be at each railroad scale to place it in service.
Only Measurements Canada can issue calibration reports. They can/will reissue official reports for tests/data/reports prepared in the United States.

NIST SOP 27 - Bruce Adams, MN
Basically a direct reading using a calibrated Master Scale.
1 pound per 1,000 x 100,000 = 100 pounds (1/3 HB 44 requirements for a standard) vs 0.005 percent x 100,000 = 5 pounds
Why not Class F tolerances?
Weaknesses in program - 1 test being done; 2 tests would allow an "r" chart and evaluation of process repeatability.
Input to SOP 27 from industry? This procedure is not adopted as a regulation and there is no formal process to solicit input. If people have comments on the SOP 27, they should be submitted to Georgia Harris (this year).

AAR/USDA-GIPSA - Dick Pforr
GIPSA Procedures, Section 5 - essentially the same as SOP 27 except for tolerances (NIST to resolve differences in the SOP).
R 106 and R 111 to be evaluated against this section as well.
United States requires only one car to be present at a railroad scale when placing it in service.

Custody Transfer - Control of Standards
Only MN and OR have active Master Scales and programs. WA also has test car for checking rail scales. There has been an increase in requests from companies wanting traceability history for ISO 9000 purposes. Some railroads assign each car to 1 person, but not all have the staffing. Not all States are going to be interested in witnessing tests of cars and/or scales. The question of adequate oversight of the traceability and the level of uncertainties is being raised as we evaluate the entire system. A number of States have programs to place devices into official service and this is similar. When evaluating data for the test cars, the "as found" data that is significantly in error is usually the result of problems, suspected problems, or repairs which necessitate immediate recalibration.

Car recalibration practices vary on an organizational basis and no standards have been established. No AAR procedures or guidelines exist. (No annual requirement in handbook?) Whether maintenance procedures are established and documented for railroad test cars is unclear. Industry procedure for repair/replacement of parts is that the old and the new parts can be individually weighed and the car adjusted accordingly. The general feeling of weights and measures officials is that it would create an uncertainty that is too large and the car should be recalibrated. (Review AAR Handbook for details/evaluation).

Questions:
- What are States doing with respect to acceptance of calibration reports from other jurisdictions? (e.g., Oregon will accept a calibration report from a "certified lab" such as USDA/GIPSA or MN only - not a railroad.)
- How many States will, or want to, witness tests when the railroads are calibrating test cars and/or placing scales into service? (e.g., WY witnesses test car calibrations)
- Who will accept tests performed by the railroads when State staff are present to witness the test?
- Do States have staffing necessary to witness all tests and do they want to?
- What are the differences between regulatory oversight in the States regarding calibration of test cars and railroad scales?
- Should a training module be developed to ensure that the proper procedures are used for calibrating railroad test cars. Should some level of training and oversight be placed over the railroads in calibrating test cars used for testing and placing railroad scales into service?
- Are the States accepting calibrations of standards from other private companies?
- After evaluation of the data - is the information provided by Vic Gerber typical or exceptional?
- Who is "liable" for costs when errors are introduced into the system?

Tour of Master Scale Depot and Demonstration of Calibration
A tour of the Master Scale Depot was held on Friday, March 21, 1997. Dick Pforr, Paul Hadyka, and Fred Anderson (all USDA/GIPSA) provided the tour and answers to numerous questions. The CP Rail composite car that will be used in the comparison was tested and witnessed by those present.

Details of Round Robin Intercomparison

- CP Rail car at GIPSA - will go from GIPSA, MN, Winnipeg, MN and back to GIPSA; CP rail will coordinate transport and scheduling; composite car (30 mph)
- NIST/MC will perform the data analysis
- Each facility uses their own procedure; uncertainties to ISO Guide, k=2; 4 measurements, 1st one used as the result - and other 3 used to evaluate process variance
- Calibration reports to be submitted to: NIST, Georgia Harris
- Initial run to be completed by July
- continue on a 2-year cycle
- E_n used as evaluation criteria; mean is accepted value (disregard values in excess of 2 sd)

$$E_n = \frac{\left| x_{reported} - accepted\ value \right|}{\sqrt{Unc_{accepted}^2 - Unc_{reported}^2}}$$

Accepted value determination - to be determined based on data. Mean of 3 sites or investigation into differences. Process variability to be evaluated by standard deviation of 4 runs.
Additional sites suggested: Centralia, IL; Sedalia, MO; Oregon. An interest was expressed to get railroad data and additional State sites.

Follow Up Action Items

- Send Handbook 145 to Jeff Watters — GHarris (NIST)
- Send Z 540-1-1994 to Gerald Davis — Diane Lee (NIST)
- Modify SOP 27 tolerances — GHarris (NIST)
- Circulate Meeting Summary — GHarris (NIST)
- Send Updated Participant & Interested Party List (attends.wpd, interest.wpd) — GHarris (NIST)
- Send "Railroad Weighing in Mexico" by Henry Oppermann — GHarris (NIST)
- Circulate OIML R106 Procedure — GHarris (NIST)
- Send slides from Nathalie Dupuis-Desormeaux, Renald Marceau, Eric Klawis, and Jeff Watters, and draft calibration procedure for railroad test cars — Canada (MC)
- Contact Mexico through Henry Oppermann — GHarris (NIST)
- Document "Traceability" in the United States for July NCWM Meeting including identification of regulatory authority — Diane Lee/Paul Hadyka (NIST/GIPSA)
- Document "Traceability" in Canada for July NCWM Meeting — Nathalie Dupuis-Desormeaux (MC)
- Summary of Railroad and Contractor "controls" for handling and tracking of railroad test cars used as standards for July NCWM — Bob Feezor (AREA)
- Evaluate Test Car Data - as received and as left — GHarris/Nathalie Dupuis-Desormeaux (NIST/MC)
- Evaluate round robin data — GHarris/Nathalie Dupuis-Desormeaux (NIST/MC)
- CP Rail Coordinate round robin between U.S. and Canada — Brian Kotylak (CP Rail)
- Review Procedures and Calibration Reports against Z 540-1-1994 Guidelines (Collect Calibration Reports and Procedures) — Gerald Davis (AREA)
- Investigate potential use of St. Louis Refrigerator Car Company test car for an additional round robin to the same sites and extended sites in the United States (on an AAR Circular) — George Becht (SLRC)

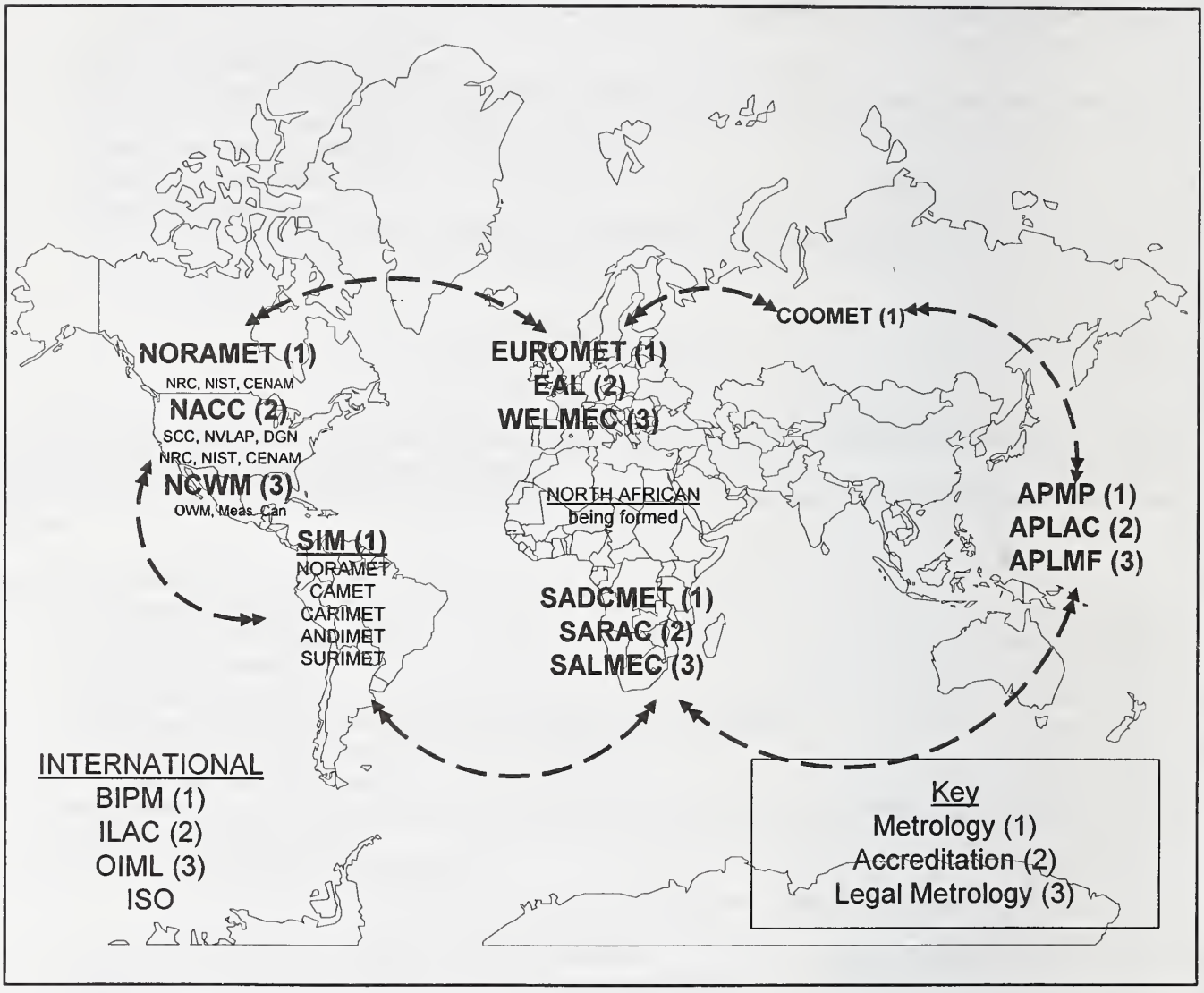
NCWM Annual Meeting - Railroad Forum Agenda
Swissotel, Chicago, IL
Monday, July 21 General Session 4:00 p.m. - 6:00 p.m.

Forum for Railroad Issues: International Traceability and Custody Transfer
Topics/Speakers

- Overview of the Railroad System of Measurement Traceability in the United States — Dick Pforr
- Summary of Railroad and Contractor "Controls" for Handling and Tracking of Railroad Test Cars Used as Standards — Bob Feezor
- Evaluation of Master Scale Data, Test Car Data, Round Robin Data — GHarris

Additional question raised at end of the meeting by Sid Colbrook (IL): What is the process/system for putting scales into commercial service throughout the United States? What controls are in place for scales in each of the States? This question was not addressed by the group during the meeting.

Appendix C - International Acronym Map



BIPM	International Bureau of Weights and Measures	SURAMET	South American Metrology Cooperation
ILAC	International Laboratory Accreditation Cooperation	EUROMET	European Metrology Cooperation
OIML	International Organization for Legal Metrology	EAL	European Cooperation for Accreditation of Laboratories
ISO	International Standards Organization		
NORAMET	North American Metrology Cooperation	WELMEC	Western European Legal Metrology Cooperation
NRC	National Research Council		
NIST	National Institute of Standards and Technology	COOMET	Cooperation for Metrology
CENAM	Centro National de Metrologia	APMP	Asia-Pacific Metrology Programme
NACC	North American Calibration Cooperation	APLAC	Asia-Pacific Laboratory Accreditation Cooperation
SCC	Standards Council of Canada		
NVLAP	National Voluntary Laboratory Accreditation Program	APLMF	Asia-Pacific Legal Metrology Forum
		SADCMET	South African Development Community Metrology Cooperation
DGN	Director General de Normas		
NCWM	National Conference on Weights and Measures	SARAC	South African Regional Accreditation Cooperation
OWM	Office of Weights and Measures (NIST)		
MEAS CAN	Measurements Canada	SALMEC	South African Legal Metrology Cooperation
SIM	Interamerican Metrology System		
CAMET	Central American Metrology Cooperation		
CARIMET	Caribbean Metrology Cooperation		
ANDIMET	Andean Metrology Cooperation		

Appendix D

January 8, 1997

MEMORANDUM FOR State Weights and Measures Directors

From: Dr. Peter L. M. Heydemann, Director
Technology Services

Subject: State Weights and Measures Laboratory Program

Because of the overlap with the NIST National Voluntary Laboratory Accreditation Program (NVLAP) which provides the only formal NIST laboratory accreditation, we recently made the decision that the Office of Weights and Measures will not provide accreditation to State Weights and Measures Laboratories but will rename its service. Although this decision may seem like services are being reduced, I want to reassure you that they are not. OWM will continue to provide oversight and support for the national measurement system in legal metrology and will recognize State Laboratories that comply with program requirements by issuing "Certificates of Traceability" to meet needs for accurate and traceable measurements. This decision was made for the following reasons:

- OWM does not comply with ISO Guide 58 as an accrediting body and thus may not officially grant accreditation to State Weights and Measures Laboratories; and
- NIST will provide only one program of accreditation and that is the National Voluntary Laboratory Accreditation Program, NVLAP.

Any State Weights and Measures Laboratory requiring accreditation may apply to NVLAP for accreditation and pay the usual accompanying fees. Initial tentative cost estimates from NVLAP are: first year $8,500, and subsequent years alternating between $2,600 and $5,300. These estimates are based on the current NVLAP fee schedule and full participation by States in the OWM Program. Fees include a two-person, two-day audit in alternating years. NIST will not subsidize the costs of NVLAP accreditation of State Weights and Measures Laboratories because:

- NVLAP is required by Federal law to recover fees from calibration laboratories for their services; and
- subsidizing the cost of accreditation is perceived as an "unfair market advantage" to State laboratories that compete with commercial firms providing comparable calibration services.

Please keep in mind that we will continue to support the Office of Weights and Measures and do not expect the State laboratory program to be diminished by these decisions. Handbook 143, Program Handbook will be revised to reflect an OWM Measurement Assurance Program (MAP) rather than accreditation. All other criteria in the program will remain the same (i.e., ISO/IEC Guide 25 will be used, technical criteria will remain the same, quality manual requirements will remain the same, etc.). OWM services will continue to include:

- a "Certificate of Traceability" and letters of conformance, as needed, to recognize a laboratory's capability of providing traceable measurements as needed for weights and measures enforcement action required by Statelaws. Note: NVLAP will not recognize the ability of State laboratories with these certificates to provide accredited traceable measurements unless they have NVLAP accreditation;
- technical assistance and support through training, publications, guidance, statistical analysis, and consultation; technical support through Regional Measurement Assurance Programs that include training and interlaboratory comparisons (which will be accepted as proficiency tests by NVLAP if the laboratory applies for accreditation); and
- laboratory assessments and evaluation to criteria published in Handbook 143, Program Handbook as needed to ensure oversight of the standards, facilities, equipment, and staff needed to provide accurate and traceable measurements for legal metrology.

OWM services will continue to be provided to industry and foreign governments as staff and resources are available. However, since it is beyond the scope of Federal weights and measures obligations to provide these services and measurement oversight for industry, fees will be charged for participation as is the case for all other NIST MAP services.

If you have additional questions or concerns, please feel free to contact me at 301-975-4500.

cc: Dr. Gilbert M. Ugiansky, Chief, OWM

Metrology Subcommittee Report

Georgia L. Harris, Manager State Laboratory Program, OWM
State Weights and Measures Laboratory Metrologists

Appendix E

Metrology's Top Questions & Answers About "Accreditation"

Based on recent changes in accreditation activities at NIST, a number of people have been asking questions about OWM's State Laboratory Program. The primary change is that OWM will no longer call its recognition of the State laboratories accreditation. The most frequently asked questions follow.

If OWM is not providing accreditation, what will OWM provide?

OWM will continue providing all services to the State labs except an accreditation certificate. We will now issue a Certificate of Traceability and a detailed letter of each laboratory's participation in the State Laboratory Program. All criteria in Handbook 143, Program Handbook, remain the same and nothing else in the program for the States is changed.

Will a "Certificate of Traceability" be adequate for the State labs?

Unless your laboratory clients require formal accreditation, the Certificate of Traceability and the accompanying letter detailing quality activities should be adequate. In cases where the Certificate is not adequate, laboratory clients should be requested to send a letter to NIST/OWM detailing their concerns.

Who determined HB 143 criteria?

The process of updating Handbook 143, State Weights and Measures Laboratory Program Handbook, was started in 1991. In accordance with recommendations of the NCWM ISO 9000 Task Force, OWM pursued adopting national and international criteria for quality in calibration laboratories. The process started with ISO Guide 25 and eventually ended with ANSI/NCSL Z 540-1-1994, which incorporates ISO Guide 25 and Mil-Std-45662A. The task force also developed the technical criteria for mass and volume for the draft NIST Handbook 150-2, NVLAP Technical Guide. The final draft copy of Handbook 143 was circulated for comment to all directors and metrologists twice, discussed at all regional metrology meetings in 1995, and was discussed at the NCWM Annual Meetings in 1994 and 1995.

Will State labs still submit annual material to OWM?

Yes. Even though OWM will not formally accredit laboratories, there is still an oversight responsibility needed to ensure uniformity and continued traceability of measurement standards used for weights and measures. If a laboratory gains accreditation, material should still be submitted as requested to receive recognition from OWM and to ensure uniformity.

What criteria will be used for assessing and/or accrediting the laboratory?

NIST Handbook 143, is being revised to change "accreditation" to "recognition" and "Certificate of Accreditation" to "Certificate of Traceability." It will be circulated prior to this year's NCWM Annual Meeting. All else in the Handbook remains the same for OWM applications. NVLAP will use the criteria in NIST Handbook 150 and 150-2, Technical Guide for accrediting laboratories. Criteria in Handbook 150 and draft Handbook 150-2 are the same as criteria in Handbook 143, although OWM is not authorized to act as an accrediting body.

Can States claim compliance to quality standards?

If a laboratory complies with a quality standard such as Z 540-1-1994, ISO Guide 25, or NIST handbooks, and has done internal auditing to verify compliance, the laboratory may make such claims. Laboratories have historically made claims of compliance to standards such as Mil-Std-45662A or NRC 10 CFR 50. Laboratories continue to claim traceability to NIST without formal accreditation. It is up to laboratory clients or a third-party auditor to verify the claims. Laboratories should avoid generic claims such as "complies to NVLAP" or "complies to OWM."

Will OWM continue providing training?

Yes. OWM Basic, Intermediate, and Advanced seminars as well as training at the Regional Measurement Assurance Program meetings will all continue. If you have suggestions for new metrology training, submit your ideas to Georgia Harris by e-mail: gharris@nist.gov or by fax: 301/926-0647.

Will OWM continue participation in the regional metrology groups?

Yes. As noted in Peter Heydemann's January 1997 memo, all functions of the State Laboratory Program will be continued. The only change has been the deletion of the term "accreditation" from any of OWM's activities. There are currently six regional groups and we have begun planning for training in 1998.

What training is being planned for the regional metrology meetings?

During 1997, training is being provided on the changes in the State Laboratory Program; to assist laboratories in complying with Handbook 143 training is being provided on: administrative procedures, calibration reports, Handbook 143 and the Z540-1-1994 Interpretive Handbook; and training will be conducted on round robin data. We are also holding a Train-the-Trainer seminar for PMAP in June. In 1998, PMAP training will be provided at all of the regional metrology meetings. Send additional ideas and suggestions for metrology training at the RMAPs to Georgia Harris or your current RMAP chair.

Who pays for NIST calibration of primary standards?

Whoever sends standards to NIST pays for calibration. NIST publishes SP 250, Calibration Services Guide and its corresponding fee schedule with calibration fees. OWM pays for calibration of artifacts used in the interlaboratory comparisons in the RMAPs.

Will OWM conduct regular on-site assessments?

Based on the changes in program focus, OWM will continue on-site assessments on an as-needed basis and as travel plans allow. If a State submits a special request for an assessment, or has a new or renovated laboratory, or if OWM receives complaints, an on-site assessment will be scheduled. The purpose will be to verify compliance to Handbook 143 criteria - to ensure that accurate and traceable measurements are provided by the laboratory and will not be considered a pre-assessment for accreditation purposes.

Who can provide formal accreditation?

Currently NIST's National Voluntary Laboratory Accreditation Program (NVLAP) and the American Association for Laboratory Accreditation (A2LA) are recognized by the calibration community as being able to provide these services.

What will accreditation cost?

Estimates from NVLAP and A2LA for the first 5 years are about $25,000 and $17,000 respectively. Actual fees per year vary between $2,600 and $8,500 for NVLAP and between $1,100 and $4,900 for A2LA, but these are the estimated totals and will vary depending on the actual number of measurement parameters and general level of participation in OWM's measurement assurance program activities (training, regional meetings, round robins).

How often will on-site assessments be conducted for accredited laboratories?

On-site assessments will be determined by the accrediting bodies (NVLAP or A2LA). It is a requirement for accrediting bodies to assess the laboratories at least every 2 years, and they have the option for interim monitoring assessments. OWM will conduct on-site assessments as requested and as time, travel, and resources permit.

What is ISO Guide 58 and why doesn't OWM meet it?

ISO Guide 58 is the quality standard with which accrediting bodies must comply. The primary obstacle that OWM faces in trying to meet the criteria in this Guide is that its training/consulting functions are not independent of its assessment/recognition functions. Specifically, the same staff who teach quality procedures to State metrologists are also evaluating how well they are implementing the procedures. Consequently, OWM would either have to give up its training functions in order to meet the Guide 58 or would have to hire more staff in order to separate the training function from the assessment function. Since NIST management has decided that there will only be one accreditation program for laboratories operated by NIST, neither of these options will be considered.

Does accreditation provide product certification?

No. As the old saying goes, a company could be registered to ISO 9001 and still be making cement life jackets (although with a good auditor and good registrar that would not happen). Accreditation criteria specifically indicate that accreditation does not cover product quality - it only evaluates the capability of a laboratory to make measurements. Why is this important for weights

and measures? Regulatory agencies are given the responsibility and authority to ensure that appropriate standards, that meet specifications with valid calibration data, are used for inspection and enforcement activities. Accreditation only verifies that the laboratory has the ability to make adequate measurements and does not evaluate whether products meet specifications.

Report of the Resolutions Committee

David A. Wallace, Chairman
Director, Measurement Standards
State of Colorado

Reference
Key No.

700

GENERAL

The Resolutions Committee wishes to express the appreciation of the members of the National Conference on Weights and Measures to those who contributed their time and talents toward the arrangements for the conduct and success of this 82nd Annual Meeting. Special votes of thanks are extended:

(1) to Caroline Schoenberger, Commissioner, Department of Consumer Service, City of Chicago, Illinois, for her welcoming remarks during which she outlined the administrative law systems of the City of Chicago; to Commissioner Schoenberger and her staff for all assistance and courtesies extended prior to and during this 82nd Annual Meeting;

(2) to the Illinois Department of Agriculture Weights and Measures, particularly Sid Colbrook, Director of Weights and Measures and his staff for the hospitality extended to the Conference and assistance in preparation for and conduct of this Annual Meeting;

(3) to Sergeants-at-Arms, Dan Dowling and Paul King, Chicago Department of Consumer Service, for their assistance during Conference sessions;

(4) to Alan Johnston, President of Measurement Canada, for his address concerning the major changes underway in Canada relative to weights and measures;

(5) to Dr. Robert M. Hebner, Acting Director of the National Institute of Standards and Technology (NIST), for his remarks to the membership indicating continuation of the NIST partnership with NCWM; to Dr. Hebner for outlining the NIST approach to reducing the barriers to global trade; to Dr. Hebner for his comments on the Food and Drug Administration (FDA) proposed rule, the milk study conducted by the Federal Trade Commission (FTC), NIST/OWM, U.S. Department of Agriculture (USDA), and the FDA, and his remarks regarding ways in which national studies and establishment and maintenance of a national database could potentially help in the ongoing pursuit of equity;

(6) to Barbara J. Bloch, Chairman, and the officers and appointed officials of the National Conference on Weights and Measures for their assistance and service toward progress on national issues;

(7) to committee members for their efforts throughout the past year preparing and presenting their reports; to the subcommittees and work groups for their discerning and appropriate recommendations;

(8) to regulatory officials of State and local jurisdictions for the advice, interest, and support of weights and measures administration in the United States;

(9) to representatives of business and industry for their cooperation and assistance in committee and Conference work, most especially the continuing support as demonstrated by the granting of scholarships for training; to the associate membership organization for the hospitality exhibited in sponsored social functions; particularly to Paul Zalon, Nestle Company, for his efforts in arranging the outstanding excursion to Sportsman's Park for the enjoyment of Conference members and their guests;

(10) to the staff of the Swissôtel for their assistance and courtesies, all of which contributed to the enjoyment and comfort of the delegates within their outstanding facilities; and

(11) to the National Institute of Standards and Technology and its Office of Weights and Measures for their dedicated assistance in planning and conducting the work and program of the National Conference on Weights and Measures, especially to Ann Turner, Phillip Bryson, and Michele Krebs for their professional and hospitable conduct of the administrative operations of the meeting; to Dr. Gil Ugiansky for his participation and for his continued support, most especially for his efforts in ensuring continuation of the effective instructor training and equipment loan programs;

On this occasion of the 82nd Annual Meeting of the National Conference on Weights and Measures, the committee wishes to recognize and express its appreciation to the following individuals:

- to Mayor Richard M. Daley for his proclamation welcoming the NCWM to the City of Chicago and declaring the period of July 20-24, 1997, Chicago Weights and Measures Days;

- to Ken Butcher, NIST Office of Weights an Measures, for his diligence and dedication in working with the Food and Drug Administration (FDA) to obtain cooperation on their proposed rule to adopt NIST Handbook 133, "Checking the Net Contents of Packaged Goods."

D. Wallace, Colorado, Chairman
M. Hile, AR
V. Massey, Shelby Co., TN
J. Silvestro, Gloucester, NJ

J. Mindte, NIST, Coordinator

Resolutions Committee

Report of the Nominating Committee

Charles A. Gardner, Chairman
Director of Weights and Measures
Suffolk County, New York

Reference
Key No.

800

The Nominating Committee met during the Interim Meeting at the DoubleTree Hotel, Rockville, Maryland, at which time the Committee nominated the persons listed below to be officers of the 83rd National Conference on Weights and Measures. In the selection of nominees from active membership, consideration was given to professional experience, qualifications of individuals, Conference attendance and participation, and other factors considered to be important.

Two members of the committee were unable to be present during the meeting: members N. David Smith and James C. Truex were consulted by way of telephone in reaching consensus. The following slate of officers was selected by the Nominating Committee and was adopted by unanimous vote of the Conference:

CHAIRMAN-ELECT:	Aves D. Thompson, Alaska
VICE-CHAIRMEN:	Mark Buccelli, Minnesota*
	Mark P. Coyne, Brockton, Massachusetts
	G. Wes Diggs, Virginia
	David R. Wallace, Colorado
EXECUTIVE COMMITTEE:	Stanley K. Millay, Maine
	Louis E. Straub, Maryland
TREASURER:	J. Alan Rogers, Virginia

* During the 82nd Annual Meeting, the Committee named Mark Buccelli to replace Michael Blacik.

C. Gardner, Suffolk County, New York, Chairman

S. Colbrook, Illinois
T. Geiler, Barnstable, Massachusetts
D. Guensler, California
A. Nelson, Connecticut
N. David Smith, North Carolina
J. Truex, Ohio

Nominating Committee

Report of the Auditing Committee

Monty H. Hopper, Chairman
Director of Weights and Measures
Kern County, California

Reference
Key No.

900

The Auditing Committee met on Monday, January 13, 1997, during the NCWM Interim Meeting in Rockville, Maryland. The purpose of the meeting was to review the financial reports of the Conference Treasurer.

The following person was also in attendance:

J. Alan Rogers, Treasurer

The Auditing Committee finds the financial reports of the Conference Treasurer to be in order and correct, according to Conference procedure.

M. Hopper, Chairman, Kern County, California

R. Philmon, Illinois
R. Williams, Tennessee

A. Turner, NIST, Technical Coordinator

Auditing Committee

TREASURER'S REPORT
NCWM GENERAL ACCOUNT
FISCAL YEAR REPORT
1/1/96 - 12/31/96

Category Description			
INCOME/EXPENSE			
INCOME			
Income Accounts:			
Earned Interest	2,716.57		
		2,716.57	
Membership Fees:			
Associate Membership Fees	57,555.00		
Government Membership Fees	58,100.00		
Total Membership Fees		115,655.00	
NTEP Seminars:			
Metrology Seminars	31,069.47[1]		
Total NTEP Seminars:		31,069.47	
Other Income:			
Miscellaneous	335.85		
Other Income - Other	103.02		
Total Other Income		438.87	
Promotions	2,340.00		
		2,340.00	
Publications:			
HB-133 Third Edition Sales	1,710.00		
NCWM Publications Sales	2,542.25		
NTP Training Module Sales	525.00		
Videos Sales	21.95		
Total Publications		4,799.20	
Registration Fees:			
Annual Meeting	40,215.00		
Interim Meeting	15,775.00		
Total Registration Fees		55,990.00	
Services Revenues:			
Annual Mtg. Opt. Evening	888.00[2]		
Total Services Revenues		888.00	
Total Income Accounts			213,897.11
TOTAL INCOME			213,897.11

Treasurer's Report

EXPENSES		
Expense Accounts:		
Administration:		
Bank Charges	82.12	
Contracts/Personnel	14,526.70	
Equipment/Supplies/Stationary	5,326.42	
Mailing/PO Box	268.00	
Miscellaneous	200.00	
NTP/CEU/Copyright/Equipment	848.00	
Treasurer Bond	441.00	
Total Administration		21,692.74
Chairman/Chairman Elect	17,433.99	
		17,433.99
NCWM Annual Meeting Expenses.:		
Awards	2,584.47	
Hotel/Food Service	38,101.45	
Joint Outing	7,601.71[3]	
Personnel/Photo	676.84	
Printing/Copying	2,334.83	
Miscellaneous	8,826.83[4]	
Total NCWM Annual Meeting		60,126.13
NCWM Interim Meeting Expenses:		
Hotel/Food Service	23,947.96	
Print Agenda	3,535.00	
S & T Committee	2,791.55	
L & R Committee	2,020.21	
A & P Committee	2,041.85	
Other Committees/TF's	2,717.38	
Printing/Personnel/Equipment/Misc.	184.00	
Executive Committee	4,170.03	
Total NCWM Interim Meeting		41,407.98
NTP Seminars:		
Metrology Seminars	33,847.36[1]	
Total NTP Seminars		33,847.36
Other Meetings-Committees	22,731.59	
Total Other Meetings-Committees		22,731.59
Printing:		
Membership	2,528.00	
NCWM Pubs for Members	7,688.30	
Total Printing		10,216.30
Publication Reimbursement	5,305.00	
Special Events	2,200.00	
Task Force & Special Meetings	12,748.44	
Training	8,703.33	
		28,956.77

TOTAL INCOME/EXPENSES	(22,515.75)
Carryover 12/31/95	148,544.19
Year Ending Balance 12/31/96	126,028.44
Account Balance 12/31/96	126,028.44
Difference	- 0 -
Year Ending Adjusted Balance	126,028.44

1. Balances include money collected from industry participants in NCWM/NIST metrology training seminars that was set aside for additional metrology training activities.

Fiscal Year	Income	Expenses	Balance
1993	-0-	-0-	-0-
1994	3,800.00	3,371.30	428.70
1995	25,260.00	9,686.92	15,573.08
1996	31,069.47	33,847.36	(2,777.89)
Totals	60,129.47	46,905.58	13,223.89

2. Fees collected at the Annual Meeting for the joint Conference outing were distributed to the Associate Account on a 60 percent basis and to the NCWM Account on a 40 percent basis.
3. Conference provided 40 percent of the total cost of the joint outing.
4. This expense includes $7,923.83 for souvenir items given at the Annual Meeting.

NCWM NTEP ACCOUNT
FISCAL YEAR REPORT
1/1/96 - 12/31/96

Category Description			
INCOME/EXPENSE			
INCOME			
Income Accounts:			
Grant-Grain Equipment		4,232.00	
Earned Interest		5,085.32	
NTEP Operations			
CoC Maintenance Fees	131,980.00[1]		
Publications 5 & 14 Sales	8,937.75		
Sales of NTEP Sales	2,575.00		
Total NTEP Operations		152,810.07	
Total Income Accounts			152,810.07
TOTAL INCOME			152,810.07

EXPENSES			
Expense Accounts:			
Personal Services	18,660.88		
Miscellaneous	200.00		
Bank Charges	15.65		
Total Administration		18,876.53	
Grain Moisture Task Force	7,967.34		
Total Grant		7,967.34	
NTEP Operations:			
Board of Governors	2,634.00		
NTEP Publication 5 and 14	14,548.00		
NTETC Belt Conveyor Scale	8,356.09		
NTETC Measuring Sector	4,704.91		
Software Work Group	3,032.41		
Automatic Weighing System	5,595.76		
US/Canada Work Group	7,285.33		
Total NTEP Operations		46,156.50	
NTEP Logo:			
NTEP Seals	555.32		
Total NTEP Logo		555.32	
Total Expense Accounts			73,555.69
TOTAL EXPENSES			73,555.69
TOTAL INCOME/EXPENSE		79,254.38	
Carryover 12/31/95		270,307.16	
Year Ending Balance 12/31/96		349,561.54	
Account Balance 12/31/96		349,561.54	
Difference		-0-	
Year Ending Adjusted Balance		349,561.54	

1. Total of $20.00 in bank charges deducted from maintenance fees paid by foreign companies.

NCWM GRANT ACCOUNT
FISCAL YEAR REPORT
1/1/96 - 12/31/96

Category Description			
INCOME/EXPENSE			
INCOME			
Income Accounts:			
Grants Received		8,461.72	
Total Income Accounts			8,461.72
TOTAL INCOME			8,461.72
EXPENSES			
Expense Accounts:			
Interest Transfer	103.02		
Grands Awarded	8,470.00		
Total Expense Accounts			8,573.02
TOTAL EXPENSES			8,573.02
TOTAL INCOME/EXPENSE			(111.30)
Carryover 12/31/95			3,111.30
Year Ending Balance 12/31/96			3,000.00
Account Balance 12/31/96			3,000.00
Difference			-0-
Year Ending Adjusted Balance			3,000.00

New Chairman's Address

Steven A. Malone
Administrator, Weights and Measures Division
Nebraska Department of Agriculture
Lincoln, Nebraska

Thank you Barbara. I appreciate your kind remarks. Will you please remain at the podium?

I would like to take this opportunity to let the Conference know, from my first-hand experience, how much work Barbara Bloch has put forth for this organization.

You've heard the old saying, "Leave the wood pile higher than you found it"? Well, Barbara has certainly accomplished that, and her mark will be recognized for many years to come. Her most notable achievements will be her efforts in developing the conference's Strategic Plan. The Plan's concepts have already started to take shape and will continue to develop for many years to come. We now have documented Conference direction and vision.

Barbara would be the first to tell you she did not conceive these concepts on her own, but I will tell you, she has been the force that has kept this process going. Without her efforts this important function may have failed.

In the year ahead, I look forward to continuing to work with Barbara on the Strategic Plan and to assist her in her role as Chairman of the NTEP Board of Governors.

Barbara, on behalf of the membership of the National Conference on Weights and Measures, it is my great pleasure to present you with this plaque in recognition of your service to the Conference. Thank you!

Would Aves Thompson and Bob Fuehne please join us at the podium?

Aves Thompson is our new Chairman-Elect. He is the Chief of the Alaska Division of Measurement Standards. Bob Fuehne is the new Chairman of the Associate Membership Committee. Bob is QA Manager of Pet Foods for Ralston Purina Company in St. Louis, Missouri. Both are very active members of the Conference and it is my pleasure to serve with both of them. The four of us serve the Conference on your behalf. We take on our responsibilities in partnership with the staff of the office of Weights and Measures. I would like for Dr. Gil Ugainsky and his staff to rise and be recognized for their efforts on behalf of the Conference and the weights and measures community as a whole.

It is with pride, I begin my responsibilities as Chairman of the National Conference on Weights and Measures. The activities of the weights and measures community have a tremendous impact, daily, on each and every individual in this country. What is amazing to me, is how so few people realize what weights and measures does in providing equity for the millions of transactions which take place each day. Most people have this uncanny level of trust, in each of their daily purchases, not realizing Weights and Measures plays a part in each one. This level of trust is the mark left by our Weights and Measures predecessors. It is our responsibility to ensure that this trust remains intact.

To ensure this trust, we, as individuals and organizations, must WORK TOGETHER to meet the challenges which will come before us in the future. Today, more than ever, we need to bring back the "WE" concept. The theory of "I" doesn't get the job done. There is only one way to accomplish most tasks and that is when PEOPLE WORK TOGETHER.

I believe that when PEOPLE WORK TOGETHER they can accomplish anything. Based on this belief, I have chosen "WORKING TOGETHER FOR EQUITY" as my Conference theme.

In keeping with this theme, and to preserve the public trust, we must develop and improve our relationships with the National Institute of Standards and Technology, the Department of Commerce, and various segments of Congress. By developing and improving these relationships, we will demonstrate the importance of the work done by this Conference and the weights and measures community.

To initiate this effort, I am appointing a Special Committee for Legislative Liaison. This committee's primary responsibility will be to build upon and renew our relationships with Congress, the Department of Commerce and the National Institute of Standards and Technology. In the past, the Conference has visited various Congressional Representatives with success. These meetings have not been regularly scheduled however, thus we have not been able to build upon these relationships. The objective of the Committee will be to achieve continuity in our liaison activities.

I have asked Tom Geiler, of Barnstable, Massachusetts to serve as Chairman with N. David Smith, of North Carolina and William Corey, of American Frozen Foods to serve as committee members. This is a small, but effective, committee with the ability to call upon other members to assist.

The committee will report to the Chairman, Executive Committee, and the Conference membership regarding their progress in meeting the following charges:

1. Develop an action plan for review by the Executive Committee.

2. Develop and improve relationships with National Institute of Standards and Technology, the Department of Commerce and other Federal Agencies to provide a better understanding of the National Conference on Weights and Measures and the activities of state and local Weights and Measures Programs.

3. Develop relationships with select Committees of Congress, individual Congressional Representatives, and their staff.

4. Assess the value of designating this Special Committee as a standing committee of the Conference.

To assist in support of the Committee, I am requesting the Office of Weights and Measures to:

1. Design a graphic presentation to illustrate the economic impact basic measurement has upon our country's economy.

2. Provide several examples which will demonstrate how basic measurement impacts advanced technology.

The Conference must take the lead in this area, if we are to remain a viable organization in the future. With Tom's, and the other committee members' strong interest and leadership, the Conference will see the benefits from these liaison activities.

One of the important responsibilities of the Conference Chairman is to appoint members to serve on the Annual and standing committees. The dedication of the committee members and the many other volunteers, is what makes this organization so successful.

In my office I have a sign that reads:

There are three kinds of People

Those Who MAKE things Happen,

Those who WATCH things happen,

and Those Who WONDER What Happened.

The individuals I am about to appoint are among those who "Make Things Happen."

I have selected members to serve who will compliment the committees, understand the commitments required of time and effort, and demonstrate their enthusiasm for weights and measures. Members of the various committees are the future of this Conference. Therefore, I am proud to announce the following appointments:

Specification and Tolerance Committee: Mark Coyne, Brockton, Massachusetts (5)

Laws and Regulations Committee:
Ross Andersen, New York (5)

Administration & Public Affairs:
Chris Quasebarth, West Virginia(5)

Nominating Committee:
Tom Geiler, Barnstable, Massachusetts
Charles Gardner, Suffolk Co, New York
N. David Smith, North Carolina
Alan Rogers, Virginia
Sidney Colbrook, Illinois
Jim Truex, Ohio

Auditing Committee:
Don Onwiler, Nebraska (3)

Credentials Committee:
Jack Kane, Montana (2)
Herman Hochstetler, Elkhart County, Indiana (3)

Resolution Committee:
Lewis Jones, Ohio (1)

Parliamentarian:
Ken Simila,Oregon (1)

Chaplain:
Mike Hile, Arkansas (1)

Assistant Treasurer:
Fred Clem, Columbus, Ohio (1)

Sergeants-at-Arms:
Clark Cooney, Oregon (1)
Russ Wyckoff, Oregon (1)

Associate Membership Committee:
Chairman: Bob Fuehne

Executive Committee Replacements:
Barbara Desalvo, Ohio (2)
Charles Carroll, Massachusetts (1)

Each one of these appointees and the other committee members will give their utmost to the Conference. The committees and the leadership of the Conference, place high expectations upon themselves to do their best. We are, however, merely your representatives. We need your commitment, your participation and your help to be successful.

The year ahead will require more from each of us. A few of the many challenges we will face include:

1. The Executive Committee will continue to develop the Conference's Strategic Plan. One of the components currently being worked on is the NCWM business plan. Work on our business plan has already led to changes in the Conference. We are incorporating, and this is a major step in taking the Conference to the next level. More changes in how the Conference operates will be forthcoming.

2. The Strategic Plan also speaks to the development of a business plan for the National Type Evaluation Program. One segment of the NTEP Business Plan will include a method to verify that production devices are meeting the same standards applied to the NTEP evaluated device. Serious concerns have been raised from both regulators and manufacturers, regarding the ability of production devices to meet Type. I will be placing a great deal of emphasis on this issue. The weighing and measuring sectors will be asked to assist the NTEP Business Plan working group to develop specific procedures to reduce the likelihood a manufacturer will produce a golden device. The procedures

also must deal with complaints to ensure valid complaints are heard and frivolous complaints are discouraged. We must establish these mechanisms if National Type Evaluation Program is to remain effective. Our failure to address these issues will erode confidence in this Program.

3. The Conference and the Office of Weights and Measures need a comprehensive training plan that includes the basic elements of instructor training, printed instruction materials, training standards, and evaluation procedures. The Administration and Public Affairs Committee will assist in the development of the training delivery plan outlined in our Strategic Plan. This effort will encompass the work of the Program Evaluation Working Group as well. This group is currently at a stand still. However, I am asking the group to renew their efforts and focus on helping jurisdictions, by developing criteria which can be used for self evaluation. This means developing procedures for internal surveying and for determining compliance levels. These levels will be used as bench marks for program performance and for future evaluations.

4. The Conference must strike a balance between the need for international involvement while meeting our domestic needs. The limitations on Conference resources weigh heavily on our ability to participate in all areas. There is a need, however, to participate in the international arena. We need to set our priorities, keeping in mind that we are part of the global market. This balance must also incorporate the needs of the various industries of the Conference.

5. The Conference and the Metrology Subcommittee will continue their efforts to illustrate the state laboratories are in a partnership with the National Institute of Standards and Technology in bringing about standard's assurance. Without the state laboratories, basic measurement can not be maintained.

These and many other issues will come before the Conference in the next year. It is up to us to deal with each issue.

In closing, I would propose we keep in mind and follow these concepts:

DO A FEW THINGS WELL.

MASTER THE BASICS.

GET THE RIGHT PERSON FOR THE JOB.

BE TENACIOUS, WHILE UNDERSTANDING THE NEED FOR CHANGE.

BE A GOOD LISTENER.

BE FIRM, BUT FAIR, WHILE ENFORCING THE REQUIREMENTS WE PASS.

LEAD WITH YOUR PHILOSOPHIES.

DO NOT WORRY ABOUT WHO GETS THE CREDIT.

BE WILLING TO ROLL UP YOUR SLEEVES AND GET DIRTY.

GET OUT OF YOUR OFFICE AND VISIT THE REAL WORLD.

KNOW THEIR BUSINESS (THE PEOPLE WE REGULATE AND WHO WE SERVE).

IT'S OK TO MAKE MISTAKES. ADMIT THEM, MAKE CHANGES, AND MOVE FORWARD.

THINGS DON'T HAVE TO BE PERFECT TO BEGIN. JUST START AND IMPROVE.

We can accomplish anything we set out to do if we WORK TOGETHER.

Finally let me take this opportunity to thank a few people who, without their support, I could not take on this responsibility. To Joyce Luther and Cheryl Collier, my administrative staff, and to each member of my inspection staff for their support and efforts.

A special thank you to Dick Suiter for his help and assistance over the many years. There are many others to thank, but none more important than my wife Marcia. Thank you, honey.

Thank all of you for this opportunity to serve the National Conference on Weights and Measures. I will do my best.

NCWM 82nd Annual Meeting
Chicago, Illinois
July 20-24, 1997

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