



NBS SPECIAL PUBLICATION **663**

U.S. DEPARTMENT OF COMMERCE / National Bureau of Standards

Report of the 68th National Conference on Weights and Measures 1983



NATIONAL BUREAU OF STANDARDS

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Report of the

68th National Conference on Weights and Measures 1983

*Sponsored by the National Bureau of Standards
Attended by Officials from the Various
States, Counties, and Cities, and
Representatives from U.S. Government,
Industry, and Consumer Organizations
Sacramento, Calif., July 17-22, 1983*

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Louis E. Barbrow
Ann P. Heffernan



*United States Department of Commerce
Malcolm Baldrige, Secretary*

*National Bureau of Standards
Ernest Ambler, Director*

THE WHITE HOUSE

WASHINGTON

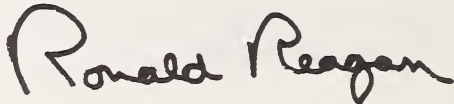
March 11, 1983

I send my greetings and congratulations to the delegates at the annual meeting of the National Conference of Weights and Measures.

The National Conference plays a vital role in our marketplace, protecting the rights of consumers and insuring the legitimate profit and reputation of every business dependent upon a system of weights and measures.

The education of consumers about the importance of the weights and measures system is another function ably performed by the National Conference.

I applaud your efforts in bringing the public and private sectors together in this significant work, and I wish you every success in your endeavors.

A handwritten signature in dark ink, reading "Ronald Reagan". The signature is written in a cursive, flowing style with a large initial "R".

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ABSTRACT

The 68th Annual Meeting of the National Conference on Weights and Measures met at the Red Lion Inn in Sacramento, California during the week of July 17, 1983. Attendance totaled 424 (333 paid registrants and 91 guests) from forty-seven (47) States and Puerto Rico. The theme of the meeting was "Progress in Professionalism."

Major actions were taken on organizational and procedural changes to the Conference, labeling of gasoline containing alcohol, national type evaluation, and development of training materials.

Special meetings included those of the Task Force on Package Control, the Advisory Committee on Grain Moisture Measurement, Metrologists' Workshop, the Associate Membership Committee, the Scale Manufacturers Association, the Industry Committee on Packaging and Labeling, the Weights and Measures Division of the National Association of State Departments of Agriculture, the State regional weights and measures associations, and OIML Pilot Secretariat 20 (Prepackaged Products).

Reports by the several standing and annual committees of the Conference comprise the major portion of the publication. Also included are the addresses and technical papers delivered at the General Session by Conference officials and other authorities from Government and industry.

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

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Note: Opinions expressed in Non-NBS papers are those of the authors and not necessarily those of the National Bureau of Standards. Non-NBS Speakers are solely responsible for the content and quality of their material.

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OFFICERS OF THE CONFERENCE
(July 16, 1982 - July 21, 1983)

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July 16, 1982 - July 21, 1983

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Neal Peterson, General Mills
Austin Rhoads, Milk & Ice Cream Association

Registration

Dawn Alger
Karen Barkley

Nancy Chapwick

Ann Heffernan
Carol Ramsey

STATE LABORATORY METROLOGIST WORKSHOPS

Monday, July 15, 1983
and
Wednesday, July 17, 1983

The topics discussed at the workshops ranged from international metrological requirements and NBS calibration procedures to measurement results among the States and the latest developments in load cell mass comparators. Mr. Dieter Buer, Director of Weights and Measures for the City/State of Bremen, Federal Republic of Germany, discussed the statistics and principles of mass calibration applied in the Federal Republic of Germany and their relationship to the OIML weight class tolerances.

Jerry Keller, NBS, reported on the operation of the NBS mass calibration laboratory and explained the extensive information contained in the NBS Report of Calibration for mass standards. Randy Schoonover, NBS, reported on the results of an experiment to explore the calibration capability of State laboratories and investigate the influence of factors that limit the ability of State metrologists to perform mass calibrations. Representatives of the various State regional metrology groups reported on their activities and the results of round robin experiments to investigate and promote uniform measurement results among the States.

The second workshop session began with a tour of the California Division of Measurement Standards (DMS) office/laboratory building. The staff briefed the metrologists on the programs of the Division emphasizing the metrology programs.

Tom Scrivener of Frazier Precision Instrument Company gave a presentation and demonstration of the Frazier-Schoonover load cell mass comparator. The operation, considerations, and the many innovations of the comparator were described. Steve McGuire, Illinois metrologist, reported on his experiences using the first production model of the comparator. Joe Rothleder, California metrologist, then discussed the operation of an experimental version of the 50-lb load cell mass comparator. He also reviewed the results of test that were run on the comparator.

GENERAL COMMITTEE MEETINGS

Monday, July 18, 1983
and
Tuesday, July 19, 1983

Monday and Tuesday were set aside for general meetings of the five Conference Standing Committees. Notices of these general meetings were carried in the Conference Announcement booklet, in all pre-Conference publicity, and in the printed Conference program. Many delegates participated in the committee general meetings and presentations were given by representatives of weights and measures, industry, government, and consumer groups. The discussions that took place played an important role in guiding the committees in their deliberations and in the preparations of their final reports. The final reports of the committees in this publication reflect the discussions that took place and the actions taken by the Conference at the time the final reports were presented to the delegates.

GENERAL SESSION

Tuesday Afternoon --- July 19, 1983

Call to Order

CHARLES H. GREENE
Conference Chairman, Presiding

Presentation of Colors and National Anthem

Invocation and Pledge of Allegiance
REV. FRANCIS W. DANIELS
Conference Chaplain, Weights and Measures
Administrator, Wayne County, IN

Welcoming Address
CLARE BERRYHILL
Director, Department of Food and Agriculture, State of California

Progress in Professionalism
CHARLES H. GREENE
Conference Chairman

ERNEST AMBLER
Conference President
Director, National Bureau of Standards

Honor Awards Presentation

Overview of the U.S. Standards System -- ANSI's Role in National and
International Standardization
DONALD L. PEYTON
President, American National Standards Institute

Latest Developments in the Weights and Measures and Trading Standards
Service in the United Kingdom
PAUL ALLEN
Chairman, Trading Standards Department, East Sussex County Council,
England

Annual Report, Office of Weights and Measures
ALBERT D. THOLEN
Chief, Office of Weights and Measures, National Bureau of Standards

A Surface Dependent Thermal Effect in Mass Calibration
RANDALL SCHOONOVER
Physical Science Technician, National Bureau of Standards

Meter Testing With a Compact Prover
JAMES W. WILLIAMS
Brooks Instrument Division, Emerson Electric Company

PROGRESS IN PROFESSIONALISM

Presented by Dr. Charles H. Greene
Director, General Services Division
New Mexico Department of Agriculture

The theme for the 68th National Conference on Weights and Measures was "At the Crossroads." In some respects we are always at the crossroads in that we face decisions continuously, the outcome of which have the potential to change the direction our organization will take. The results of our decisions are often not immediately apparent.

In my case I can say that the decision to accept your invitation to serve as the Chairman of the 68th National Conference on Weights and Measures resulted in one of the best years of my life and certainly one of the most interesting ones. The opportunity to attend each of the regional conferences and to meet and visit with many weights and measures officials and industry representatives who do not get to attend the National Conference was an experience I will treasure. The experience enriched me, and will be long remembered.

In terms of another crossroad, there have been those of us who felt for some time that the National Bureau of Standards had strayed from the path in its support of the Office of Weights and Measures and of the Conference. We felt alienated and insecure in our future relationships with the parent organization. As you will recall, we were reassured by our President, Dr. Ambler, through his remarks at Atlanta. Subsequent events have shown concretely that the commitment of NBS to weights and measures and to the Conference is unswerving and definitely on the right track.

Let me take a moment to enumerate some recent events that demonstrate how we successfully negotiated that crossroad, and began once again to make progress toward more professionalism in weights and measures. The additional resources being applied to training, to national type evaluation, and to laboratory accreditation are important examples that make my point.

It has always been true that a weights and measures program can be no stronger than the standards that support it and the metrology laboratories that keep the traceability intact. Our friends and supporters - indeed, some of our colleagues - seem not to be aware of the extreme importance of having well equipped laboratories staffed by competent, well trained metrologists. The field staff are limited in their professionalism abilities by the validity of the physical standards by which commercial performance is evaluated. The new initiative in metrology laboratory accreditation will do much to enhance our professional capabilities at the State and local levels.

Device evaluation or prototype examination had pretty much gotten out of hand. Inadequate resources at the Bureau, as well as proliferating and non-uniform State regulations, have placed an unreasonable burden on those whom the device evaluation program ought to benefit most - the manufacturers. The appointment of the National Task Force on Type Approval was one of the best things the conference has done in recent years. And it has been one of the most productive efforts.

Thanks to the strong leadership of people like Ezio Delfino and the many hours of effort that industry and weights and measures officials put into the task force, we are on the verge of implementing the National Type Evaluation Program. Thanks to the additional resources being committed by NBS to the National Type Evaluation Program we appear to be coming out of the woods on that one. The mechanics of the program are being developed and we should be able to implement the National Type Evaluation Program on or ahead of schedule. We will be considering a proposed model regulation which will be up for adoption by the Conference this week. A model regulation will make State and local participation in the National Type Evaluation Program easier and more uniform. There is also a proposal in the Executive Committee report dealing with the board of governors of the program. Type evaluation is an area in which the Conference has seen considerable progress in equipping its members with the tools to be more professional in their enforcement programs.

One other event emanating from the past is worth mentioning at this time. I refer to the development of educational and training materials. Most of you are aware of the proposals coming from your Education Committee for the development of these materials. This effort will be fully reported and discussed in the report of the Education Committee. I wanted to be certain that each of you is fully aware of the commitment the Bureau has made to the success of this enterprise. We have received the first of what we hope will be a continuing series of grants from the Department of Commerce to fund the development of training materials. A contract has been executed with the Texas Engineering Experiment Station to do the actual production from materials developed by the Conference. It is my humble opinion that this one event has done more to enhance the professionalism of each weights and measures official and eventually the entire weights and measures community than any other single event in recent history of the Conference.

Along with the assurances of commitment to the National Conference on Weights and Measures, we received a strong message from Dr. Ambler last year at Atlanta that the National Bureau of Standards can do only so much in providing resources and manpower to achieve weights and measures objectives, and that we as a Conference need to rely on our own resources to solve our problems. I agree. Dr. Ambler makes a valid point. The National Bureau of Standards ought to provide only those services that we as a Conference or as individual jurisdictions can not provide for ourselves. The National Type Evaluation Program fits the pattern, as does the development of a uniform set of training materials for use by the individual jurisdictions.

When considering those areas of activity that can best be focussed from a central point, the National Conference on Weights and Measures and the Office of Weights and Measures ought jointly to decide which of those can best be focussed through the Conference and which through the Bureau.

The decision making process has worked well in the past. In order to take full advantage of the resources in brain power and leadership that the above programs and other activities show to exist in the National Conference on Weights and Measures, the Executive Committee, with the encouragement of Al Tholen and Dr. Ambler, have proposed some mechanical changes to the organization and procedures by which we conduct our Conference affairs. You will be hearing more about those in detail. You are urged to study the proposals and give your considered advice to Executive Committee members. I hope you will vote for the proposals. We need to implement something like these in order to take fuller advantage of the leadership potential in the National Conference on Weights and Measures.

There are a number of other examples I could give about our past accomplishments and our on-going achievements. The list is by no means complete. Each of the standing committees has brought issues before you that have, by their nature, contributed to the progress of the conference and the professionalism of each of us. It is not my intent to detract from the value of the accomplishments of the standing committees by not expounding on those very real accomplishments. As a matter of fact, they are too numerous to completely cover in the time we have this week. Let me instead just say to each and every member and past member of Conference standing committees: "I salute you!"

There is one additional point that can be made. We are addressing organization and procedures of Conference administration here this week. Your Executive Committee asks your support of their proposals. At the same time, we recognize that there is still a lot to be done to improve the way Conference positions are reached. That area of endeavor will be addressed in the next year I hope.

Turning to a slightly different topic, I should like to make some remarks about the proposal to reorganize the U.S. Department of Commerce. One result of the reorganization would be to place the National Bureau of Standards under the National Science Foundation. I had earlier received information from Dr. Ambler about the proposal. There appears to be no cause for alarm on our part. We are assured by Dr. Ambler that the Bureau will continue to operate the Office of Weights and Measures in accordance with current policies. We will of course be watching the progress in this area quite closely. I am sure that the administration and staff at the Bureau will understand that, while we pledge our support of the National Bureau of Standards as they go through this period of change. We still reserve the right to offer advice and assistance when the Conference sees the need.

"Progress in Professionalism": Progress has been real. Let us not be satisfied. The progress to date should leave you, as it does me, with a sense of destiny and a feeling of excitement about the future of the Conference.

COMMITTEE APPOINTMENTS BY CHAIRMAN GREENE

The following members of the National Conference on Weights and Measures (NCWM) will be appointed to the several standing committees of the Conference.

In making the selection, I considered (a) professional experience, (b) interest in and attendance at NCWM, (c) field of interest and special qualifications for a particular committee, (d) State vs local representation, (e) industry or private sector affiliation (where appropriate), and (f) regional location and representation.

The new appointees are:

COMMITTEE ON LAWS AND REGULATIONS

Mr. Trafford Brink, Director of Weights and Measures and Retail Inspection, State of Vermont, is appointed for a five-year term to replace Mr. John Bartfai, whose term is expiring.

COMMITTEE ON SPECIFICATIONS AND TOLERANCES

Mr. Kenneth Butcher, Inspector, Weights and Measures, State of West Virginia, is appointed for a five-year term to replace Mr. Lacy DeGrange, whose term is expiring.

COMMITTEE ON EDUCATION, ADMINISTRATION, AND CONSUMER AFFAIRS

Mr. Stan Darsey, Chief, Bureau of Weights and Measures, State of Florida, is appointed for a second five-year term.

COMMITTEE ON LIAISON

Mrs. Peggy Adams, Chief Sealer, Bucks County, Pennsylvania, is appointed for a five-year term to replace Mr. Edison Stephens, whose term is expiring.

Certificates of Appreciation

Chairman Greene presented Certificates of Appreciation to:

John J. Bartfai
Stan Darsey
Lacy DeGrange
Edward Heffron
Edison Stephens

L&R Committee
Education Committee
S&T Committee
Liaison Committee
Liaison Committee

ON THE ROAD AGAIN

An address by Dr. Ernest Ambler
Director, National Bureau of Standards

This past year has been one of decision, commitment, and accomplishment. I am very pleased to be with you in Sacramento to review those accomplishments and for us to recommit ourselves to progress through the professionalism that has been described so well by Chairman Greene.

Last year, in Atlanta, we explored the challenges to be overcome in the context of defining, as our Conference theme stated, "The Direction for Weights and Measures at the Crossroads." Then, we were facing many challenges. One of the most significant was, and still is, the struggle to control the cost of Government. At the same time, we in government, State, local, and Federal alike, were faced with complications and complexities of services that increased the expectations of our constituencies.

We made some major plans last year at the Crossroad. After reviewing the progress made since Atlanta, I am confident we have moved out of the Crossroad of discussion and are "On the Road Again" toward a major upgrading in the professionalism of Weights and Measures nationwide. If we carry our plans to fulfillment, we shall have attained major advances in the technical basis and administrative procedures of our State and local Governments; this will have been accomplished without major increases in program funding.

One of the keys to moving forward was a definition of the proper roles each of us, the National Bureau of Standards, the National Conference, the States, and industry should play. By clearly defining those roles, we were able to plan our respective responsibilities within our resources.

You will recall that I highlighted in Atlanta those roles that were clearly NBS responsibilities. They were to:

- o Continue sponsorship of the NCWM
- o Insure the basic capabilities of the State laboratories
- o Coordinate the development of the National Type Evaluation Program, and
- o Support the Conference in developing training materials in response to the introduction of electronic technology in the marketplace.

I will review the accomplishments in each of these programs (the Conference, the State laboratories, the Type Evaluation Program, and Training Materials) since Atlanta.

The questions to be addressed are:

- o How far have we come?
- o Are we on schedule?
- o What do we need to do this week?
- o What do we need to do next year?

SPONSORSHIP OF THE CONFERENCE

First, I'll address the National Conference and its evolution. I view the continued growth of the Conference and the work of its committees to be of prime importance. The recent increase in the activities of the Conference has been very impressive. I congratulate your leadership for its planning and for putting in place procedures to deal with the various challenges they have faced. The move to involve the total membership, including representatives of industry, in the workings of your committees has paid big dividends. Progress is faster and the technical content is better.

I note that you are considering some realignment of committee activities this week. I believe the recommendations of your leadership, through the Executive Committee, are very appropriate and would result in greater efficiencies in the functioning of the Conference.

I especially encourage you to endorse the recommendations of your Executive Committee in the following actions:

1. Upgrading the Executive Committee to perform those functions normally associated with such a body.
2. Abolishing the Policy and Coordination Committee and the transfer of its functions to the new Executive Committee.
3. Assigning the new role of "Board of Governors for National Type Evaluation" to the Executive Committee.

I believe the establishment of Technical and Advisory Committees to support the Standing Committees in addressing some of the new issues has proved to be very effective. I encourage you to continue this practice and to include representation from the overall conference membership in the workings of these committees.

I also encourage you to continue to review mechanisms to more closely interrelate the activities of the four regional Weights and Measures Associations with the National Conference. I believe that, if such a mechanism could be developed, the regions could provide additional insights and advice to the conference committees and, in many instances, function to screen and resolve issues without the necessity of placing them on the agenda of the National Conference.

Much of the administration of the Conference has been streamlined. I am sure that the Executive Secretary will continue to seek ways of improving the operation of the Secretariat, and to bring additional information to your membership. This will provide a broader understanding of issues before you (the Membership) are expected to make decisions on those issues.

The Office of Product Standards Policy, under which Al Tholen and his associates operate, has recently acquired a new computerized system to upgrade the capabilities of the various offices under its supervision. A major computer capability has been installed in the Office of Weights and Measures to serve the needs of the National Conference.

And, if I might suggest it, perhaps we could rent or borrow compatible equipment for the secretaries to use at the Conference. This would make the extensive revisions more efficient and eliminate much of the overnight typing.

I also encourage your leadership and the Special Study Group on conference membership to seek means of increasing your membership to insure that all parties and organizations having interest in the marketplace are brought under the umbrella of the Conference so that their views and their knowledge can be included in your deliberations.

STATE LABORATORIES

Let me now say a few words about the State Metrology Laboratories.

The State Laboratories are, of course, most closely associated with the National Bureau of Standards. They are the mechanism through which measurements, traceable to the national standards, are provided to regulatory officials and local industry and business. The health and continued growth of the capabilities of the State labs is a prime interest of mine. The Bureau has a role to play in training State metrologists and auditing measurement competence at the State level.

I understand that currently there are 85 trained metrologists functioning in the State laboratories. This total continues to increase steadily. The increase reflects a growing recognition of the kinds of services that can be provided locally. These are driven by new demands for regulatory and commercial use of measurement, which stem from changes in the nature of services requested of your laboratories. State services must plan to serve their local needs, needs which, like the rest of our society, are growing more complex.

With the completion of the State Standards Program about five years ago, we turned our attention to the continuing need for technical and administrative progress of the laboratories. There are variations in the needs in the various States, and these are reflected in differences in services provided by the individual States. Until recently, we certified the State laboratories on an equal basis; that is, the

certificate issued annually by the Bureau was identical for every State. We decided that our procedures should be changed because of the large differences among laboratories that have evolved in the past decade. Consequently, we developed and have instituted this year a new program of laboratory certification. We evaluate each laboratory individually and determine in which areas of measurement competence that laboratory can qualify for certification.

Beginning with 1983, we began issuing certificates that are tailored to the capabilities of each individual State laboratory. I realize that this has resulted in some surprises and disappointments to some laboratories. As a matter of fact, several State laboratories are not certified at all. Other laboratories have very limited certification. We have found, however, that this new program has resulted in several States taking positive action either to regain their certification or to broaden the areas for which they are certified. I am very pleased to note that we have a new State laboratory in Kansas. I am also told that several new laboratories have been funded for replacement or improvement; other changes are being considered by State legislatures and Departments. We will continue to work with any State looking to attain certification or increasing its capabilities.

TYPE EVALUATION

Now, to a subject of more recent vintage, type evaluation.

Again, as the United States economy has grown in size and as new commercial devices are introduced into commerce that incorporate electronics and microprocessors, it became evident to your leadership that the whole subject of device regulation was due for some serious examination. And you made that very clear to us at NBS.

Several years ago the Conference established a Task Force on National Type Evaluation. I have been impressed with the thoroughness and dedication with which that Task Force has operated. Again, I believe you were very wise in bringing together on the Task Force representatives of both regulatory and industry organizations. Last year, in Atlanta, I spoke in some detail about the Bureau's commitment to a Nationwide Type Evaluation Program. The concept put forth by your Task Force called for:

- o A single evaluation of a new type device or system
- o Acceptance of that evaluation by the various jurisdictions
- o Commitment to develop test criteria and procedures.

I would like to restate my belief that the attainment of these features of the system is essential if NTEP is going to be effective.

We at the Bureau have an important role to play in the development of this system. We have a responsibility to establish the criteria to serve as a basis for authorizing testing laboratories in the system. We have a responsibility for evaluating the results from those testing laboratories and making the decisions on the issuance of Certificates of Conformance. We realize that we have a continuing role in providing technical support to the various committees developing criteria and procedures to be followed by the authorized laboratories.

You have some very important decisions to make this week regarding the National Type Evaluation Program. Your leadership is recommending the adoption of a model regulation for National Type Evaluation. The Task Force and, subsequently, the Laws and Regulations Committee and the Executive Committee, have dealt with this subject and are recommending to the membership the adoption of a model regulation which has been printed in your Announcement Book.

My staff at the Bureau, including my Legal Advisor, has worked with the Task Force and your committees in the development of this Model Regulation. I urge you to vote in favor of the model, which is required to serve as the basis for:

- o Recognition of National Type Evaluation
- o Recognition of testing laboratories
- o Recognition of the Certificate of Conformance
- o Reciprocity among the jurisdictions.

Without such a regulation to serve as the legal basis for a National Program, the other elements which we are all working on, would be seriously limited.

I encourage you also to vote in favor of the additional sections developed for inclusion in the Draft Handbook designed to provide the criteria and testing procedures for evaluation of devices.

These issues are extremely important, and I believe if we keep moving according to the schedule I suggested to you in Atlanta last year, we can implement the NTEP Program in October of 1984 as planned.

TRAINING

My fourth subject is key to the future of Weights and Measures in all its activities; training.

As I noted last year, we each have rather specific responsibilities regarding training. I believe that the delivery of training, that is, the actual conduct of the training of your employees, is a primary responsibility of the State and local jurisdictions. The only major exception to that is the training of State metrologists which we accept as an NBS responsibility.

Training provided by the States, both technical and administrative, should be uniform among the States. I also agree with the conclusion of your Education Committee that the basis for such uniformity today is rather sparse.

Consequently, I agreed to make arrangements to fund the initial development of uniform training materials by the Conference through a grant to the Conference. As you probably know, such a grant was awarded by NBS to the Conference effective the first of February of this year. I am very pleased that the Conference, in turn, has negotiated with the Texas Engineering Extension Service for contractual support in the development of these materials.

I want to compliment the Education Committee for developing a rather complete plan, including the establishment of a series of Working Groups for the development of the basic materials that will be used by Texas A&M in developing a series of technical textbooks and instructors manuals. I was also very pleased to hear that the nominees for these working groups all agreed to serve and are working to develop draft textbooks in several device areas.

I also want to compliment the leadership of your Conference for establishing mechanisms to supervise the development of these materials and to manage the grant and contract monies provided to get this work underway.

At the same time that we are looking forward to the evolution of these training materials, I urge you to keep an eye on a related goal, that is, the development of State inspector certification programs. The existence of uniform training manuals and their proper use in State training programs will be the basis for more rigorous inspector recruitment and training practices. Such a goal is important if we are to continue to attract the right type of Weights and Measures official into your State programs.

And so, these actions prove, in my view, that we all have recognized the challenges facing us today and in the next several years. Last year we examined these challenges and arrived at a series of decisions. At the crossroads we set the direction we were going to take. I believe this past year has been especially noteworthy in the progress that we have made. I believe we are well on our way, and on schedule.

I would like to repeat for emphasis that there is much yet to be done. The acceptance by this Conference, this week, of the recommendations of your leadership will keep us moving toward our overall goals.

OTHER ACTIVITIES

Let me now address a few additional subjects which you are dealing with and which are important.

The Conference Leadership is on the right road in examining the entire issue of package inspection and control. I encourage you to continue to study alternatives related to where and how the many hundreds of millions of packages produced in this country annually can be regulated. There is a need to regulate in a manner that recognizes the evolving modern packaging concepts and distribution practices as well as the inherent physical characteristics of commodities.

A key element in any system of this kind is the standards applied. The source of the inspection standards is embodied in the new NBS Handbook 133, which we recommend highly. As you know, we are currently considering some changes in that Handbook prior to publishing a second edition. We appreciate the constructive comments provided by the States and by the industry. I believe it is important that we all agree on a single document to serve as the basis for package regulation. I encourage you to study the document, to seek training in its implementation, and to apply it. Your Task Force on Package Control is bringing all of the pieces of this issue together. They are working toward developing an overall Conference position regarding this subject (including the use of Handbook 133 and the proper recognition of Moisture Loss in Packaging and Distribution).

Another subject that evokes a considerable amount of emotion is the regulation of petroleum products. I am well aware of the position that some would have us take, that is, to move immediately into temperature compensation at all levels of product transfer. I have had a rather steady correspondence with my friend, George Mattimoe, and his co-worker of Hawaii on this subject. This is a very interesting subject technically and philosophically. I note that the Conference has dealt with this subject many times in the past. I am aware that you have developed and included in Handbook 44 requirements dealing with Automatic Temperature Compensation for LPG Liquid Measuring Devices. I also have noted the results of the seminar sponsored by the Conference and held at the Bureau of Standards four years ago. Two years ago, your S&T Committee recommended inclusion in Handbook 44 of a requirement for temperature compensation on Vehicle Tank Meters. They very carefully worded their intent in this recommendation which was to establish the basis for uniform approaches to Automatic Temperature Compensation. This recommendation, made at the sixty-fifth Conference in 1980, was not accepted by the membership.

The S&T Committee appears to be dealing with this subject in a very responsible manner, and I encourage them to continue to evaluate the appropriateness of changes in Handbook 44, and encourage you, the membership to study the evolving technology and economics of this and other subjects in order to insure that the marketplace is maintained in a uniform and equitable manner.

Finally, there is one additional item which I think may be on the minds of many of you and about which I should perhaps say a word or two. I refer to the proposal by the President to reorganize the Department of Commerce through the establishment of a Cabinet level Department of

International Trade and Industry. I have furnished the Director of each State Weights and Measures Office a package of material describing that proposed reorganization. One part of that proposal is the transfer of the National Bureau of Standards to the National Science Foundation.

As this proposal winds its way through the Congress, I want to assure you that nothing in this proposal will interfere with the strong ties of the National Bureau of Standards and its dedication to the functions, mission, and objective of the National Conference on Weights and Measures. Lest there be any concern on the part of the members of your organization, members of the Congress, or the general public, I intend to state that commitment in a firm and positive manner in my interactions with the Congress. Moreover, I can assure you that this commitment also constitutes the sentiments of Stanley Warshaw, the Director of the Office of Product Standards Policy, and Al Tholen, the Chief of the Office of Weights and Measures.

WRAP-UP

In summary, I am very optimistic about the current health of the commercial weights and measures system. I am very pleased that we have worked together to develop new programs to deal with new needs. We made substantial progress in the past year. We agreed on what had to be done and have moved responsibly toward bringing about the necessary changes. We are on the road again, on a road that will keep us working together with a clearly defined agenda.

We now have a better understanding of the roles we each need to play in order to effectively use the resources provided to us by our Congress or State legislatures. Our plans for continued effectiveness of the Conference, growth of State laboratories, establishment of a National Type Evaluation Program, and the development of training materials is progressing very well.

We need to continue to sharpen our understanding and define our programs in other areas such as package inspection and control, petroleum measurement, and new marketing techniques and strategies.

I always enjoy working with you through this Conference, and I am looking forward to our traveling together toward our overall goal of insuring equity and uniformity in the marketplace based on programs built through technical competence and regulatory innovation.

We, at the Bureau, will continue to work closely with you. I congratulate you on the major progress made, and strongly encourage you to take those additional major steps this week and in the next few years that will keep us on the road leading to the equity and uniformity that we all seek.

I assume most of you have heard Willie Nelson's hit song, "On the Road Again." I'd like to close with a slight parody of the lyrics of that song which reflects my feelings at this time:

"On the road again,
I'm glad that we are on the road again,
The life I love is making progress with my friends,
I'm glad we're moving on the road again."

My Friends —

Thank you.

PRESENTATION OF HONOR AWARDS

Dr. Ambler presented Honor Awards to members of the Conference who, by attending the 68th Conference in 1982, reached one of the attendance categories for which recognition is made--attendance at 10, 15, 20, 25, and 35 meetings.

Award Recipients

35 Years

Samuel H. Christie, Jr.	Retired, State of New Jersey
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25 Years

James R. Bird	State of New Jersey
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15 Years

John V. Pugh	State of South Carolina
George E. Mattimoe	State of Hawaii
Anthony J. Ladd	Electronic Weighing & Packaging Systems
Robert B. Jones	Salem County, NJ
David E. Edgerly	National Bureau of Standards
Stan J. Darsey	State of Florida
John M. Chohamin	Middlesex County, NJ
Dean Brahos	City of Hammond, IN

10 Years

George W. Staffeldt	City of Mishawaka, IN
Robert W. Probst	State of Wisconsin
Gaylon M. Kennedy	State of Maine
William V. Goodpaster	Murphy Cardinal Scale Co.
Charles E. Forester	State of Texas

OVERVIEW OF THE U.S. STANDARDS SYSTEM --
ANSI's ROLE IN NATIONAL AND INTERNATIONAL STANDARDIZATION

by Donald L. Peyton
President, American National Standards Institute

Thank you very much for inviting me to be with you. It has been many years since ANSI met with the National Conference on Weights and Measures. We welcome the opportunity.

In preparing for this presentation I had to do a lot of homework. Al Tholen was kind enough to provide me with excellent material, including a very fine brochure on the organization and procedures of NCWM. He also supplied conference proceedings and a collection of NBS Handbooks 44, 130, and 133. You should be justifiably proud of these documents. You fellows do great work.

If I have any message to leave today, it would be to suggest that you broaden your horizons, become an active part of the national consensus standards system, and take a more active role in "world" standards and metrology. In the latter I am not only seeking increased participation by State and local officials in international standardization work of ISO, IEC, or OIML, as important as these groups are. I am also seeking your help to bring the fruits of your efforts -- your hands-on experience -- to the people of some of the newly emerging nations with which ANSI is now associated. What you have done for local communities, and the trust territories, you can now do for the newly independent nations of the Pacific which can constitute important new markets for American products and services.

About 17 years ago when someone suggested that I leave the comfortable, but sequestered halls of the U.S. Chamber of Commerce in Washington to take over direction of the American Standards Association, I viewed the move with considerable alarm. Not only was this outfit in New York City (which is no place for a small town boy) but it was in a line of work that was strange and confusing to a Washington lobbyist.

The individual who was responsible for my agreeing to try to reconstitute ASA and rebuild its programs was the late Malcolm W. Jensen, director of the Office of Weights and Measures. Mac had a vision of coordination between the National Conference and the outside world of standards that has still to be fully recognized and appreciated.

I understand that it is the responsibility of the NCWM Committee on National Measurement Policy and Coordination to "serve as a policymaking and coordinating body in matters of national and international significance which may include such areas as metrication, International Organization for Legal Metrology (OIML), American National Standards Institute (ANSI), and International Organization for Standardization (ISO)..." ANSI would welcome the opportunity to work more closely with

(ISO)..." ANSI would welcome the opportunity to work more closely with the Conference in all these fields. We frankly did not know that such a group existed.

ANSI is also vitally interested in the work of the Committee on Laws and Regulations because we also encourage uniformity of application and adoption of many voluntarily developed national codes. Another committee of importance to voluntary standards organizations is the Committee on Specifications and Tolerances. There is a good deal of carry-over and possibly some overlap and duplication in standards, specifications, and testing methods that could be avoided if there were closer coordination.

I suspect that the problem (if there is one) lies in the lack of knowledge and communication between the National Conference, ANSI, and the hundreds of standards developing groups ANSI coordinates. My purpose today is to introduce you to the "world of voluntary standards."

We have a great deal of respect for the National Conference. ANSI and NCWM are in effect both offsprings of at least one of the same parents. NBS founded NCWM in 1905. In 1918 NBS (Department of Commerce) joined with the Departments of War and Navy and five professional societies to voluntarily establish the American Engineering Standards Committee -- ANSI's predecessor organization. The purpose of AESC was to "provide a voluntary mechanism for coordinating the development of engineering and related standards." Voluntary as contrasted with regulatory coordination was recognized by Government and private sectors to be preferable in 1918. We can find no reason to think otherwise today.

The NCWM and ANSI are survivors. Think of it this way: We have both survived two World Wars -- several police actions -- many periods of international unrest -- a great depression -- and many cyclical recessions (including the one from which we are just now emerging). There have been 13 Presidents and 72 sessions of Congress since ANSI was founded 65 years ago. You are even older.

My presentation on ANSI's role in national and international standards is not a "sales pitch" for a change in what the Conference is doing. It is rather the opening gambit in an interchange of ideas and possibly a suggestion as to how you can make your work even more effective and appreciated.

All organizations must stand ready to try out different approaches -- to embark on climate improvement. Dare I say climate control? I firmly believe that dynamic organizations must do what they can to improve the climate in which they work and live.

The ability of an organization to bring about improvements is limited only by whether it has the ability, desire, and intestinal fortitude to be a "rainmaker" or whether it is satisfied to simply look out the window and carry a protective umbrella. In the field of standards there

are far too few rainmakers. Some lack authority. Some lack the will to seek authority. Some shy from both authority and responsibility.

From my limited exposure to the National Conference I would characterize it as a potential rainmaker. The superb work you have already done leads me to conclude that you have "seeded the clouds" and begun the rain dance. With affirmative response from State and local constituencies, NCWM will continue to create an improved climate for legal metrology.

The U.S. Standards System

The unique U.S. system for developing and promulgating standards is a decentralized mechanism operating under principles of voluntary action, peer acceptance, and verifiable consensus.

One must have a healthy respect for pragmatism if one is to work in the U.S. system. There is an underlying tenet which has been present from the beginning, that is: Need should dictate standards; standards should not dictate need. Unlike some of its national counterparts, the U.S. voluntary standards system provides opportunity rather than authority.

The U.S. Structure

There is not one structure for standards development in the U.S. There are several. Four major "systems" exist and are active in developing standards. These are: Government, Company, Independent, and Coordinated.

1. The Government System mandates standards by law or regulation for many purposes, including Government, procurement, health, safety, environmental protection, and weights and measures.
2. The Company Standards System. Companies develop standards for internal use or for their purchases. Some are nationally recognized because of the size of the enterprise, but the documents are nominally intended for company use.
3. Trade, Technical, Independent Groups. Some trade, technical, and professional groups prefer to develop their own standards. These range from the trade associations, which develop highly sophisticated standards for use by their members, to large, well-organized industrial groups dealing directly with government; e.g., aerospace, telecommunications, and food and drug.

4. The Coordinate System. 250 professional, technical, engineering, trade, labor, consumer, and governmental organizations voluntarily associate themselves with ANSI's procedures and voluntary coordination. The standards of these groups are developed and submitted to ANSI for approval as American National Standards.

ANSI believes that while these categories do exist, they should all seriously consider operating under ANSI's voluntary coordination. The door is open to everyone at all times. We would welcome organizations not currently involved. We would welcome their standards.

How Are We Doing?

While some groups remain "outside the fold" there has been remarkable increase over the years in both the number of organizations that use the ANSI system and in the growth in available American National (consensus) Standards. For example:

	<u>1967</u>	<u>1982</u>
Organizational Members	50	240
Standards Actions	300	1,000
Approved Standards	3,000	10,000+

Hidden Structure

There is an amazing degree of discipline, order, and due process in the voluntary standards system. Developers of standards, whether working under the aegis of ANSI or not, are subject to the same laws as everyone else.

There is no exemption, for example, from antitrust. The Sherman, Clayton, and Federal Trade Commission Acts are applicable and are at times brought to bear. Tort liability is an added incentive to produce the best possible standards.

Standards developers soon learn to recognize the power of public opinion and the necessity to act at all times "in the public interest."

Above everything else there is the marketplace, which is the ultimate test for standards and certification programs. Good standards are used. Bad standards remain on the shelves.

The need for standards to provide basic shelter, food, transportation, and environmental "wants" of our citizens — to provide for safety in the workplace — to provide safe and effective consumer products — makes the U.S. voluntary standards system "people oriented."

ANSI provides the common bond of national coordination, a clearinghouse for information, and independent verification of consensus of standards. ANSI has no legal authority and seeks none. It depends upon voluntary participation by organizations and individuals and upon peer and public acceptance of its role and functions.

ANSI's Role in National Standardization

ANSI is the voluntary coordinator of the U.S. standards system. It is an organization of standards competence dedicated to bringing to bear on standards needs the cooperative efforts of

- o Commerce and Industry
- o Standards Developing Organizations
- o Public and Consumer Interests

In coordination ANSI enlists the support and participation of

- o Technical Societies
- o Scientific Organizations
- o Labor Organizations
- o Professional Organizations
- o Government Groups
- o Trade Associations
- o Consumer Groups

Establishing Consensus

ANSI administers the voluntary system for verification of consensus on standards through public review and comment.

Standards that evolve serve the needs of:

- o Industry
- o Consumer
- o Government
- o Labor
- o General Public

Approval

When standards are submitted to ANSI for approval as American National Standards (from three main sources), they are sent to the Board of Standards Review. Standards boards are consulted as required. The Consumer Council Standards Screening and Review Committee reviews and rates standards of direct interest to the consumer.

ANSI's work product is standards (10,000+).

It publishes an annual catalog and bimonthly supplements.

The ANSI Structure

Board of Directors/Executive Committee

3 key advisory councils - Company, Organizational Member, Consumer

5 operating councils:

 Certification

 Executive Standards Council - Standards Boards

 Audit and Accreditation

 Board of Standards Review

 International Standards Council/USNC-IEC

Procedures

ANSI operates its coordination and approval systems under well-defined procedures that have peer acceptance. The only "authority" that ANSI wields is voluntary persuasion — nothing more — and the "governed" decide if what we are doing is acceptable.

One thread runs through all due process. At bottom ours is a society built on individualism, competition, and success. These values bring great personal freedom and mobilize great energies. At the same time they can arouse temptations to push aside one's competitors, to cut corners, to ignore the interests of others in the struggle to succeed.

In such a world, much responsibility rests on those who umpire the contest. As society demands higher standards of fairness and decency, the rules of the game tend to multiply and the umpire's burden grows constantly heavier.

The field of legal metrology is yours.

The standards contest is ANSI's. ANSI serves as the "umpire," just as do weights and measures officials. Our respective burdens of responsibility continue to grow.

International Standards

ANSI serves as the U.S. member of two major international nongovernmental standards organizations: the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC) (through the U.S. National Committee of IEC). ANSI is also the U.S. member of the Pacific Area Standards Congress (PASC), which is a regional forum for discussing and solving problems.

ISO and IEC serve as the focal points for standards in fields not covered by intergovernmental bodies. Many international standards bodies are governmental, e.g., International Atomic Energy Agency, Food and Agriculture Organization, World Health Organization, and Organization for International Legal Metrology (OIML). Most of these groups maintain close liaison with ISO or IEC or both.

ANSI provides the annual membership subscriptions to ISO and IEC, and is responsible for technical participation. ANSI is responsible for the administration of 241 technical secretariats.

You are no doubt aware that as a result of the last major GATT multilateral trade negotiation, the so-called "Tokyo Round," an international standards code (GATT Code) was negotiated. In the U.S. the provisions of the GATT Standards Code were incorporated in the Trade Agreements Act of 1979.

The Trade Act establishes rules for Federal agencies engaged in standards-related activities. Section 403 of the Act requires the President to take reasonable measures to promote observance by State and local agencies and private parties to such rules. Voluntary guidelines for State and Local Governments and Private Sector Bodies were issued by the Commerce Department in December 1982. NBS can provide you with additional information.

To the best of my knowledge U.S. voluntary standards procedures, based upon consensus, openness and due process requirements, create no unnecessary barriers to trade. The same cannot be said for some regulatory measures. But there are ample opportunities for everyone to comment on regulations and redress any grievances they may have.

ANSI and the Government (Federal, State, and Local)

ANSI works with government at all levels. The Federal Government references and adopts many voluntary standards. For example, they are referenced in more than 200 OSHA standards, several hundred Federal procurement specifications, and in MIL Specs.

According to a recently issued Federal Register report, the total adopted or referenced by Federal departments and agencies exceeded 3,000.

The real impact of standards, however, is at State and local levels. Wide use of the ANSI-approved national codes are examples -- Boiler and Pressure Vessel Code; National Electrical Code; Fire Code; Elevator Code; and a myriad of building codes.

State and local governmental officials are active on many national committees and often comment on proposed standards. Building departments, water districts, power authorities, motor vehicle administrators, electrical and fire inspectors, and labor and health departments are an integral part of the ANSI national consensus. ANSI welcomes direct input and personal participation from the National Conference on Weights and Measures.

As I mentioned earlier, ANSI welcomes closer ties with the NCWM Committee on Specifications and Tolerances. Many years ago we suggested that it could be worthwhile to develop standards for measuring devices, scales, and sundry apparatus under ANSI's consensus procedures. We repeat the "offer" in case the Conference decides to reconsider.

Even though specifications and tolerances are developed within the Conference, it would not hurt a bit to expose them to public review and comment via ANSI's Standards Action. SA -- the most comprehensive single information source in the standards world -- provides information on national and international voluntary standards, international regulations, European and Japanese standards and, most recently, the proposals of OIML. Why not include NBS handbooks?

In closing I want to offer the Conference and the NBS Office of Weights and Measures an opportunity to "star" in an important trans-Pacific Conference to be held in San Francisco, California, in late June of 1984.

PASC X -- the forum of Pacific Rim countries -- will meet then. PASC members have requested that the U.S. provide a one-day seminar and/or demonstration of topics of interest to developing and emerging countries. We have several new nations in the Pacific. All are potential trading partners with the United States. Because this is the first PASC meeting to be held on the American Mainland (we had two in Hawaii), we are also inviting the national standards bodies of Latin America.

We would like to invite you to put on a seminar and provide "hands-on demonstrations" of how to apply standards to legal weights and measures. We know that the State of Hawaii has done this in some of the trust territories. We would like to show the people of the Pacific that the U.S. and ANSI are concerned with their needs -- that we want to help them with metrology and standards -- that we care. Come share your experience with those who are reaching out for help. If we turn away, competitors in Japan, Canada, and Europe are waiting to take over. I am confident that you will welcome this opportunity.

Thank you again.

LATEST DEVELOPMENTS IN THE WEIGHTS AND MEASURES AND TRADING STANDARDS SERVICE IN THE UNITED KINGDOM

Presented by Anthony Paul Allen, Chairman
United Kingdom's Institute of Trading Standards Administration

The Institute of Trading Standards Administration celebrated its centenary last year in Manchester. In its 101st year the Institute has decided to produce an Annual Report which reflects the work of the comprehensive service in a positive way and which demonstrates the problems and complexities of maintaining and promoting fair trade in the rapidly changing technological world of the mid-eighties.

What is I.T.S.A.?

The Institute of Trade Standards Administration is the professional organization representing some 1500 Trading Standards and Consumer Protection Officers who enforce over 600 Acts, Regulations, and Statutory Instruments in the trading standards field throughout the United Kingdom.

In 1982 the Institute received a Study Contract from the European Commission to produce a comprehensive Directory of Trading Standards Legislation showing the national implementing legislation for all 10 Member States, accurate to 1st July 1983.

Lack of uniformity in the administration of early weights and measures legislation prompted local Inspectors of Weights and Measures to unite in an endeavor to influence legislation and promote common action on its administration. This they did in 1894 under the title "The Incorporated Society of Inspectors of Weights and Measures." It is worth noting that the earlier aims of the Society are still among the Institute's prime objectives, which are -

to advance the legal, technical, scientific, practical, and general knowledge of persons engaged in the administration of legislation relative to fair trading, quality, quantity, and safety and to give advice to consumers and traders."

Such aims are achieved through national, regional, and local conferences and seminars, legal and technical publications, a monthly journal, and a weekly Confidential Information Service.

Uniformity of Weights and Measures in Magna Charta

The earliest statutory declaration for uniformity of weights and measures in the United Kingdom is contained in the Magna Charta of 1215:

"There shall be but one measure of wine throughout the realm and one measure of ale, and one measure of corn, that is to say, the quarter of London; and one breadth of dyed cloth, russets and haberjects, that is to say, two yards within the lists. And it shall be of weights as of measures."

The Trial of the Pyx

The proceeding known as "the Trial of the Pyx" is the examination of coins by a jury entirely independent of the Mint in order that it may be ascertained that gold, silver, and cupro-nickel coins made by the Royal Mint in accordance with the Coinage Acts 1870-1971 are of proper weight and composed of metal of the degree of fineness or composition required by law.

This trial is carried out annually by the Goldsmiths' Company of the City of London. Under the Mint indentures by which Masters of the Mint were formerly bound, and since 1870, under the Coinages Acts, it has been provided that the Officers of the Mint shall place in the Pyx (or Mint Box) certain sample coins of currency issued from the Mint, and that these sample coins shall be periodically examined by a jury of members of the Company who are specially sworn by the Queen's Remembrancer in accordance with directions issued by the Treasury.

The Trial of the Pyx is of very ancient origin, for there is reason to believe that an examination of the justness of the coinage of this country by assay and comparison with Trial Plates were practiced as early as Saxon - or perhaps even Roman - times, and there is record of a public Trial in the year 1248 before the Barons of the Exchequer by a jury of "twelve discreet and lawful Citizens of London with twelve skillful Goldsmiths of the same place."

For the purposes of the trial, a specified number of coins is required to be placed in the Pyx and produced by the Officers of the Mint. Officers of the Standards Department of the Department of Prices and Consumer Protection produce the standard trial plates of gold, silver, and cupro-nickel, and the weights in their custody for the Clerk at the Trial.

The Queen's Remembrancer charges the jury, composed of members of the Goldsmiths' Company, and administers the oath prescribed in the Trial of the Pyx Order 1975 made in accordance with the Coinage Act 1971. The jurymen first check the number and denomination of the coins in each packet to see that the proper number has been produced, and then weigh the coins in bulk, as well as selected samples, to ascertain that the average weight of the coins is within the "remedy" or tolerance allowed by law. Afterwards members of the jury carry out assays to test accurately the fineness or composition of the metal by comparison with the standard trial plates, and to ensure that it is within the prescribed "remedy." They also measure the diameters of sample coins to

ascertain whether they are within the tolerances allowed. The verdicts of the jury are delivered to the Queen's Remembrancer in May in the presence of the Chancellor of the Exchequer, who is Master of the Mint, or his Deputy, and are subsequently published in the London Gazette.

National Information Service

In the late seventies and early eighties there was an explosion of new legislation, partly as a result of our membership of the European Community and partly due to rapid changes in technology. It is therefore imperative that Trading Standards Officers have access to quick, accurate, and comprehensive guidance notes on new legislation, with a well documented and pre-packaged news service to supplement his/her existing legislative tools and investigatory skills.

Recognizing this need, the Institute appointed in March 1983 a Director of Information, DALLAS WILLCOX, who provided a similar service in his previous post for the Institute of Chartered Accountants. He will mastermind the introduction and development of a new National Information Service and it will provide local authorities with a most valuable aid to their field officers, while at the same time reducing the duplication of effort currently necessary to produce such vital information within each and every local authority.

Metrology - N.M.C.U.

The Weights and Measures Act of 1979 implemented the European Directives which required the United Kingdom to transfer from the 'minimum' system to an 'average' system of weights and measures. The transition has been relatively smooth and this is due in no small measure to the National Metrological Co-ordinating Unit (N.M.C.U.), a statutory body created by the Weights and Measures Act of 1979, to coordinate the enforcement activities of the 91 weights and measures authorities in the United Kingdom.

The second Annual Report of the N.M.C.U. confirms that both industry and the enforcement authorities have adapted to the new and complex measures remarkably well and are working together with an unprecedented degree of cooperation.

In the course of 30,000 tests and inspections on some 2 million individual packages a total of 6,000 infringements were reported by local authorities to the N.M.C.U. The great majority of cases were dealt with by warning or by advising a packer how to comply with the law. However, there were 73 prosecutions, and fines totaling £31,421 were imposed. Written instructions were issued on 74 occasions and the N.M.C.U. were able to resolve four cases that became the subject of appeal. The principle of issuing written instructions to deal with minor or technical infringements of the law is novel in trading standards law, and could merit consideration for wider application.

The main problems reported during the year related to the baking industry and to imported goods which had a reference test failure rate of 26 per cent. A special N.M.C.U. study on bread weights confirmed these were the cause of the majority of prosecutions and other infringements. As a result, priority was given to the negotiation of two special codes of practice, for Small Bakers and Plant Bakers. The Code of Practical Guidance for Small Bakers (Small Bakers Code) was approved by the Secretary of State for Trade and while it will not eliminate every problem it should promote an even more sympathetic understanding of the difficulties faced by the members of this industry.

The average system has been effective since the 1st January 1980. It controls goods packaged in predetermined constant quantities, when the purchaser is not present and so cannot ascertain, at the time of purchase, whether the weight or volume is accurately stated. The Act introduced the average system and brought the National Metrological Co-ordinating Unit into being.

The average system is designed primarily for application at the point of production or importation and concerns itself, not so much with the contents of individual packages, but with the average contents of packages as produced at the factory or in a consignment at the place of importation. It allows a certain proportion of the packages to contain less, within strict limits, than the nominal quantity, provided that the overall average is satisfactory.

Under the system, it is the primary legal duty of the packer or importer to ensure that his production passes an enforcement officer's reference test and that no individual packages are significantly deficient. A packer can achieve this by ensuring that his packages comply with three rules, often referred to as the Three Rules for Packers.

Rule 1 - The actual contents of the packages shall be not less, on average, than the nominal quantity.

Rule 2 - Not more than 1 package in 40 may contain less than the nominal quantity by an amount known as the tolerable negative error. (These packages are called non-standard packages). The tolerance varies according to the quantity stated on the package.

Rule 3 - No package may contain less than the nominal quantity by an amount more than twice the tolerable negative error. These packages are called inadequate packages.

Metrology - MEDICAL WEIGHING AND MEASURING EQUIPMENT

In Germany the Weights and Measures Inspectors carry out a regular program of verification and inspection of medical measuring equipment;

e.g. for temperature, blood pressure, and anaesthetics. Despite such a program they still find significant inaccuracies. This raises the question -

How accurate is medical measuring equipment in the United Kingdom?

The answer, in so far as Trading Standards Officers in Britain are concerned, is that we have no statutory responsibility for testing such equipment because it is not in use for trade. However, Adult and Baby weighers made available for use by the public are the exception and these are verified and inspected on a regular basis.

Perhaps, with the German experience in mind, we should now re-examine our procedures in the UK for regularly testing, not just Baby weighers, but all types of the more critical medical weighing and measuring equipment.

Metrication

In Great Britain the Metric Weights and Measures Act of 1864 legalized the use of metric terms in contracts but not the use of the metric system in trade.

The Weights and Measures (Metric System) Act of 1897 made lawful the use of the metric system for trade, and the then Board of Trade were required to keep metric weights and measures among their Standards.

In 1965 the UK Government announced a ten year program to convert our imperial system to that of the Systeme International and established a Metrication Board in 1969 to assist the voluntary change in trade and industry to that system.

The Weights and Measures Act 1976 facilitated the introduction of SI Units for trading purposes but restricted, for a temporary period, the removal of permitted imperial quantities for the retail sale of a wide range of goods.

In April 1980 the Metrication Board was abolished, and by the end of 1981 nearly all goods could be sold in metric units with the notable exceptions of draught beer, cider, and packaged milk. Sales of non-prepacked goods are still permitted and made mainly in the Imperial system.

Petrol (gasoline) can and is still sold in either liters or gallons depending on the preference of the garage concerned, although all wholesale dealings of petrol are now required to be in metric quantities.

The retail carpet trade voluntarily changed to metric sales (square meters) in 1975 but, due to adverse public reaction and competition from some retailers who refused to change, subsequently reverted back to imperial measurements (square yards).

It is interesting to note that at one of the first meetings of my professional Institute in 1894 it was agreed to petition the Government with a view to adopting the metric system of weights and measures as a matter of urgency. We are still of that view but successive governments have only been prepared to complete the change on a voluntary basis.

Positive Purchasing

Last November a Memorandum of Understanding on STANDARDS, QUALITY, and INTERNATIONAL COMPETITIVENESS was signed between the Government and the British Standards Institution. The aims and objectives of that agreement are for a stronger, more widely used voluntary national standards and quality assurance system in Britain, to support the efficiency and competitiveness of British industry.

The Institute of Trading Standards Administration heartily endorses those aims and will play its part in achieving them. Two simple examples will illustrate how the Institute is already making its contribution -

1. Copper tanks were supplied to a local authority in the West Midlands allegedly in compliance with a British Standard. On investigation it was found that the tanks were made of thin gauge copper with a much smaller heating coil than specified. Result: short life, bad circulation, and higher electricity costs. Following the Trading Standards Officers' investigation the supplier was fined £520 and the two directors £2600.
2. In East Sussex the Trading Standards Department is team leading a review of all the County Council's purchasing arrangements, commodity by commodity. On looking at cleaning equipment it was discovered that the authority was still using some 10 different makes of floor cleaner, many of which had been inherited at the time of reorganization in 1974. By evaluating the County Council's needs the choice was reduced to just two makes, both of which complied with British Standards. These were sent to an independent testing house, which advised that the cheaper of the two machines was quite satisfactory for the County Council's needs. They were then able to place a bulk call-off contract for 200 machines, which will save more than £3000 as compared to the cost of the more expensive machines. Similar exercises enabled the County Council to reduce its expenditure by 6.7 % (£200,000) on its Supplies vote in 1982/83 without reducing the quality or quantity of its purchases.

Fraud, Forgery, Conspiracy, and Deception

Gone are the days when Inspectors of Weights and Measures were mainly engaged in routine inspection and verification duties. The Trade Descriptions Act of 1968 changed all that and with the European Communities Act of '72, the Consumer Credit Act of '74, the Weights and Measures Acts of '76 and '79, the Consumer Safety Act of '78, the Animal Health Act of '81, and the Road Traffic Acts of '72, '74, and 1982, the pace and complexity of change has not slackened.

In historical terms perhaps nothing much has changed as illustrated by this quotation from the Apocrypha at Ecclesiastes 27 v 2 -

"As a nail sticketh fast between the joining of the staves, so doth sin stick close between buying and selling."

Those words would seem to suggest that unfair trading was the norm in biblical times and I am conscious of the fact that this address has inevitably concentrated on the seamy side of trade and commerce. However, my Institute firmly believes that the overwhelming majority of transactions in the UK are fair, honest, and to the satisfaction of all concerned. That having been said, there are a number of disturbing trends which call for continuing vigilance coupled with more effective legislation and rigorous enforcement in order to maintain the present high degree of protection for consumers and fair traders. Some of the problem areas are summarized below -

1. WINE FRAUD

Probably the longest investigation undertaken by a Trading Standards Department was successfully concluded last year in a 3 1/2 week trial at the Birkenhead Crown Court.

The investigation was conducted by the Merseyside Trading Standards Commercial Branch and involved the Ministry of Agriculture, Fisheries and Food, Le Service de la Repression des Fraudes, the Dutch AID and the US Department of the Treasury. The allegation was that the defendant company had exported to the USA over 250,000 bottles of Vin de Table that had started life at about 80 cents per bottle, having labeled it as prestigious white Burgundy Appelation Controlee wine, which was then sold for up to 16 dollars per bottle in restaurants, hotels, and night spots in America. The defendants were convicted of conspiracy to defraud and the managing director and general manager were sentenced to 18 months' imprisonment.

2. CAR FRAUD

Each year tens of thousands of consumers fall victim to one of the most widely perpetrated frauds in the commercial market place, namely the reversing of the odometer by the unscrupulous motor trader. Such criminal deception earns these traders many millions of pounds annually.

In 1982 a check on 573 ex-company fleet vehicles passing through the trade in a southern county revealed that at least 297 (51 %) had had their mileages substantially reduced. The illicit profit made by the traders and the financial loss to the consumers amounted to at least £75,000.

We are pleased that the Minister for Consumer Affairs has asked the British Standards Institution to investigate the feasibility of fitting tamper-resistant odometers to all new cars. (It is interesting to note that this procedure is already mandatory in at least one American State, and in Germany Weights and Measures Inspectors test and seal odometers on hire cars.) We are also encouraged by the Government's action in reintroducing the requirement for the previous owner's name and address to appear on the registration document BUT my Institute is convinced that much more is required; in particular, the licensing of car auctions and the statutory requirement to include and supply mileage details every time a vehicle changes hands and each and every time it is registered for tax. Until these or similar steps are taken this multi-million pound fraud will continue unabated.

3. VIDEO FRAUD

- (i) Piracy - the unauthorized duplication and distribution of an original video cassette with similar but different labels to the original
- (ii) Counterfeiting - as for Piracy, but with its packaging and labels complete in every detail
- (iii) Bootlegging - the unauthorized recording of an artist's performance

The rapid escalation of fraud, forgery, conspiracy, and deception in relation to video cassettes requires urgent action by Government, enforcement agencies, and the trade.

Fortunately some effective action has already been taken. Trading Standards Departments have prosecuted a large number of retail video traders under the Trade Descriptions Act and the courts have imposed heavy fines, some in excess of £50,000. However, unless the Trade Descriptions Act is amended, it cannot deal with the root cause of the problem; i.e., the manufacturers of pirated and counterfeit tapes.

The reputable trade has set up their own organization, FACT (Federation Against Copyright Theft) and have used the Anton Pillar civil action procedure with some limited success. The Government has given its support to a Private Members Bill which will substantially increase the penalties under the Copyright Act of 1956. Unfortunately that Bill, as presently drafted, does not give Trading Standards Officers either the power or the duty necessary for tackling the perpetrators of these frauds.

Conclusion

It gives me considerable pleasure at being invited to address the 68th National Conference on Weights and Measures; I have very much looked forward to my second visit to Sacramento. I do hope that the above paragraphs paint a realistic picture of some of the more important developments in our comprehensive trading standards service in the United Kingdom.

ANNUAL REPORT
OFFICE OF WEIGHTS AND MEASURES

by

Albert D. Tholen
Chief, Office of Weights and Measures

The histories of the National Bureau of Standards and of the National Conference on Weights and Measures have been intertwined for close to 80 years. Although my talk today is billed as the "Annual Report of the Office of Weights and Measures," it is, in reality, a report of the weights and measures related activities of the National Bureau of Standards in the past year.

There have been notable changes in our program, both institutionally and in various program areas. I am going to step through these highlights and summarize the essence of each, including the impact on the overall weights and measures activities.

The institutional changes of special note include: first, as you know, the transfer of the Weights and Measures Program from the National Measurement Laboratory into the Office of the Director of the National Bureau of Standards, and second, our program budget has been increased almost 50 percent.

During the year, we increased support to the National Conference on Weights and Measures and made major progress in laboratory certification, in establishing regional measurement management groups, in establishment of a national type evaluation program, and in launching a major effort in development of training materials through the award of a grant to the Conference.

The transfer of our program to the Director's Office was most helpful. The progress in the past year has largely been a result of the personal commitment of Dr. Ambler to the Conference on weights and measures in general. We can more easily get the ear of the Director when necessary; reciprocally, the Director can get to us more directly!

As a reminder of the nature of our transfer to the Director's Office, you will recall that we are part of the Office of Product Standards Policy, which is directed by Stan Warshaw. Stan's office includes three other program areas: Standards Code and Information, Laboratory Accreditation, and Standards Management.

The relocation of our program has maintained the former close relationship we have had with the OIML activities under Dave Edgerly.

In terms of funding, we are currently operating at a level of \$1,200,000 a year, substantially higher than the general level of funding for prior years. This increase in numbers does not tell the entire story. We have received approval for acquisition of new equipment which will help us make further gains in effectiveness. We now have two mini-computers dedicated to the technical upgrading of the State laboratory programs. The Office of Product Standards Policy has recently acquired a new computer network, with a major component of that system in the Office of Weights and Measures. We have procured several weight sets for use in the round robins conducted under the regional measurement management programs. Beyond that, we have developed new and stronger working relationships with several of the research divisions in the Bureau in support of various aspects of our program.

We look upon ourselves as a central resource: a resource of measurement technology. The weights and measures program could be viewed as the transfer agent of that NBS technology to the States, counties, and cities, to the National Conference, to other Federal agencies, to industry, business, and associations.

The weights and measures program functions in the following areas (several of them were emphasized by Dr. Ambler in his talk):

- o Sponsorship of the National Conference
- o Support of the State laboratory programs
- o Promotion of uniform laws, regulations, and codes
- o Standardization of weights and measures operations (including inspections and enforcement)
- o Coordination of international standards

and

- o Development of special programs (the two key activities currently under development are national type evaluation and national training).

Dr. Ambler has already addressed the sponsorship of the Conference, the support of State labs, national type evaluation, and national training. I plan to amplify a few points.

Our new laboratory certification program has evolved very smoothly and has been quite effective. The response of the States and the cooperation of the State Directors and their metrologists has been very gratifying. Most of the States are certified under the new program. As you know, the program provides very tailored certification, recognizing only those areas that we believe meet the high standards required to support the commercial marketplace.

Some States are certified in most areas of tolerance testing and calibration in mass, volume, and length. Others have more limited certification. A few States still lack the credentials to be recognized through certification. We are working with that last group of States to

assist them in attaining certification. The past year has seen some major improvement in State capabilities and facilities. New laboratories in Illinois and Kansas highlight this progress. Funding has been approved for new laboratories in other States. Administrators and legislators in still other States are considering funding for laboratory upgrading.

A key to continued expansion of State laboratory capabilities will be the activities of regional measurement management groups. The pioneer group in this program was the Northeastern Measurement Assurance Program (referred to as NEMAP). This group is composed of 11 Northeastern States plus Troemner and Toledo Scale companies. Subsequently, the Southeastern Measurement Assurance Program (SEMAP) was established, including most of the States south of the Mason/Dixon line and bordering the East Coast.

In the past year, a Western Regional Assurance Program was established on the West Coast, and the mid-MAP or mid-State Measurement Assurance Program was established in the Midwest. Plans are under way for completing this picture with the formation of a measurement program in the Southwest. These programs have paid off in many ways. First, they have provided insight into the intercomparison of standards among member States. Technical meetings have provided opportunities for the presentation of technical papers, promoting uniform procedures, and upgrading the overall knowledge and services of the participants. Their interactions with the National Bureau of Standards provide overall intercomparisons among the regions and with the Bureau. We look forward to the operation of all of these groups and the expansion of their programs.

Our support of the Conference has been highlighted by progress in several areas. In terms of publications, we are gradually automating all of the major handbooks which are basic tools of your State and industry activities. We have two new publications in draft: one on laboratory certification and a second on criteria and test procedures for use in the national type evaluation program.

We have reinstituted the tech memo series broadly distributing technical information. We have worked to make the Executive Committee function more effectively in dealing with organization and procedures and finance, and to lay the groundwork for its upgraded responsibilities as proposed by your leadership. This past year saw major contributions by the Executive Committee in the initiation of the new NTEP and training programs. We've laid the groundwork and tested more effective communications for this committee and others of the Conference through the use of formalized distribution of draft papers and collection of comments through a system of mail ballots. We have formalized the budgeting system of the Conference and placed it on a more business-like basis, investing all funds that aren't required for current expenditures.

The national type evaluation program is developing on schedule. Beginning with the approval of the concept last year in Atlanta and the approval of the first portions of the new draft criteria test procedures handbook, we at the Bureau worked with the Conference in the development of a model State regulation, related organizational plans, and development of additional portions of the draft criteria handbook. Additionally, we have developed criteria for use in authorizing State labs to function as test labs under the program. If we collectively meet our goals established for this week, we should be well on our way to an operational program beginning October 1984.

Progress in developing training materials has been equally exciting. Following the adoption of the plan developed by your Education Committee, and following-up on Dr. Ambler's proposed grant to launch the program, much has happened.

First, the Bureau awarded a grant to the Conference, effective the first of February of this year, for \$148,000. Subsequently, the Conference negotiated a major contract with the Texas Engineering Extension Service of Texas A&M University to provide technical services toward the development of these training materials. The Conference also budgeted a small amount of the grant for use in management and coordination of the work under the grant.

Several working groups were established and have begun development of basic working drafts for several of the textbooks.

No annual report would be complete without some numbers. The past year has been a very busy one, including the updating of existing or drafting of new handbooks (a total of 8). In addition to broader support of the Conference and its committees, we have increased our support of the four regional weights and measures associations. We have delivered 24 talks and conducted 28 training sessions (an increase in laboratory training and new emphasis on Handbook 133 training have added to this activity). As the Conference has increased its number of committees and participants, the technical and administrative support from the Bureau has increased proportionately. The number of committees now totals 26, with well over 100 participants representing the full spectrum of Conference membership.

The budget has been running about \$60,000 annually. With the award of the grant, the monies managed by the Conference increased from an annual basis of \$60,000 to over \$200,000 a year.

The prototype examination work load has continued to increase; some 75 reports of test were issued in the past year.

I thought this annual report would be an appropriate time to reacquaint you with the members of our staff and their areas of responsibility.

In terms of handbooks, Handbook 44 is the province of Otto Warnlof; the 105 series, both Henry Oppermann and Otto; Handbook 112, Otto; Handbook 117, Steve Hasko; and Handbooks 130 and 133, Carroll Brickenkamp (in the case of 133, Steve Hasko is also an author).

Carroll works in the areas of grain moisture, laws and regulations, and liaison with selected NBS research divisions. Steve deals with LPG. If your question is metric, Lou Barbrow is the man. Carroll deals with packaging and labeling and testing. In the area of distance measurements, call Steve Hasko. Our electronics advisor is Joe Kim. If you are dealing in field standards and equipment, either Otto or Henry will assist. In the type evaluation program, I am involved in policy issues; Henry Oppermann with device testing; Otto or Henry with technical questions.

The operation of the Conference is split; if you have general questions or overall administrative questions, give me a call; if your questions are more detailed, call Ann Heffernan.

Specifications and tolerances are handled primarily by Otto and Henry. Support of the State laboratories and the regional measurement groups is the responsibility of Henry.

Dick Smith is responsible for developing our overall training program; he personally is involved with general support of State and regional training sessions. Henry Oppermann handles the metrology training. Otto Warnlof handles the support of the OIML activities.

You can see that we cover a lot of ground with few people. The increase of resources in the program from the Bureau has resulted in our ability to strengthen ongoing work and to undertake some major new thrusts. Although we've made progress in the past year, our future progress is going to depend on our joint commitment to these programs and to the continued investment of your time and our time in doing the hard work necessary to bring our goals to fruition. The opportunities are there, and I appreciate the generous support and assistance that you, the membership of this Conference, brings to all of these programs.

In a few years from now, the fruits of our efforts will have materialized into a strong solid network of State laboratories, State programs flourishing with the materials required for training staff members, and with a nationwide type evaluation program featuring a single evaluation of any new device or system. I hope you are as excited about this potential as I am.

Thank you.

A SURFACE-DEPENDENT THERMAL EFFECT IN MASS CALIBRATION

by

R. M. Schoonover and J. Keller
National Bureau of Standards

INTRODUCTION

Occasionally in the measurement of mass by means of a statistically characterized calibration process, the authors have observed measured values that, upon repetition, disagree by an amount that considerably exceeds the estimated measurement uncertainty. These anomalies are most often rationalized¹ as errors in the buoyancy correction or moisture effects. The work we present here illustrates that these errors are more likely related to viscous forces caused by air currents in the balance weighing chamber arising from a lack of thermal equilibrium between the mass and the surrounding air. This effect is greatly enhanced when objects undergoing calibration have a different surface to mass ratio than that of the mass standards to which they are being compared.

There are very few instances known to the authors where the air in a balance weighing chamber and weights undergoing calibration are in thermal equilibrium with each other. Therefore, the weights are either cooler or warmer than the surrounding air and, furthermore, the air convection currents in the balance chamber impose a drag force on the balance structure and on the weights. A component of this force will either add to the gravitational force acting on the balance or oppose it. In either event there remains an unaccounted force in the calibration algorithm. We report on an experiment which was designed to examine the above hypothesis.

In 1946 Blade² performed a limited study of mass assignment errors caused by convection forces in measurements related to chemistry. Our interest here is to understand the insidious aspects of the effect as it relates to both state-of-the-art and routine mass calibration as performed in modern facilities. To quote Blade "the time variation of the error depends in part upon the manner in which heat divides between two paths, and is therefore a complex function of heat capacity, conductivity, emissivity, and geometry."

¹Indicates references at the end of talk.

Blade's approach was to ask the question "How long must one wait until the mass error for a 17-g plummet does not exceed 0.1 mg?" Today the uncertainty associated with a 1-kg stainless steel mass standard is about 0.1 mg; 0.001 mg for a 1-g weight. In some scientific work the measurement error on a 1-kg platinum standard is just a few parts per billion.

EXPERIMENTAL

We have limited our investigation to temperature differences just a few degrees Celsius either side of the balance temperature which has equilibrated to room temperature. The measurement sequence allows us to look at weight difference between masses that should exhibit a constant difference after the application of a small buoyancy correction. Some of these weights were maintained at temperatures different from that found inside the balance enclosure, some did not have the ideal surface to mass ratio of normal standards, and some were fabricated from materials of different thermal properties. Nominally all the weights were 10 g and their pertinent properties are summarized in Table I.

Table II presents the observation sequence of eight mass comparisons between six weights. The method of double substitution weighing was used to collect the data.

Weights A and B always remained in the balance chamber and all others, except during the intercomparisons, remained outside the balance where they were maintained at temperatures different from inside the balance. Initially, after each sequence the weights outside the balance were elevated in temperature in preparation for the next sequence until a predetermined maximum temperature was reached. The process was then reversed, decreasing the temperature, until a predetermined temperature below that of the balance was achieved and then reversed again until room temperature was once again attained.

All of the weights were inside the balance on several occasions, usually the beginning, the middle, and end of the progression. However, the entire process was repeated twice; the first time stainless steel sheet metal weights designated S and SH were substituted for X and Y (Group I) and the second time copper sheet metal weights C₂ and C₄ were substituted for X and Y (Group II).

The first observation in the sequence was of the two standard weights that always remain in the balance and is indicative of a normal weighing technique. That is, the weights and the air were near thermal equilibrium and the weights had normal laboratory mass standard characteristics. The last measurement in the sequence was a repeat of the first and was merely intended to identify any unusual behavior that could result from introducing the other weights that were not in thermal equilibrium with the balance. The second weighing compares two ordinary laboratory weights of nearly identical properties; however one of them, C, was artificially maintained at a temperature usually different from

















Table 1

MASS ARTIFACT CHARACTERISTICS

IDENTIFICATION	A	B	C	D	GROUP 1		GROUP 2	
					X	Y	X	Y
MASS (g)	10							
SHAPE	CYLINDER HT. \approx DIA.				PARALLELEPIPED			
MATERIAL	STAINLESS STEEL				COPPER			
SURFACE	POLISHED				MILL FINISH			
DENSITY (g/cm ³)	7.89		7.80		8.96			
THERMAL EXPANSION (PPM/ $^{\circ}$ C)	15				17			
SURFACE AREA (cm ²)	6.4		6.0		42.8		46.7	
SURFACE TO MASS RATIO (cm ² /g)	0.64		0.60		4.28		4.67	
ASPECT RATIO	0.86		0.95		3.32		3.64	
CYLINDER DIM. (cm)	1.23 1.05	DIA. HT.	1.19 1.14					
PARALLELEPIPED DIM.(cm)					8.3 2.5 0.06	L W H	9.1 2.5 0.05	

Table 2

SEQUENCE OF MASS DIFFERENCES

	<u>MASS#1</u>		MINUS	<u>MASS#2</u>	
	<u>STORAGE LOCATION</u>			<u>STORAGE LOCATION</u>	
	<u>WEIGHING</u> <u>CHAMBER</u>	<u>HOT/COLD</u> <u>BLOCK</u>		<u>WEIGHING</u> <u>CHAMBER</u>	<u>HOT/COLD</u> <u>BLOCK</u>
<u>OBS.#</u>					
1			—		
2			—		
3			—		
4			—		
5			—		
6			—		
7			—		
8			—		

SHEET METAL WEIGHT ORIENTATION KEY

ON END



ON EDGE



ON FACE

that of the balance. This observation was used to detect any surface-dependent thermal effects that may have been induced, whereas the third weighing looked in particular for any cancellation properties. That is, the weights may not have been in thermal equilibrium with the balance but were equal to each other in temperature and each would presumably have undergone the same offsetting force. This condition would have been undetectable in weighing as the observed difference should remain constant. Weighings 4 through 6 were meant to amplify any surface effects that may exist and to see if there was an orientation dependence. Lastly weighing number 7 looked for cancellation between identical weights with very high surface to mass ratios.

APPARATUS

The equipment used to conduct the measurements consists of a balance, a circulating thermostated bath, and a means to measure temperature, barometric pressure, and relative humidity (see Figure 1). The balance has a capacity of 20 g and a reproducibility of approximately 0.008 mg. A modification made to the balance permits loading a 5-mg sensitivity weight on the balance pan without opening the balance door. This feature causes less disturbance inside the balance weighing chamber and allows for a more rapid progression through the measurement sequence. During the weighing sequence the balance pan was exposed to weights of temperatures quite different from the temperature of the balance. Protection is provided by an insulated aluminum block that also contains a slot for receiving the sheet metal weights (see Figure 2). Fluid is circulated from a thermostated bath to a well-insulated steel mass for thermally soaking the weights at various selected temperatures. The cylindrical weights simply rest on the block whereas additional smaller steel blocks rest on top of the sheet metal weights to insure good thermal contact. This technique has the advantage of rapidly forcing the sheet metal weights back to their initial temperature after a substitution weighing is completed. To measure both the air temperature inside of the balance and that of the soaking block, a calibrated thermistor thermometer with two probes was used. Additional assurance was provided by a mercury-in-glass thermometer. Both devices were accurate to about 0.01 °C.

DATA

Our assumption that weights undergoing calibration are not in thermal equilibrium with the air has been verified in several different laboratories³. The lack of thermal equilibrium comes from several causes. First, mass laboratories are usually not highly-controlled temperature-stabilized spaces. Second, weights have a long thermal time constant in air. Third, if equilibrium exists before the measurement begins, the operator's body heat quickly disrupts this condition. In these measurements, the laboratory temperature fluctuated slowly, about

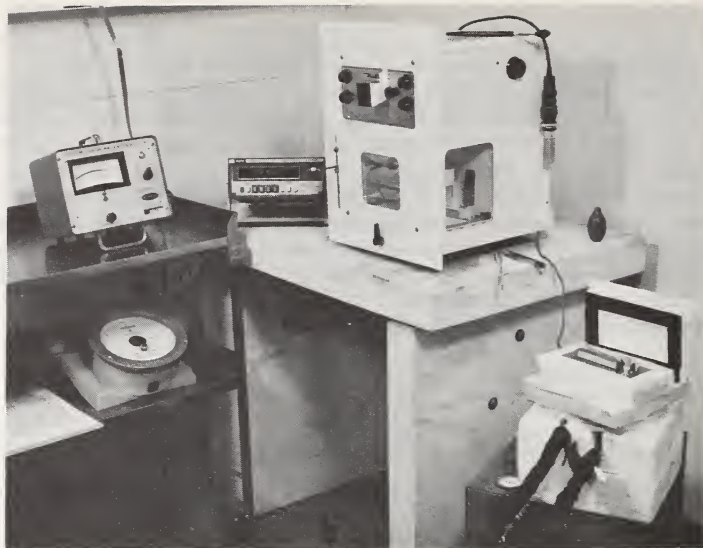


Figure 1: Apparatus Overview



Figure 2: View of weighing chamber with a parallelepiped weight on balance pan.

1 °C per day. The temperature inside the balance enclosure increased about 0.1 °C during the 45-minute measurement period, due to the operator's body heat.

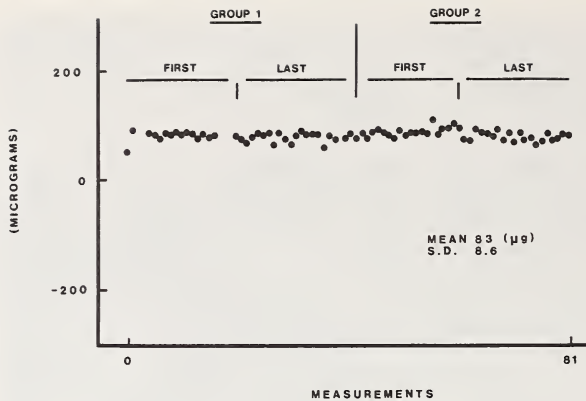
In this study a temperature difference of zero is assigned whenever all the weights were stored inside the balance. These data are plotted in the figures as numbers (except figure 3) to distinguish between thermal soaking in the balance and on the soaking block. A number magnitude greater than one indicates the number of close or overlapping points. The buoyancy correction is based on the air temperature inside the balance as measured by the thermistor thermometer.

Figure 3 presents the measured difference between weights A and B. The reader will recall that the difference (A-B) is observed at the beginning and end of each sequence for a total of 82 measurements; however some measurements were lost resulting in only 76 plotted values. In group 1 there were 36 successful measurements and 40 in group 2. Statistical tests indicate that the first and last sequence measurements of A-B in group 1 are not statistically different; however in group 2 the test does indicate a slight significance. We believe this slight significance is due to the difference in thermal conductivity between the stainless steel and copper weights and does not affect the conclusions of this report.

The third sequence comparison, C-D, is between two identical laboratory weights made of stainless steel. These weights were maintained together outside the balance at temperatures ranging from 5 °C above to 5 °C below the balance temperature as were all weights outside the balance. Figure 4 presents the data graphically. The group 1 average difference was -19.8 μ g and in group 2, -16.4 μ g; the standard deviations were 6.7 and 10.2 μ g, respectively; the pooled values are given in figure 4. If we compare these results to the second measurement in the sequence, A-C, figure 5, we see that the difference, C-D, is constant whereas A-C is not. We conclude that there is a very important cancellation property demonstrated by these results. That is, the viscous forces acting on each weight are the same and do not affect the measured differences.

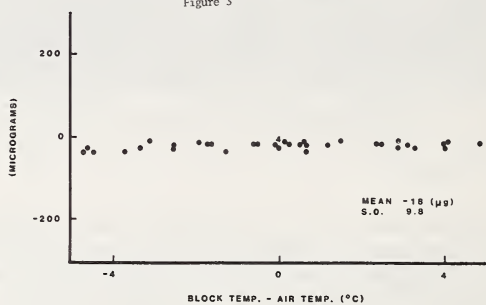
Again looking at the second sequence observation (A-C), as shown in figure 5, we see evidence that the observed difference has a strong temperature dependence. The reader will recall that weight A, although nearly identical to weight C, always remains inside the balance whereas C is heated or cooled prior to the comparison. The line drawn through the data of figure 5 is not the result of a least-squares fit but is suggested by the data. The data given in all the figures are treated in the same way.

Looking next to observation 7 in the sequence where sheet metal weights of large surface-to-mass ratios were compared while supported on end, to present a high aspect ratio, the cancellation property is again present, figures 6 and 7. However, both in group 1 and group 2 the data have a greater scatter as measured by the standard deviations, 36.4 and 32.0 g, respectively. We conclude that weights with high surface-to-mass ratio



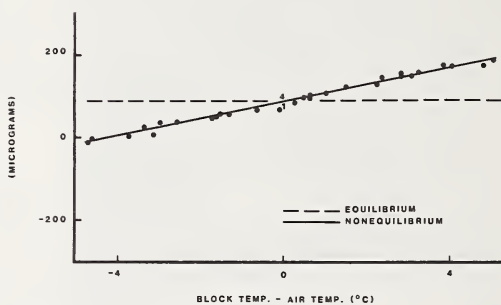
A-B ALL MEASUREMENTS

Figure 3



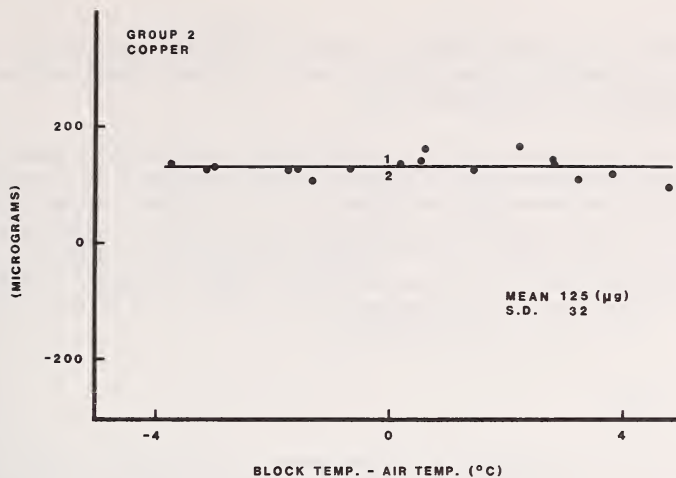
C-D ALL MEASUREMENTS

Figure 4



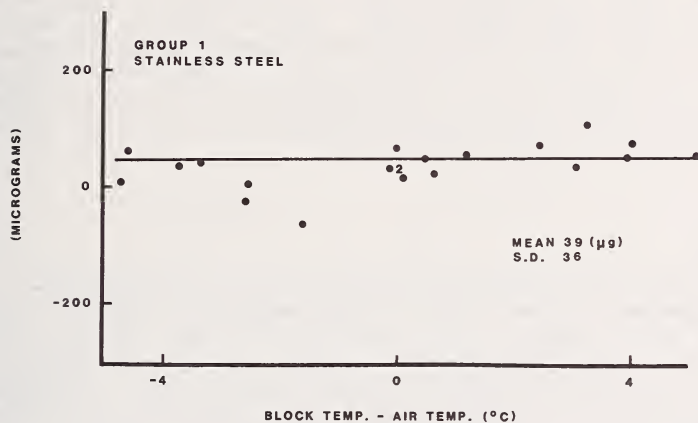
A-C ALL MEASUREMENTS

Figure 5



X-Y ON END

Figure 7



X-Y ON END

Figure 6

are very sensitive to much smaller thermal inequalities, with differences in thermal properties between stainless steel and copper having little effect on the outcome.

Observations 4 through 6 of the sequence were designed to demonstrate whether or not the observed difference between weights of dissimilar surface-to-mass ratios might be dependent not only on temperature but also on their orientation on the balance pan as well. Figures 8 through 13 show clearly the effect to be orientation sensitive and with about the same magnitude for stainless steel and copper weights of the same dimensions. All of the A-X orientations are shown in figures 14 and 15 for group 1 and group 2 respectively.

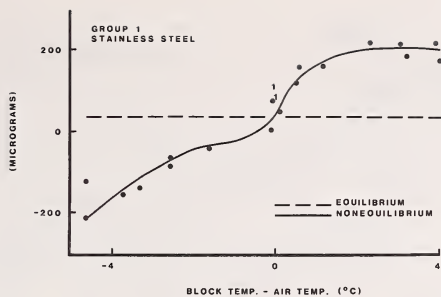
MEASUREMENT ERROR

Beyond the errors attributed to measurement imprecision, about 8 μg here, there are several errors in the buoyancy correction to be considered. First there is an error associated with the air density equation itself that in this work is trivial. Second, when two masses of nominally equal density are compared but one is 5 °C warmer than the other, the respective buoyant forces are different by 25 μg assuming the air takes on the weight temperature. Thus our data of the mass differences near thermal equilibrium are unaffected but progressively approach a 25- μg systematic error near the 5 °C extremes. Therefore, this error has little effect on the observed trends and is almost non-existent in the areas approaching equilibrium that are of the greatest interest to metrology.

DISCUSSION

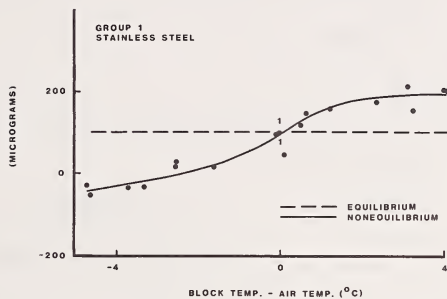
The data here clearly demonstrate that there is a significant surface-dependent thermal effect present under the condition of this experiment and we suggest that these results reflect similar conditions encountered in many laboratories. However, the thermal effect is complex and varies with balance, weight geometry, etc.; therefore, these results should not be used to predict the exact behavior for other cases. The effects of these thermal effects are of concern and safeguards should be established to minimize the errors they cause.

Briefly we can summarize these measurement results as follows: There is a cancellation property for weights of minimized surface-to-mass ratio that are equal in temperature. The cancellation property still exists for the non-idealized weights with significant degradation in precision. A non-cancelling effect is present whenever weights are not equal to each other in geometry, orientation, and temperature, leading to a systematic error in the measured difference.



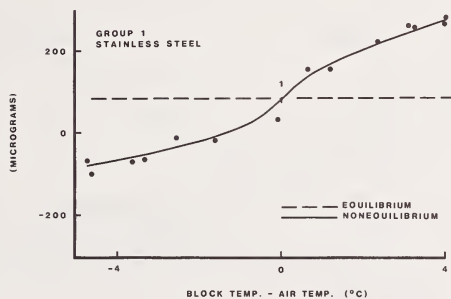
A-X ON END

Figure 8



A-X ON EDGE

Figure 9



A-X ON FACE

Figure 10

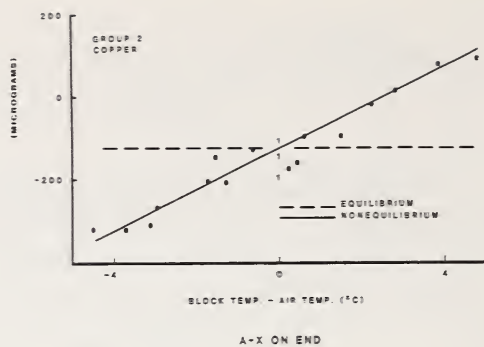


Figure 10

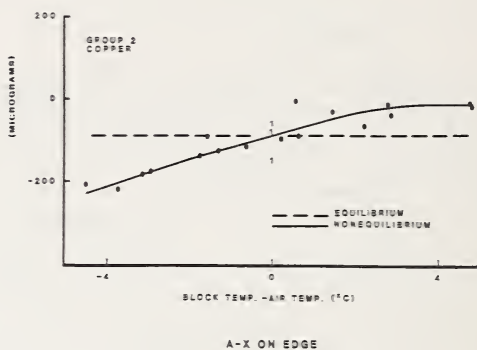


Figure 11

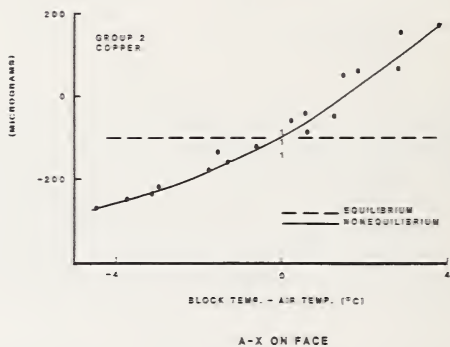
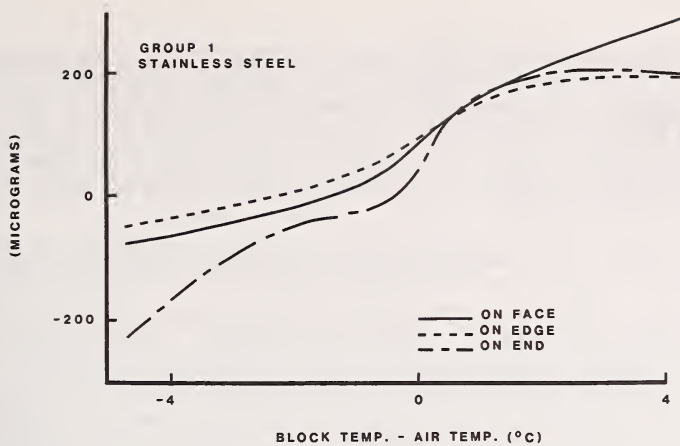
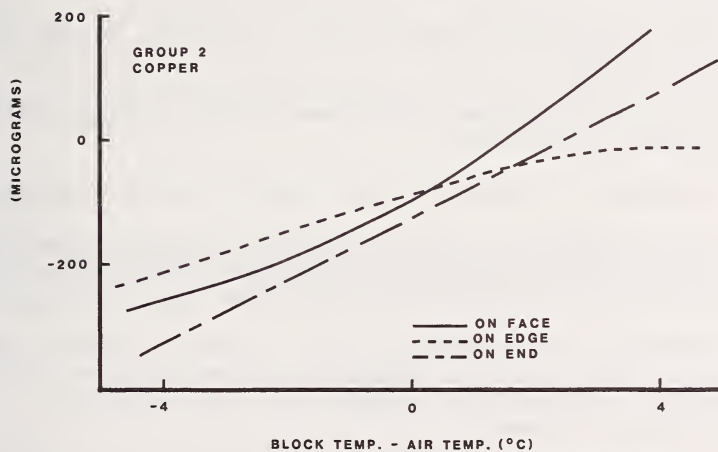


Figure 12



A-X ALL ORIENTATIONS

Figure 14



A-X ALL ORIENTATIONS

Figure 15

To better understand the significance of these results we measured the temperature change versus time for a few typical laboratory weights and field standards. This was accomplished by heating and cooling the weights and then recording both temperature and time until room temperature was attained. The details of this work are summarized in the appendix to this report but we use a few calculated equilibrium times in this discussion.

To understand how a systematic error of this sort can be introduced into the measurement system and remain undetected we will examine the NBS mass calibration program, a procedure which has been duplicated by many other laboratories in both equipment and method. The program primarily is used to calibrate ordered sets of laboratory mass standards. These weights are usually made of rhodium plated brass or polished stainless steel and their surface area has been minimized; that is, they are in the form of a right circular cylinder whose diameter and height are equal. The densities of these weights are between 7.3 and $8.4 \text{ g}\cdot\text{cm}^{-3}$.

The calibration process usually begins with the intercomparison of the mass standard, a check standard, and a combination of weights taken from the set undergoing calibration, called a summation. The performance history for the mass standards and balances from previous calibrations is used as a guide to determine the validity of these measurements. If the current calibration does not yield values close to the accepted values the calibration is flagged "out of control" and repeated. When repetition is necessary it is usually because of misreadings, wrong weight combination, and sometimes for unknown reasons.

Looking closer at the process and with our new insight, we make the following observations:

- 1) The check standard and weight summation have vastly different surface-to-mass ratios.
- 2) A summation of weights is never used as a check standard.
- 3) Weights undergoing calibration cannot always be stored in the weighing chamber during calibration and therefore may not be in thermal equilibrium with mass standards.
- 4) Occasionally the process is used to calibrate weights with extraordinary features; that is, aluminum kilograms, silicon crystals, pressure-gage weights, and other objects of scientific interest.
- 5) The room temperature is not tightly controlled and the balance operator has an immediate influence on the temperature inside the balance case.

We know that if we should repeat an "acceptable measurement" we are likely to get the same result. However in the case of the weight summation, aluminum kilogram, and other masses of different

characteristics our results probably contain the systematic error and repetition under the same conditions will always yield the same undetected error. Errors of the sort we have been concerned with here usually remain undetected and unaccounted for in the uncertainty statements. The few occasions that are indicative of the thermal problem have occurred when an interlaboratory comparison takes place or some procedural rule has been violated. If one laboratory has very good thermal control relative to another we sometimes encounter anomalous results that we now have the basis to understand.

In conclusion we can see the need for automation where the highest levels of accuracy are required. This would remove the operator influence and in conjunction with good thermal control should give bias-free results. Routine calibration methods might include better thermal control, check standards designed to look for systematic effects, improved weight storage, and sufficient equilibrium times. A stainless steel 1-kg weight removed from a vapor degreaser at 65 °C requires 14 hours to be within 0.01 °C of the room temperature. If after equilibration, the weight is placed in a balance 1 °C cooler an additional 7 hours of soaking is required. For additional details on required equilibrium times see the appendix of the report.

From both a practical and economic point of view we should consider techniques that can readily be implemented in the laboratory with an immediate improvement to mass measurement. Some suggestions are as follows: Balance weighing stations can be protected with heat shields and insulation around the balance from the influences of changing room temperature and the operator's body heat. The operator can be stationed away from the balance and wear insulating gloves when handling the weights. Balance weighing chambers can be annexed to accommodate all the weights in a given sequence to provide uniform thermal soaking. Lastly, do not omit or shorten the required soaking period.

ACKNOWLEDGMENT

The authors are indebted to Charles P. Reeve of the Statistical Engineering Division for his generous assistance in analyzing the thermal equilibrium data.

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APPENDIX

The time required for a mass to reach thermal equilibrium with its surroundings depends on the initial temperature offset (T_I), geometry, surface finish, thermal capacity, and thermal conductivity. The difference in temperature between the mass and the ambient laboratory temperature, T_R , as a function of time, t , is given approximately by the following equation:

$$T_I - T_R = Ae^{-t/B_m} \quad (1)$$

where B_m is a combination of several physical constants for the mass M , and the coefficient A is equivalent to the initial thermal offset.

By experiment we found that the constant B_m was a function of weight design and material and of whether the weight was warmer or cooler than the laboratory temperature. These families of curves are the result of heating or cooling various mass standards and then allowing them to equilibrate to the laboratory temperature while continuously recording time and temperature; Figure A1 is a typical data plot showing the cooling of weights which were supported on the laboratory floor by an insulating pad.

The data from each curve were fitted by the method of least squares and the resulting values of B_m for each family were again fitted to the following equation:

$$B_m = KM^P \quad (2)$$

where the values of K and P are derived from several different masses.

The results for P and K are grouped in table A1 according to weight type and thermal state (i.e. hot or cold) as compared to the laboratory temperature.

The waiting time, or time required to reach an approximate equilibrium, can then be calculated by making the proper substitutions from table A1 into the formula

$$\text{Waiting time} = K M^P \ln \left(\frac{T_I - T_R}{T_F - T_R} \right)$$

where T_F is the room temperature plus a small temperature offset that as a practical matter can be between 0.01 °C and 1 °C. $T_F - T_R$ which must not equal zero, is the greatest acceptable temperature differential.

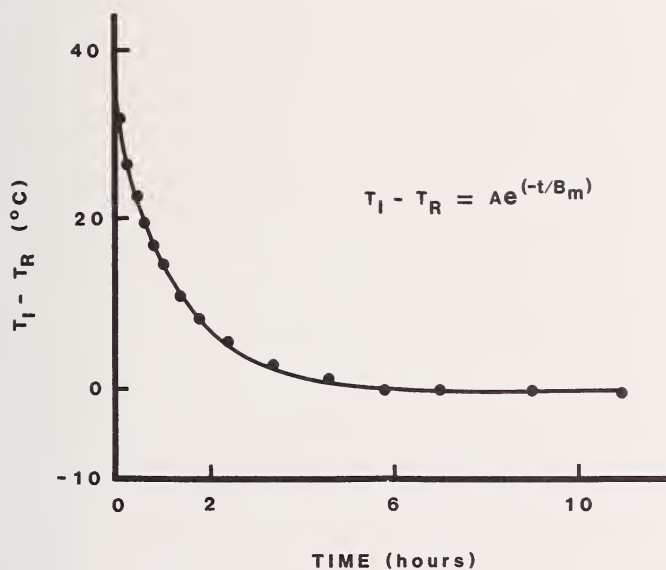


Figure A1: The above data are taken from continuous recording of thermal decay for a 1 kg stainless steel weight and are typical of other weight decay data.

To illustrate the calculation assume that a 1-kg stainless steel mass standard is heated to 65 °C in a vapor degreasing cleaning tank. The weight is removed from the degreaser and allowed to equilibrate to a 0.01 °C offset (20.01 °C) in the laboratory that is at 20 °C. We then can make the following substitutions from table I into the above formula:

$$\text{Waiting time} = 1.611(1)^{.365} \ln \left(\frac{65-20}{20.01-20.00} \right) = 13.6 \text{ hours.}$$

The mass must be expressed in kilograms, temperature in °C, and the result is in hours.

TABLE A1

<u>Weight Type</u>	<u>Thermal State</u>	<u>K</u>	<u>P</u>	<u>Range of Use</u>
Stainless steel cylinders. Ht. \approx dia. with polished surface	Hot	1.611	0.365	1 kg to 250 kg
	Cold	1.668	0.401	1 kg to 23 kg
Cast iron cubic with painted surfaces	Hot	0.628	0.454	1 kg to 450 kg
	Cold	0.934	0.367	1 kg to 23 kg
Brass cylinders Ht. \approx dia.	Hot	1.098	0.349	1 kg to 23 kg
bare metal finish	Cold	1.379	0.408	1 kg to 23 kg

LIQUID METER PROVERS

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Abstract

The following discussion has been prepared to acquaint the reader with the various types of liquid meter provers available in today's market. Particular emphasis is given to the most current calibration technology, the compact, small volume, portable prover. This compact prover provides high accuracy, repeatability, and rapid operation in a minimum of space without interrupting the flowing stream.

Introduction

The advent of the energy crisis and strict EPA regulations began a drastic change in the philosophy of flow measurement. Previous to this time petroleum products were relatively inexpensive. Therefore, demands for high measurement accuracy were of lesser concern.

The energy crisis of 1973 started an era of intense awareness of accuracy, accountability and profitability.

Spiralling inflation during 1978 and 1979, brought on by the rising cost of imported crude, was the major factor that made the oil companies look, with a critical eye, at their operations. One of the ways major oil companies could keep ahead of this skyrocketing inflation was to modernize their operations with accuracy, accountability and profitability as their goal. Accuracy became important because the price of imported crude had increased ten-fold over the last ten years. This means that 1% accuracy in a meter ten years ago would today have to be .1% to maintain the same cost/accuracy ratio. This also applies to accountability where the tracking of products would have to be again 10 times as accurate to maintain the status quo. Profitability would follow the same rule, with added factors such as transportation, marketing cost, taxes and other influencing factors which drive the end result up exponentially.

As a result, in recognition of the tremendous problem facing the oil companies, major manufacturers of liquid flow measurement devices and accessories have dedicated their expertise to supplying the measurement accuracies required. With emphasis on meters being more accurate than they were 10 years ago, it follows that there would be equal emphasis for better methods of calibrating the meter once it has been put into service. Today's standards are:

1. Master Meter Prover.
2. Volumetric Seraphin or Can type prover.
3. Pipe provers.
4. Weight Scale provers.
5. Small Volume provers.

Types of Meter Provers

Many factors will affect meter operation. It is therefore necessary to have some means of determining the meter performance under the actual operating conditions. The meter performance, or accuracy, is the ratio of the indicated volume to the actual true volume. The actual volume is determined by the use of one of several types of meter calibration (prover) systems which are as follows:

1. Gravimetric proving by use of a weigh scale (Figure 1).

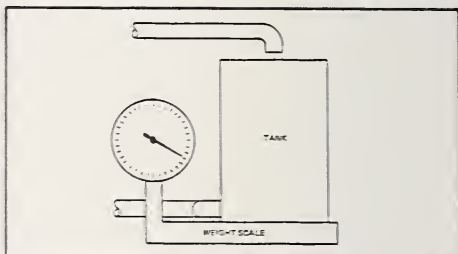


Figure 1 Weight Scale Prover

2. Volumetric proving using a calibrated seraphin tank (Figure 2).

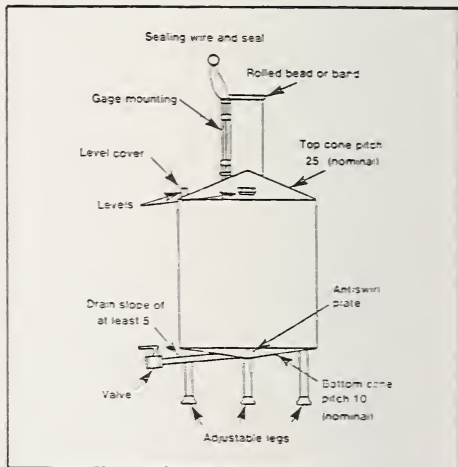


Figure 2 Field Standard Prover

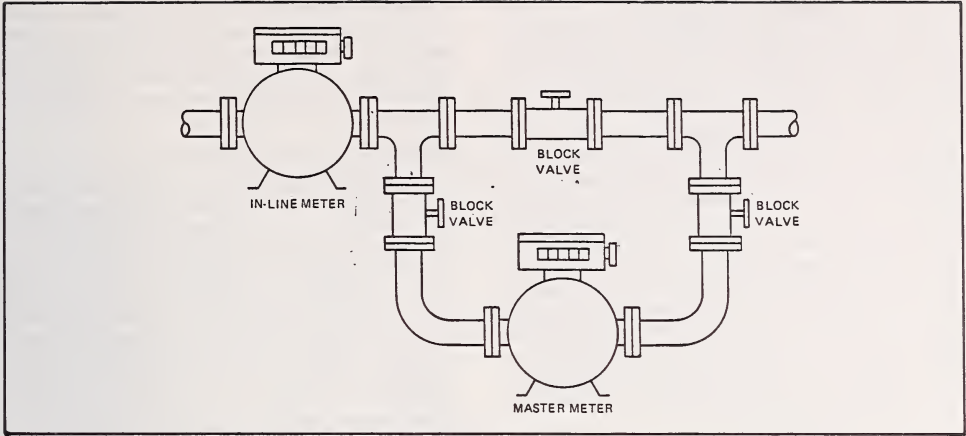


Figure 3 Master Meter Prover

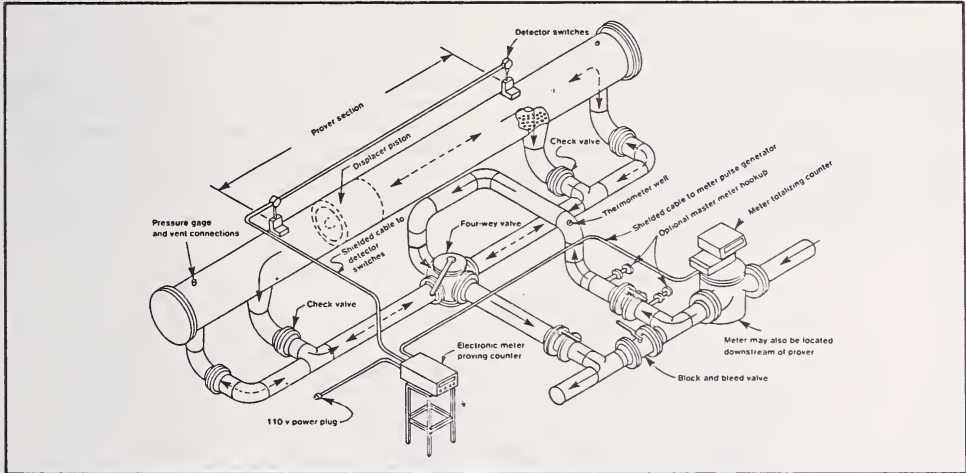


Figure 4 Piston Prover System

3. Master meter proving by using a standard meter as a reference for testing other working meters (Figure 3).
4. Volumetric proving using a positive displacement type prover (Figure 4).
5. Compact (small volume) Prover using a poppet valve actuated piston (Figure 5).

All of the above mentioned proving systems have varying degrees of accuracy because of their principle of operation, product characteristics, flow rate, pressure and the meter application.

Of the prover systems mentioned above, the positive displacement type is by far the most accurate and convenient to use. The main advantage of the positive displacement meter proving concept is that the flow of liquid through the meter-

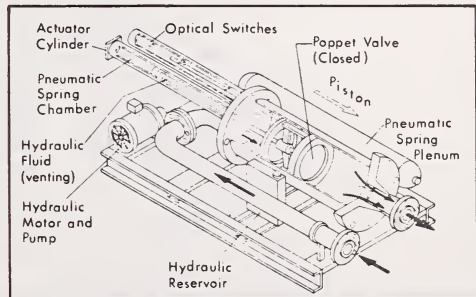


Figure 5 Compact Prover

ing system, whether in the proving mode or not, is continuous. This continuous flow eliminates errors from the starting and stopping of the product flow, which is one of the requirements of a volumetric system. Also proving time is substantially reduced and temperature stability of the prover and meter is more easily achieved.

There are numerous types of positive displacement meter provers on the market today, but they all operate on the same basic principle, that being the displacement of a known volume of product. This displacement of product occurs through the use of a displacer, either spheroid or piston, which forces the product through a very precisely calibrated section of pipe, commonly referred to as the measuring section. Since the product flowing through the prover is also the product that passes through the meter in question, a ratio can be established between the registered volume and the actual volume of the calibrated section in the prover. This ratio is referred to as the meter factor, and is a multiplier that is applied to the meter registration to determine the true volume of the product meter.

$$\text{Meter Factor} = \frac{\text{Prover Volume}}{\text{Meter Volume}}$$

There are three basic types of positive displacement meter provers; unidirectional, bidirectional, and compact (small volume) provers.

Unidirectional Provers (Reference Figure 6)

This type prover uses a spheroid, or piston, which makes a single one-way trip through the prover loop and the measuring section. The measuring section's limits are defined by a set

of detector switches that have to be precisely located to define the calibration section. As the sphere, or piston, passes these limit switches, the calibration begins. Since product flow in the unidirectional prover is always in one direction, higher velocities of the spheroid, or piston, can be achieved.

Bidirectional Provers (Reference Figure 7)

This type of prover uses a spheroid, or piston which traverses the total length of the prover pipe, and returns back through that same pipe by means of a four-way diverter valve. It is because of this two-way direction of the spheroid that the name bidirectional is derived. The bidirectional prover is available in sizes to 48" in diameter with pressure rating of 600 lb ANSI. As in the case of the unidirectional prover, the calibrated section of the prover is again defined by detector switches. However, since the spheroid makes a two-way trip through the same pipe, the positioning of the detector switches is not as critical as in the unidirectional prover case, since the round trip will tend to cancel out positioning errors of the detector switch.

There is another form of the bidirectional prover which uses a piston as a displacer. The operation of this prover is similar to that discussed above under bidirectional provers. The difference obviously being that the displacer is a piston instead of spheroid. One of the advantages of the piston type bidirectional prover is that it does not require a ball-launch chamber that is larger than the measuring section. However, it does require a length of pipe at each end in which the piston rests between proving cycles.

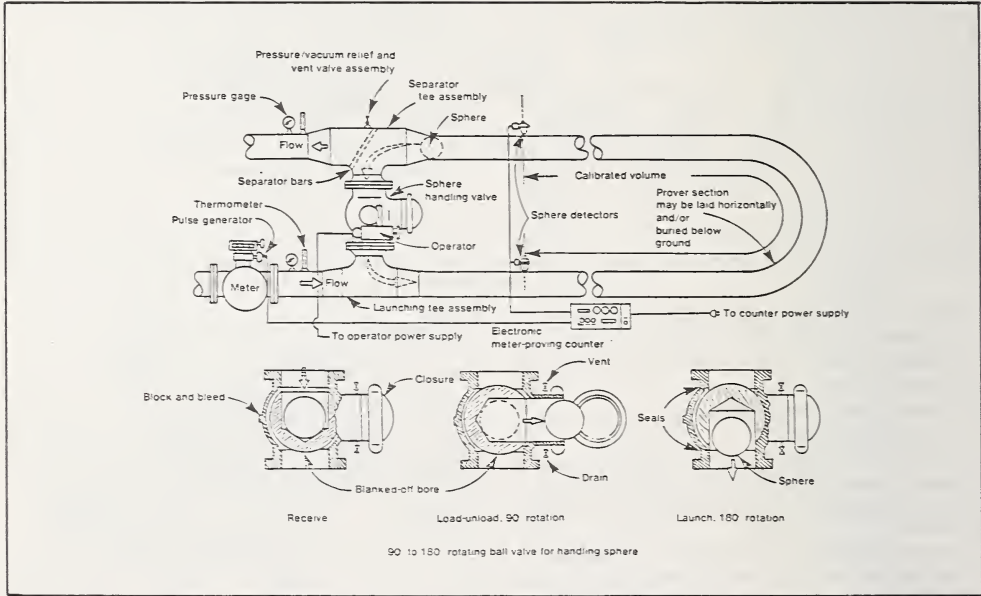


Figure 6 Typical Unidirectional Return-Type Prover System

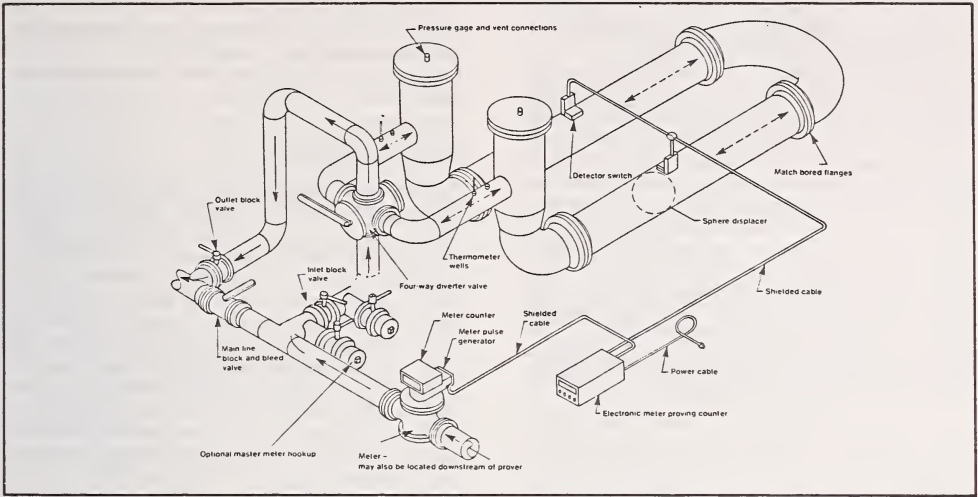


Figure 7 Typical Bidirectional U-Type Sphere Meter Prover

Compact, Small Volume, Provers (Reference Figure 8)

This compact prover is a passive device which serves as a primary standard in the accurate determination of volume through a transducer (measuring device) under test. Operation is fully automatic requiring the operator to initiate the run only, with all subsequent actions automatically accomplished.

Its inherent design represents a departure from the conventional technology used in laboratory weight-time calibrators or volume calibrators today.

Design features include a piston assembly with an internal poppet valve in conjunction with optical position sensing, hydraulic and/or pneumatic piston actuation and modern data processing techniques. The result is a complete pack-

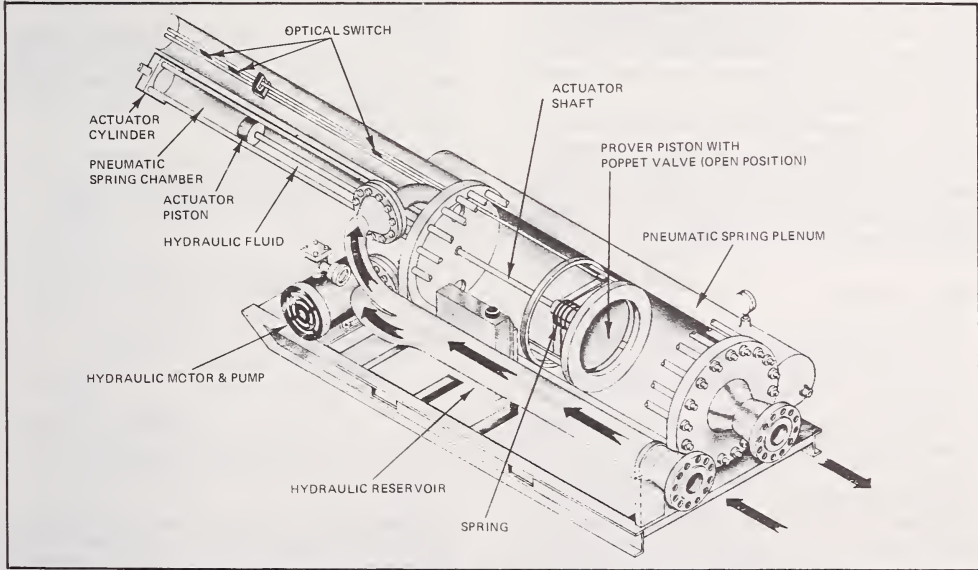


Figure 8 Compact (Small Volume) Prover

aged proving system significantly reduced in size, weight, and cost while equalling or exceeding the performance of conventional provers and laboratory calibrators.

Unique electronics permit exact time determination and pulse counting, providing high accuracy proving with smaller volume and fewer flowmeter pulses than any previous technology. The use of a small displacement volume is made possible by the high resolution of the compact prover which is attributed to three major factors: precision optical switches, data acquisition using double chronometry, and adjustable multi-pass runs. Optical switches are used for defining prover volume by detecting the piston position. These switches are reliable, precise and have a fast response time (5×10^{-6} sec). Data acquisition using double chronometry (having two electrical response systems) allows a much higher degree of resolution of meter pulses than the plus or minus pulse common to conventional loop provers. Multi-pass runs are adjustable, allowing for an increased number of meter pulses representing an increased measured volume.

A compact microprocessor data control console can be located adjacent to, or remotely from, the prover and is suitable for either portable or panel mounting. It automatically cycles the prover to the desired number of passes, and processes and displays the data (Average Meter Frequency, Flow Rate in Engineering Units, K Factor and Total Meter pulses per run). Raw data can be displayed by depressing the Display Switch one time. A second depression of the display switch will result in the call back of the calculated data.

The microprocessor data control and data reduction system offers considerable flexibility. Functions can be provided on a user selected basis, such as an interface output for hard copy printout of raw and processed data, or for connection to another computer. The effects of temperature and pressure on a displaced volume of liquid is an important factor when performing a volume calibration (water draw) as well as proving a flowmeter. The data control automatically corrects for pressure and temperature.

The unique features of this prover, as described, are a viable concept for cost reduction and increased versatility in calibration systems. The relatively small size has proved to be an added benefit in congested areas such as metrology laboratories, off-shore platforms, chemical plants, instrument calibration/repair facilities, and pipelines.

Design Features

- . Compact and Portable - Entire unit may be mounted to a skid or trailer for easy access and mobility.
- . Rapid Proving Operation - Single pass calculation and display in seconds.
- . Versatility - Operates with virtually any pulse output flowmeter (Turbine, PD, Vortex Shedding, Helical, Magnetic, etc.).
- . Positive Leak Checking.
- . Automatic Mechanical Over-ride insures undisturbed product flow.
- . Corrosion Resistant - Standard flow tube is plated with electroless nickel (Series 300 Stainless Steel optional).

- . Repeatability - .02% or better.
- . Hazardous Location - Prover meets National Electrical Code Class 1, Group D, Division 1 specifications.
- . Toxic Fluids - Closed system allows users of volatile or toxic fluids.

Principle of Operation

The hydraulically operated Compact Prover and its component parts are shown in Figure 8. Basically the prover consists of a flow tube in which is mounted a free piston with a coaxially mounted poppet valve. The poppet valve is contained within the prover piston and is connected via the actuator shaft to the piston of the actuator cylinder. A pressure in the pneumatic spring plenum, in combination with the hydraulic system, operates the actuator piston. The pressure in the pneumatic spring plenum serves to close the poppet valve and operate the piston through a proving run. The hydraulic system returns the piston upstream and holds the poppet valve open in the upstream position. The normal flow of the fluid will pass through the open valve. A fail safe stop is provided at the downstream flange to prevent accidental blockage of fluid flow.

The piston position in the cylinder is detected by optical switches. A signal is generated when a "flag", which is attached to the shaft and moves in synchronization with the prover piston, passes through the slotted switch blocking the passage of light. Three switches are used: one for sensing the upstream position of the piston assembly and two for defining the displaced volume of the proving system. These signals are used to operate various timers and counters to obtain data, to operate the appropriate valves and controls, and to illuminate the appropriate displays on the data control console.

The prover is in its start, pre-run, mode when the calibration piston is in the upstream position with its poppet valve open. The STANDBY mode is achieved and maintained by applying hydraulic pressure to the downstream face of the actuator piston. (See Figure 9).

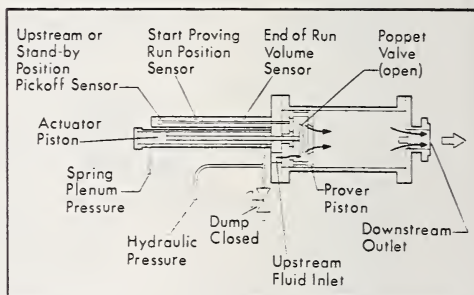


Figure 9 Compact Prover Standby Mode

Initiating a START command through the data control console causes hydraulic pressure to be vented from the downstream face of the actuator piston. Proper gas pressure from the pneumatic spring plenum applied to the upstream

face of the actuator piston overcomes seal bearing friction and the ejecting force applied to the shaft, allowing the poppet valve to close. The closed piston assembly will move with the continuous stream of fluid through the prover. The effect is to increase the measured fluid downstream pressure by a very slight amount (usually only a few inches of water). This assures that the poppet valve is closed during a proving pass (see Figure 10). As the piston assembly moves downstream, the "flag" passes through the first switch generating a pulse then through the second switch generating a second pulse.

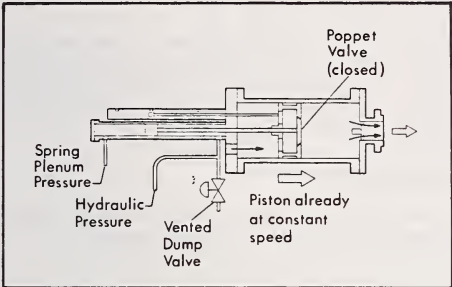


Figure 10 Compact Prover Starting Mode

As soon as the "flag" passes the End of Run volume switch, all data acquisition is complete (Figure 11). The console causes hydraulic pressure to be applied to the downstream face of the actuator piston overcoming the pressure in the pneumatic spring plenum. The applied pressure repositions the prover piston through the flowing fluid to the upstream of the flow tube while keeping the poppet valve open. This action also causes the gas in the pneumatic spring system to be recompressed.

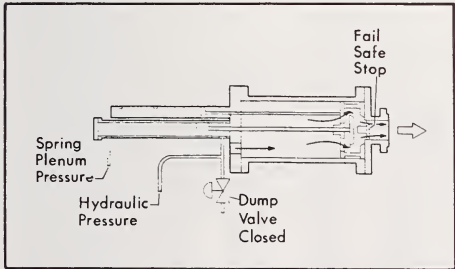


Figure 11 Compact Prover End-of-Run

Double Chronometry (Referenced Figure 12)

As the piston (displacing device) passes the first detector (P1), which defines the beginning of the calibrated volume, it starts a counter in the electronic console. This device counts the output of a 100 KHz oscillator; i.e., it counts .000001 second time increments. At the same time it enables another counter which also counts the output of the 100 KHz oscillator. This counter is started by the first whole flowmeter

pulse after the first counter is started. When the displacing device reaches the second detector (P2), which defines the end of the calibrated volume, it stops the first counter. The elapsed time, which will be called Time A, is the time required to displace the calibrated volume D of the prover. At the same time that the second detector stops the Time A counter it sets a gate to stop the other counter which has continued running. This counter is stopped when the next whole flowmeter pulse is counted. This is the time required to count the total number of whole flowmeter pulses C, and is identified as Time B.

Using this data it is possible to obtain an accurate pulse count in whole numbers for the period (Time A) during which the calibrated volume (D) was displaced. There were $A \times C/B$ pulses, where C/B can be seen to be the average frequency of pulses generated during the time required to displace Volume D. Time A is the precise time elapsed. Accordingly, the K-factor corresponding to this period of time is seen to be:

$$K = \frac{A}{D} \times \frac{C}{B}$$

Very simply stated it is the average flowmeter frequency times the time required to displace the calibrated volume.

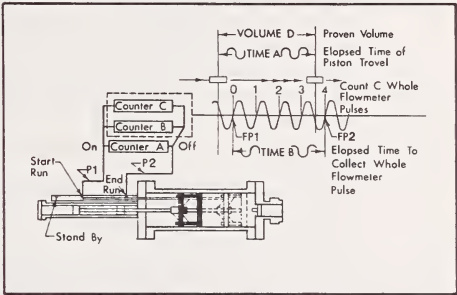


Figure 12 Double Chronometry

Figure 12 shows that the time periods for displacing the calibrated volume of fluid and for counting whole flowmeter pulses are coincident except for a fraction of one pulse. Therefore, C/B represents the average frequency of flowmeter pulses during the time of the displacement of the calibrated volume.

Double Chronometry

K Factor Calculation for a 12" Compact Prover

$$K = \frac{A(\text{Time})}{D(\text{Volume})} \times \frac{C(\text{Pulses})}{B(\text{Time for Pulses})}$$

Reference:

A = Time for Known Displaced Volume in Seconds

Time Counter - 100 KHz
000.58377

B = Time for Whole Meter Pulses

Time Counter - 100 KHz
000.58329

C = Accumulated Whole Meter Pulses
Pulse Counter (From Meter)

0 0 0 0 0 3 6 4

D = Known Displaced Volume (By Water Draw Certification)
14.99988 Gal (.35714 BBL)

Example:

$$K = \frac{A(\text{Time})}{D(\text{Volume})} \times \frac{C(\text{Pulses})}{B(\text{Time for Pulses})}$$

Where:

$$K = \frac{0.58377}{0.35714 \text{ BBL}} \times \frac{364}{0.58329 \text{ (Referenced Above)}}$$

$$K = 1020.0468 \text{ Pulses Per BBL (Or Unit of Volume)}$$

Test Results

The following test:(Table 1) is a sample result of a typical Turbine Flowmeter calibration run. An explanation of the column headings is as follows:

- FREQ Frequency output of the flowmeter under test.
- F RATE Instantaneous flowrate during proving.
- K Individual K-factor (pulses per unit volume) of the flowmeter for a particular pass.
- T DVOL Time in seconds for the calibrated displaced volume.
- T FMP Time in seconds for the whole number of pulses from flowmeter.
- NO. PUL Number of whole pulses accumulated during proving passes.
- K AVE Average K-factor (pulses per unit volume) of all previous passes in that run.
- P NO. Number of passes.

NOTE: The measured volume is set into the microprocessor and is not indicated above. It was 15.066276 gallons and was determined by water draw and traceable to NBS.

The repeatability of the test results with the 3" turbine meter (Table 1) is as follows:

- Runs 1 & 2 - 0.0072%
- Runs 2 & 3 - 0.0082% - worst case
- Runs 3 & 4 - 0.0034% - best case

The total time required to complete all proving runs and print out the data was under 3 minutes.

The repeatability of the test results with a 4" Positive Displacement Meter (Table 2) was one count difference in over 100,000 count or 0.0001%.

It is easy to see that the repeatability and accuracy of these tests far exceed the published data on existing calibration systems. The dual chronometry technique and optical sensors have greatly improved the performance of liquid flowmeter calibration systems.

Comparison

Table 3 outlines the salient characteristics of the Compact Prover, Ball Prover and the Weight-time Calibrator.

Conclusion

The Compact Prover is a newcomer to the prover market-place. It is a piston type prover. It has great advantages in size, accuracy and economy. The compact prover was introduced in about 1976 and has become an accepted measurement standard in the industry today.

Advancements in the realm of micro-processor technology has allowed the size of the prover volume to be reduced with accuracies equal to or greater than those of the older designs.

Table 1 3" Turbine Meter

TEMPERATURE 71°F							
FREQ	F RATE	K	T DVOL	T FMP	NO. PUL	K AVE	P NO.
472.53	568.7	49.8506	01.58745	01.58719	00750	49.8506	01
471.84	567.9	49.8512	01.58978	01.58950	00750	49.8509	02
472.88	569.1	49.8494	01.58623	01.58601	00750	49.8504	03
472.11	568.2	49.8478	01.58877	01.58860	00750	49.8497	04
472.93	569.1	49.8538	01.58621	01.58585	00750	49.8505	05
473.67	570.0	49.8538	01.58373	01.58337	00750	49.8538	01
471.78	567.8	49.8515	01.58999	01.58970	00750	49.8527	02
474.99	571.6	49.8544	01.57934	01.57896	00750	49.8533	03
472.29	568.3	49.8578	01.58848	01.58799	00750	49.8544	04
473.82	570.2	49.8532	01.58320	01.58286	00750	49.8541	05
474.46	570.9	49.8572	01.58121	01.58285	00751	49.8572	01
474.08	570.6	49.8440	01.58206	01.58201	00750	49.8506	02
474.81	571.5	49.8484	01.57976	01.57957	00750	49.8499	03
474.88	571.5	49.8516	01.57962	01.57933	00750	49.8503	04
474.83	571.5	49.8488	01.57971	01.57951	00750	49.8500	05
474.04	570.5	49.8519	01.58243	01.58213	00750	49.8519	01
473.83	570.2	49.8528	01.58316	01.58283	00750	49.8524	02
475.96	572.8	49.8510	01.57602	01.57575	00750	49.8519	03
473.85	570.3	49.8475	01.58293	01.58277	00750	49.8508	04
474.32	570.8	49.8551	01.58160	01.58120	00750	49.8517	05

Typical Printout (Four 5 Pass Runs - Turbine Meter)

Table 2 4" Positive Displacement Meter

TEMPERATURE 71°F

FREQ	F RATE	K	T DVOL	T FMP	NO. PUL	K AVE	P NO.
955.04	573.7	99.8710	01.57353	01.57374	01503	99.8710	01
959.84	575.4	100.071	01.56882	01.56901	01506	99.9713	02
958.09	574.6	100.029	01.57102	01.57083	01505	99.9906	03
957.18	574.5	99.9565	01.57137	01.57128	01504	99.9821	04
956.68	574.4	99.9253	01.57169	01.57209	01504	99.9707	05
958.48	574.2	100.145	01.57219	01.57227	01507	99.9998	06
958.27	574.3	100.111	01.57201	01.57158	01506	100.015	07
957.12	573.3	100.155	01.57460	01.57451	01507	100.033	08
956.66	572.8	100.196	01.57600	01.57527	01507	100.051	09
959.60	574.7	100.173	01.57080	01.57044	01507	100.063	10
958.18	574.2	100.114	01.57221	01.57277	01507	100.114	01
961.29	575.3	100.247	01.56920	01.56872	01508	100.180	02
961.07	575.2	100.243	01.56950	01.56908	01508	100.201	03
958.35	573.4	100.269	01.57436	01.57458	01509	100.218	04
958.98	574.4	100.158	01.57157	01.57249	01508	100.206	05
957.46	574.8	99.9419	01.57067	01.57081	01504	100.162	06
957.68	575.0	99.9301	01.57013	01.56941	01503	100.129	07
954.84	573.2	99.9324	01.57483	01.57512	01504	100.104	08
955.07	573.1	99.9855	01.57529	01.57579	01505	100.091	09
958.44	576.2	99.8004	01.56685	01.56608	01501	100.062	10

Typical Printout (Two 10 Pass Runs - Positive Displacement Meter)

Table 3 Prover Comparison

	Compact Prover (1000 GPM)	Conventional Ball Prover (1000 GPM)	Conventional Weigh-Time (150,000 PPH)
Size	8' L x 4' W x 3' H	18' L x 8' W x 11-1/2' H	5' L x 10' W x 8' H
Speed of Operation	0.4 Sec at max. flowrate	1 min at max. flowrate	10 seconds per run
Data Reduction	Can be in terms of K-factor or meter factor	K-factor or meter factor	K-factor only
Printout of Calculated Data	Optional features	Optional features	Not available
Weight	Less than 3000 lb	15,000 lb	7,000 lb
Mobility	Unlimited by size and weight	Limited by size and weight	Must be leveled and in permanent location
Pressure Rating	Std. 600 lb ANSI Can be 1500 lb ANSI rated at 3600 psig (24,804 kPa)	Restricted to 600 lb ANSI rated at 1400 psig (9925 kPa)	Maximum pressure 125 psig (861 kPa)
Toxic Fluids	Yes, closed system	Yes, closed system	No, open system
Rangeability	1000:1 turndown	200:1 turndown	300:1
Viscosity Range	Up to 5,000 centistoke	Up to 500 centistoke	Up to 30 centistoke
Temperature Range	Up to 400°F (204°C)	200°F (93°C)	180°F (82°C)
Cost (approximate)	\$40,000	\$50,000	\$180,000

References

1. Latimer, Wayne "Operational Experience with Compact Liquid Flow Provers", International School of Hydrocarbons, Norman, OK., April 14, 1982.
2. Physikalisch - Technische Bundesanstalt (PTB) "Test Results of Compact Prover", February, 1982.
3. Wunsch, Walter "Double Chronometry", International School of Hydrocarbons, Norman, OK., April 14, 1982.
4. Latimer, Wayne MAPCO Competitive Prover Tests April 22, 1982, Mont Belvieu, TX.
5. Dahn, Edward "Compact Prover", International Conference and Exhibit, Philadelphia, PA., October 18-21, 1982.
6. Originally presented at 62nd Annual GPA Convention March 14-16, 1983, San Francisco, CA.

COMMITTEE REPORTS

JOINT REPORT OF THE
EXECUTIVE COMMITTEE
AND THE
COMMITTEE ON NATIONAL MEASUREMENT POLICY
AND COORDINATION

Presented by Charles H. Greene, Chief
Administrative Services
New Mexico Department of Agriculture

REFERENCE KEY

TOO

INTRODUCTION

The Executive Committee and the Committee on National Measurement Policy and Coordination (P & C) presented its joint report to the 68th National Conference on Weights and Measures. This report consists of the interim report as printed in the Conference Announcement Book and as amended by the final report.

This report includes recommendations of both Committees based on written and oral comments received throughout the prior year and at the Annual Meeting.

Information Items

The following items are informational and required no formal action of the NCWM:

Reference
Key

Subject

101	Administrative Actions
102-1	Organization and Procedures Subcommittee
102-2	Changes Not Requiring NCWM Vote
102-8	Mail Ballot
103-1	Report of the Finance Subcommittee
104-1	Report of the Special Study Group on NCWM Membership
104-2	Membership Actions
105-1	Report of the Task Force on National Type Evaluation
105-2-2	Action of Executive Committee
106-1	Report of the Committee on Education, Administration, and Consumer Affairs
107	Laboratory Certification
108-1	68th Annual Meeting
108-2	Future Meeting Plans
109	OIML Update
110	Metric Update
111	Malcolm W. Jensen Memorial Awards

Voting Items

Formal Action (Vote) of the NCWM was taken on the following items:

Reference
Key

Subject

102-3	Voting Procedures
102-4	Chairman Elect
102-5-1	Executive Committee Structure
102-5-2	Implementation of Restructuring
102-6	Vice Chairman - Duties
102-7	Management of NTEP
103-2	Financial Management Procedures
103-3	Grant Administration
105-2-1	Laboratory Authorization Process

The Chairman announced his intent to include all voting items in a "consent calendar" as a single voting item. He then described each voting item individually, including the effect of a "yea" vote. Since no one requested removal of any item from the "consent calendar," the Chairman moved approval of the "consent calendar." The motion carried as follows:

	<u>Yes</u>	<u>No</u>
State Representatives	43	0
Delegates	56	0

The Chairman moved adoption of the entire report with editorial privileges to the Executive Secretary. The motion carried as follows:

	<u>Yes</u>	<u>No</u>
State Representatives	43	0
Delegates	56	0

101

ADMINISTRATIVE ACTIONS

The National Conference on Weights and Measures is in a growth trend as its officers and committee members organize to keep abreast of changing weights and measures needs through increased agendas and new programs.

Dr. Ernest Ambler announced planned increases in support of the Conference by the National Bureau of Standards at the 67th Annual Meeting. Two new programs singled out by Dr. Ambler for added resources were:

1. National Type Evaluation - a program for uniform nationwide evaluation of weighing and measuring devices based on reciprocity among the states.

2. National Training - underwriting the development of training materials primarily funded through a grant to the NCWM. The NCWM submitted a grant request to NBS asking for funding for two years:

1st Year	\$148,405
2nd Year	\$166,784
	<u>\$315,189</u>

A cooperative agreement has been signed by both NBS and the NCWM for funding of \$148,405 over a 12 month period beginning February 1, 1983.

Work under the Cooperative Agreement will be based on the plan developed by the NCWM Committee on Education, Administration, and Consumer Affairs (See their report, Reference Key 400).

It was incumbent on the NCWM leadership to respond responsibly to the new opportunities offered through increased NBS support. Consequently, I established two subcommittees of the NCWM Executive Committee to analyze the need for changes in NCWM operations and organizational structure to insure that we manage our responsibilities related to the new (and ongoing) programs.

- o Organization and Procedures Subcommittee
- o Finance Subcommittee

Following my election as Conference Chairman in July, 1982, and following review of the various Committee reports, I took several actions:

- o reassigned the technical working groups of the Task Force on Type Evaluation from the Task Force itself to the Committee on Specifications and Tolerances.
- o discontinued the Special Study Group on the National Weights and Measures System.
- o reassigned the Task Force on Package Control (which had reported to the Special Study Group on the National Weights and Measures System) to the Committee on Liaison.
- o named Kendrick J. Simila, Oregon, as the Conference Representative to PS 20/RS1 of OIML.
- o reassigned the Special Study Group on NCWM Membership from the Committee on National Policy and Coordination to the Executive Committee.
- o renamed the Task Force on Grain Moisture Measurement to the Advisory Committee on Grain Moisture Measurement; reassigned the Advisory Committee from the Committee on Liaison to the Committee on Specifications and Tolerances.

- o made appointments to the various annual and special committees.

Mr. John T. Bennett of Connecticut resigned as a Vice-Chairman of the Conference. The Executive Committee selected Mr. Tom Geiler of Massachusetts to replace Mr. Bennett.

The most recent organization chart of the National Conference on Weights and Measures is shown in the Reference Section at the end of these Proceedings.

102 ORGANIZATION AND PROCEDURES

102-1 ORGANIZATION AND PROCEDURES SUBCOMMITTEE

The report of the Organization and Procedures Subcommittee summarized those proposals that had been submitted to the subcommittee, both formally and informally, so that they could be reviewed and augmented in an orderly fashion at the interim meeting and, where consensus could be reached, presented to the full Committee for its deliberation. (See Appendix C for Subcommittee Report).

102-2 CHANGES NOT REQUIRING NCWM VOTE

Selected recommendations of the Organization and Procedures Subcommittee deal with changes to the administration of the Conference that can be implemented by the Executive Committee without Conference action. Of those recommendations, the Executive Committee voted to implement the following:

- o At the start of each Conference a review of the rules that govern voting would be presented. A brief synopsis of the rules will be included in the Conference material.
- o Prior to the commencement of the Conference all persons presiding at meetings shall have a review of parliamentary procedure and the Conference voting rules.
- o A "consent calendar" shall be developed to isolate those items of a non-controversial nature which can then be voted on in a body.
- o On controversial issues, the standing committee shall provide a speaker to lead off the debate by summarizing the reasoning of the committee.
- o The Executive Secretary shall provide to the members of the standing committee copies of policies or procedures that affect them.
- o The Executive Committee will continue to explore the question of incorporation.

- o The Organization and Procedures Subcommittee will continue to explore the need for a NCWM constitution and by-laws for discussion at the Interim Meetings in January 1984.
- o The Executive Secretary will compile and format in a uniform manner all existing NCWM administrative policies and procedures previously adopted.

102-3 VOTING PROCEDURES

The mechanics of voting have been of some concern to members. The Executive Committee concurred with the recommendation of the Organization and Procedures Subcommittee that there be a test of a procedure at the 68th Annual Meeting using a vote counting device. Such a test will be limited to one session, perhaps to a single Committee Report. The test procedure will be utilized in conjunction with and parallel to the current voting procedure in order to provide the basis for comparing the two. Realizing that the test procedure may not provide definitive (or clearly better) results, and that there may be other techniques with more promise, the Executive Committee does not recommend final adoption of the test procedure at this time.

The Executive Committee recommends adoption of the following position:

The Executive Committee recommends that alternative voting procedures for use to speed up the tabulation process and to keep a more accurate record of Conference ballots be explored.

102-4 CHAIRMAN ELECT

The Executive Committee recommends the establishment of a new elected office, Conference Chairman Elect.

The responsibility of the Conference Chairman Elect will be to:

- o serve as acting Conference Chairman in the event that the Chairman is unable to carry out the duties of that office.
- o perform other duties assigned by the Conference Chairman.
- o serve on the Executive Committee.

This recommendation would require the election of the Conference Chairman Elect at the Annual Meeting one year prior to the term of service as Conference Chairman. After serving one year as Chairman Elect, the incumbent would succeed to the Office of Conference Chairman.

The effect of this recommendation, if adopted, would be to select the Conference Chairman a year in advance of his term as Chairman. The Executive Committee makes this recommendation so that a Conference

Chairman can be provided important experience and training in preparation for his responsibilities, and with the expectation that more continuity in Conference programs would result.

102-5-1 EXECUTIVE COMMITTEE STRUCTURE

In keeping with the intent expressed at the 66th Annual Meeting, and echoed at the 67th Annual Meeting, to abolish the Committee on National Measurement Policy and Coordination (P & C) and to restructure the Executive Committee, and after study and discussion of the Alternatives identified by the Organization and Procedures Subcommittee, the following two part recommendation was made by the Executive Committee:

1. Abolish the Committee on National Measurement Policy and Coordination and assign its duties and responsibilities to the Executive Committee.
2. Restructure the Executive Committee to consist of the following twelve members: the Chairman, the Chairman Elect, the most recent still active past Chairman, the Treasurer, the President and the Executive Secretary (both ex officio, non-voting), and six members elected at large from the Conference. Initially, these six members at large shall be elected for the following terms: two members to serve for one year, two members to serve for two years, and two members to serve for three years; thereafter their successors shall serve for three-year terms. Insofar as practicable, the Nominating Committee in recommending candidates for the Executive Committee shall consider regional representation.

102-5-2 IMPLEMENTATION OF RESTRUCTURING

Those actions 102-4 and 1 and 2 of 202-5-1 shall be concurrent and take effect as of the close of the 68th Annual Meeting.

102-6 VICE CHAIRMEN-DUTIES

Affirmative action on Item 102-5-1 deletes, de facto, membership on the Executive Committee of the past Conference Chairmen (except the immediate past Chairman), the four Vice-Chairmen, and the Chaplain.

The Vice-Chairmen have chaired sessions of the Annual Meetings. The Executive Committee recommends that the duties of the Vice-Chairmen be revised to read:

The Vice-Chairmen shall chair the Conference sessions and fulfill any other duties as assigned by the Chairman. Vice Chairmen shall be nominated by the nominating committee and elected by the Conference for one-year terms. Vice-Chairmen do not serve on the Executive Committee.

The concept for a National Type Evaluation Program (NTEP) approved by the NCWM membership at the 67th Annual Meeting (Item 101) identifies the need to establish two organizations within the NCWM to carry out the NCWM responsibilities for the NTEP.

Board of Governors to govern and direct the activities, policies, and procedures of the NTEP. Note that operational management of the NTEP will be under the supervision of the Executive Secretary .

NTEP Advisory Committee to represent the interests of device and equipment manufacturers, marketers, and users.

The Task Force on Type Approval, and the Organization and Procedures Subcommittee of the Executive Committee explored several alternative approaches for enabling the NCWM to fulfill their key responsibilities. The Task Force, Subcommittee, and the Executive Committee have agreed on a recommendation that will provide for the Board of Governors and the Advisory Committee in an efficient and effective manner without establishing new committees requiring additional memberships.

The Executive Committee recommends that:

1. The Executive Committee serve as the Board of Governors for the National Type Evaluation Program (NTEP).
2. The Executive Committee utilize the technical committees of the NCWM to resolve technical issues regarding NTEP.
3. The industry members of the Technical Committee on National Type Evaluation will be the NTEP Advisory Committee and represent the interests of industry in advising the Board of Governors.

102-8 MAIL BALLOT

The work load of many NCWM Committees has been increasing. Some committees are finding it difficult to advance their work in a timely manner when limited to one or two meetings a year. Travel funds for meetings is very limited.

During the past year, the Executive Secretary has implemented and is employing a "mail ballot" system to provide for exchange of information among committee members and to solicit comments, recommendations, and positions of the members. This system has been used with the Executive Committee and the Committee on Specifications and Tolerances.

The Executive Committee endorses this procedure and requested the Executive Secretary to formalize the procedure (by development of a NCWM Administrative Procedure) and to extend its use to other standing, annual, and special committees and task forces.

103-1 REPORT OF THE FINANCE SUBCOMMITTEE

The Finance Subcommittee of the Executive Committee reviewed the financial planning and Management Procedures of the NCWM. Based on that review, the Subcommittee recommends the adoption of the following two procedures regarding (1) budgeting and administering NCWM funds, and (2) grant administration.

PROCEDURES FOR ESTABLISHING THE BUDGET AND ADMINISTERING
FUNDS OF THE NATIONAL CONFERENCE ON WEIGHTS AND MEASURES

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

(I) ESTABLISHING PRIORITIES

- (A) A general concept of priorities shall be established periodically, no less than annually, by the NCWM policy establishing group, called the "Executive Committee" presided by the Conference Chairman.

(II) BUDGET

- (A) The NCWM Executive Secretary shall, within 120 days after the annual meeting¹, propose a tentative budget for the following fiscal year² to include:
- (1) Anticipated sources and quantities of revenue.
 - (2) Recommended ordinary and extraordinary expenditures to be funded from the anticipated budget.
 - (3) Types of investments recommended for excess funds.³
 - (4) Anticipated need to draw on reserve funds or ability to provide additional funds to any existing reserve fund.
 - (5) Recommended dues and registration fee levels.

¹120 days permit study of the first quarter Treasurer's report.

²The fiscal year for the NCWM is from July 1 through June 30.

³Invested funds shall be Federally insured.

- (B) The proposed tentative budget as described in (II)(A) shall use the same account receipts and expenditures categories as described in (IV)(A) and submitted by the Executive Secretary within 120 days after the annual meeting to the conference budget review committee.
- (C) The Conference Chairman shall establish within 60 days after the annual meeting a budget review committee which shall:
 - (1) Be presided by the Conference Chairman.
 - (2) Consist of two weights and measures officials as appointed voting members,⁴ 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.
 - (3) Make necessary adjustments to the Executive Secretary's proposal by deliberation through the use of mailings and/or conference calls.
 - (4) Present a committee proposed tentative budget at the interim meeting to the Executive Committee for acceptance or return to the budget review committee for adjustment(s) to enable acceptance, normally to be completed prior to conclusion of the interim meeting.

(III) AUTHORITY

- (A) Acceptance by the Executive Committee of the budget review committee's tentative budget constitutes acceptability for the conference.

(IV) ACCOUNTING

- (A) The NCWM shall use receipts and expenditures accounts as follows:
 - (1) Receipts:
 - 1.1 Registration Fees - Annual Meeting
 - 1.2 Membership Fees
 - 1.3 Publications
 - 1.4 Interest
 - 1.9 Miscellaneous

⁴Terms for initially appointed voting members shall consist of one year for one member and two years for the other member with subsequent annual appointments of one member for a two-year term.

(2) Expenses:

- 2.0 Annual Meeting
 - 2.1 Hotel, Food Service
 - 2.2 Equipment, AV, Office
 - 2.3 Personnel
 - 2.4 Printing, Publication
 - 2.5 Conference Officers
 - 2.6 Speakers
 - 2.7 Travel
 - 2.9 Miscellaneous
- 3.0 Interim Meetings
 - 3.1 - 3.9 as above
- 4.0 Other Meetings
 - 4.1 - 4.9 as above
- 5.0 Special Programs
 - 5.1 Program Evaluation
- 6.0 Chairman's Activities
 - 6.0 - 6.9 as above
- 7.0 Membership
- 8.0 Printing and Publications
- 9.0 Administration
 - 9.1 Equipment
 - 9.2 Stationery, Mailing
 - 9.3 Treasurer Expenses
 - 9.4 Executive Secretary Expenses
 - 9.5 Services, Contracts
 - 9.6 Supplies
 - 9.9 Miscellaneous

(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 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 audit committee shall:

- (1) Be appointed by the Conference Chairman within 60 days after the annual meeting.
- (2) Consist of two members who served the previous year and one new member. One member is to be appointed chairman.
- (3) Conduct an audit and review of accounts (it is recommended the concluding audit be conducted within the first two days of the annual conference so questions can be resolved) to assure funds are received and disbursed in accordance with these procedures.
- (4) Issue a statement of findings in a committee report at the time of the annual meeting.

- End of Procedures -

The Executive Committee has the authority over expenditures of the Conference. In the past, the NCWM budget was based primarily on receipts derived from membership fees and registration fees. As of February 1, 1983, the NBS/NCWM Cooperative Agreement will provide approximately \$150,000 to fund initial development of training materials. Most of those funds will be spent on contract. Therefore, the NCWM Executive Committee will have the responsibility to manage the funds provided under the Cooperative Agreement including responding to reporting requirements of the NBS and fiscal management of contractors. The Subcommittee recommends the adoption of the following procedure.

GRANT ADMINISTRATION

Purpose - Provide organizational capability and integrity to assure maximum benefits to the NCWM and cause adherence to and fulfillment of the terms of grants in which NCWM is a recipient or beneficiary.

(I) ESTABLISHMENT OF GRANT ACCEPTABILITY

- (A) Acceptance of the concept for a tentative or actual grant proposal, whether originating outside or within the NCWM, shall be made by the NCWM policy establishing group, called the "Executive Committee," presided by the Conference Chairman. When, in the judgment of the Executive Committee, the proposed grant would significantly impact on objectives or activities of NCWM, the concept shall be presented for acceptance by vote to the general conference or, in the case of time constraints, by mail ballot to each of the latest State representatives to the conference. A majority vote of those voting would constitute acceptance.
- (B) A summary document compiled and/or approved by the Executive Committee shall be available on request for review and used as the basis for information to the membership. This document shall identify the following for each tentative or proposed grant:
 - (1) Proposed effective period of the grant.
 - (2) Obligations and liabilities of NCWM to grantor.
 - (3) Impact on existing objectives and activities of NCWM.
 - (4) Anticipated financial and other benefits directly derived through the grant.

(II) GRANT ACCEPTANCE

- (A) The Conference Chairman shall sign a proposed grant or agreement on behalf of the conference, providing acceptability according to (I)(A) and (B) and providing the actual contract is:
 - (1) Not substantially different from the grant proposal.
 - (2) Reviewed and recommended by the Executive Secretary and National Bureau of Standards (NBS) legal counsel.

(III) BASIC GRANT TERMS

(A) A grant must stipulate or refer to a plan which defines:

- (1) Tasks to be accomplished.
- (2) Expected product.
- (3) Assignment of responsible entity for completing the work.
- (4) Accountability and report schedules.
- (5) Payment schedule.
- (6) Effective dates including schedules if applicable.
- (7) Method of review and entity responsible.

(IV) REVIEW OF GRANT PERFORMANCE

(A) The reviewing entity⁵ shall report in writing periodically, at least every six months, to the Conference Chairman. Reports required by the grantor can suffice providing the review provides supplemental information helpful to the Conference Chairman. Each report shall include but will not be limited to:

- (1) Expenditures.
- (2) Current financial obligations.
- (3) Remaining balance.
- (4) Performance progress as obligated by the Grant.

(V) REPORT OF GRANT PERFORMANCE

(A) The Conference Chairman shall report periodically, at least every six months and at the conclusion of a grant, on the grant performance status to the Executive Committee and annually to the conference preferably at the annual meeting. The conference report shall include:

- (1) Current grants.
- (2) Grants terminated since the previous annual report.

(B) Any significant performance detractions from the terms of the grant shall be reported by the Conference Chairman to the Executive Committee after conferring with the Executive Secretary, within 30 days of such detraction.

⁵The reviewing entity, if not designated in the grant or referred plan, will be appointed by the Conference Chairman.

(VI) ACCESS

- (A) The Conference Chairman or designee(s) shall have access upon request to any relative report or product of a Contractor or Grantee.

(VII) GRANT CHANGES

- (A) The Conference Chairman may sign a grant modification providing the adjustment:
 - (1) Does not significantly alter the purpose of the grant.
 - (2) Is reviewed and recommended by the Executive Secretary, NBS legal counsel, and a majority of the Executive Committee.
- (B) A modification not meeting the criteria of (VII)(A)(1) and (2) shall meet the criteria (I)(A) and (B).

(VIII) CONTRACTING

- (A) The conference Executive Committee may authorize contractual performance and product responsibilities providing:
 - (1) The offer for bids and acceptance of bids are nondiscriminatory.
 - (2) The potential contractor presents optimal support and resources to fulfill the contract.
 - (3) The cost is reasonable for the expected task or product.
 - (4) The contract is not in conflict with the original grant.

(IX) FINANCIAL MANAGEMENT - CONTRACTOR

- (A) NCWM shall negotiate with any contractor as described in (VIII) and the Conference Chairman is authorized to sign an agreement providing the agreement is approved by the majority of the Executive Committee and reviewed and recommended by the Executive Secretary and NBS legal counsel.
- (B) The contractor shall be responsible for incurred costs until NCWM receives funds due from the grantor and subsequently makes payment.

(C) A contractor shall submit reports within a time period and in a manner specified to permit NCWM conformance to the primary grant. NCWM shall not retain such reports more than 15 days for review except to obtain additional information required for its approval.

(D) Payment to a contractor shall be according to NCWM procedures.

(X) FINANCIAL MANAGEMENT - PRIMARY RECIPIENT

(A) Funds necessary for interim payment of grant performance and product by NCWM may be taken from general funds of the conference according to the NCWM procedures providing replacement deposit is made promptly upon receipt from the grant.

These two proposed procedures constitute the report of the Finance Subcommittee of the Executive Committee.

Respectfully Submitted:

E. Heffron, Michigan, Chairman
J. Alloway, Nebraska
J. Blackwood, Texas
E. Delfino, California
T. Geiler, Massachusetts
D. Lynch, Kansas
K. Simila, Oregon
E. Stadolnik, Massachusetts
S. Valtri, Pennsylvania

103-2 FINANCIAL MANAGEMENT PROCEDURE

The Executive Committee recommends adoption of the proposed "Procedures for Establishing the Budget and Administering Funds of the National Conference on Weights and Measures," as amended.

103-3 GRANT ADMINISTRATION

The Executive Committee recommends adoption of the proposed "Procedure for National Conference on Weights and Measures' Grant Administration," as amended.

104 MEMBERSHIP

104-1 REPORT OF THE SPECIAL STUDY GROUP ON NCWM MEMBERSHIP

The Committee considered methods of increasing membership in the NCWM. We conclude that increased membership would ultimately result in increased registration and participation in the Conference program. Some of those benefits of membership in NCWM are:

1. Awareness of Federal Laws and Regulations.

- (a) Agenda items of the various conference committees address compatibility with Federal laws and regulations.
- (b) Representatives of Federal regulatory agencies correspond with committees as well as testify at committee interim hearings regarding agenda items.
- (c) The Conference Liaison Committee communicates with Federal agencies when Federal questions arise.
- (d) Members and attendees of the Conference become aware of areas of possible conflict between local laws and regulations and Federal counterparts.

2. Awareness of Federal Preemption.

- (a) Members and attendees of the National Conference have opportunity to become aware of Federal preemption through the same actions as in #1. above.

3. Uniformity of Interpretations of Laws and Regulations.

- (a) The National Conference is the only forum available (since 1905) for weights and measures' jurisdictions, industry, and consumers to develop not only uniform laws and regulations but also the interpretations of those laws and regulations.

4. Direct Communications with Federal Agencies.

- (a) Through the influence of the Conference, we are able to directly communicate with key Federal employees of Federal agencies impacting on weights and measures' activities.
- (b) Meetings between weights and measures' jurisdictions and Federal agencies are often arranged at the interim meetings held in January of each year and at the National Conference annual meeting held in July.
- (c) Individual or group problems of particular concern to individual jurisdictions or industries can effectively be approached through the collective strength of the conference.

5. Timely receipt of publications and NBS technical memos.

6. Updated handbooks (NBS & NCWM) and conference proceedings on yearly basis.

7. Awareness of NBS resources in coordinating jurisdictions' solutions to current problems (half-pricing and discount of gasoline metric sales).

8. Awareness of other jurisdictions' activities.
9. A more direct distribution of NBS material to local jurisdictions. (Materials could be distributed directly to local jurisdictions rather than through State offices).

We recommend the following suggestions be discussed:

1. Develop a complete mailing list of weights and measures jurisdictions and make direct mail solicitations to those non-member jurisdictions. To develop a more complete mailing list of weights and measures jurisdictions, the Executive Secretary of the National Conference should contact the various State and regional associations requesting that they submit the names and addresses of the weights and measures officials in their associations. In those States that do not have associations, the State director should be contacted requesting this information.
2. Develop a list of prospective associate members and make direct mail solicitations to those prospective members.
 - (a) Request a list of company names, addresses, telephone numbers, and names of representatives from those companies, within each weights and measures jurisdiction, that might have an interest in weights and measures or upon which weights and measures enforcement might have a significant impact. This list would not represent every company regulated by the local jurisdiction but would, rather, be a "best judgment" type of list.
 - (b) Request a list of company and individual representatives from regional conferences.
 - (c) Request a list from State and local associations.
3. Consider provisions for host or local jurisdiction officials to be able to attend conference as non-voting observer members at reduced rates.
 - (a) The reduced rate membership would permit individuals to observe the workings of the National Conference and to benefit from discussion of the agenda items. The fee might also provide those individuals with mailings of the conference documents or the mailings might be optional upon request.
 - (b) The fee should be established bearing in mind that these members may or may not be reimbursed by their jurisdiction for such expenses.
4. Consider provisions for retired personnel at reduced rates.

- (a) Communicate special provisions as well as existing provisions for membership as a retiree. Some confusion may currently exist regarding status.

The Special Study Group recommends:

- o Development of a list of prospective members.
- o Development of a NCWM brochure or mailing material to be sent to prospective NCWM members.
- o Establishment of special reduced membership fees and/or registration fees for retired, non-voting, or other categories of membership.
- o Expansion of the Special Study Group to include representation by industry and OWM.
- o Granting of its authority to proceed with the planning phase of the above recommendations as well as explore other possibilities.

Respectfully submitted:

W. R. Mossberg, California, Chairman
E. F. Delfino, California
T. F. Geiler, Massachusetts
S. F. Valtri, Pennsylvania

104-2 MEMBERSHIP ACTIONS

The Executive Committee reviewed the report of the Special Study Group and approved its recommendations.

List of Prospective Members. The Executive Secretary was requested to contact State directors and private sector companies and associations to obtain names and addresses of prospective members for inclusion in the NCWM mailing list.

NCWM Brochure. The Special Study Group was requested to undertake the development of a NCWM brochure and associated materials for use in soliciting new NCWM membership.

Reduced Registration Fee. The Executive Committee agreed to establish on a trial basis, a non-member registration fee of \$20 for the 68th Annual Meeting to encourage attendance of local weights and measures officials of the host State at the meeting sessions. Those attending on this basis would have the right of the floor but would not receive publications and mailings of the NCWM nor would they have voting privileges.

Authorization to continue its work was granted to the Special Study Group; the Chairman will appoint two additional members, one from industry and one from OWM.

105-1 REPORT OF THE TASK FORCE ON NATIONAL TYPE EVALUATION

The Task Force on National Type Evaluation met at and subsequent to the 67th Annual Meeting in Atlanta. Approval of the proposed NTEP concept at the 67th meeting and the submission by NBS of its "Plan for Implementation of a National Type Evaluation Program (NTEP)" (see Appendix A) established the basis for the detailed development of NTEP. The NBS Plan describes a schedule of major events culminating in the initial operation of NTEP in October 1984. This report provides information related to:

- o NBS legislative authority
- o Laboratory Authorization and draft NBS Handbook "Certification of Capability of State Measurement Laboratories"
- o Draft model State regulation
- o NCWM organizational and procedural changes
- o Draft NBS Handbook "Type Evaluations, Criteria and Test Procedures"

Implementation Plan

The NBS Plan (Appendix A) provides a step-by-step progression of tasks to be done culminating in an operating National Type Evaluation Program (NTEP). If all tasks are completed within the schedule presented, NTEP will begin operations in October 1983.

The NBS Plan is based on the concept "A National Type Approval Program (NTAP)" presented at and approved by the NCWM 67th Annual Meeting.* Two key actions are necessary at the 68th NCWM Annual Meeting in order to remain on schedule; adoption of:

1. changes in NCWM organization and procedures,
2. a model State regulation

NBS Legislative Authority

The basis for the NBS participation on a national type evaluation is contained in the United States Code, Title 15 (Commerce and Trade), Part 200 (Policies, Services, Procedures, and Fees). Applicable sections are:

200.100	Statutory functions
200.102	Types of calibration and test services
200.103	Consulting and advisory services
200.106	Publications
200.108	Request procedure

*NBS SP645 "Report of the 67th National Conference on Weights and Measures 1982" pages 36-41.

200.109	Shipping, insurance, and risk of loss
200.110	Priorities and time of completion
200.111	Witnessing of operations
200.114	Fees and bills
200.115	Description of services and list of fees, incorporation by reference

Section 200.115 incorporated NBS Special Publication 250 "Calibration and Related Measurement Services of the National Bureau of Standards" by reference. NBS SP250 recognizes the Office of Weights and Measures' role in these services (Chapter X, paragraph H). This paragraph specifically describes the current "Prototype Examination of Commercial Weighing and Measuring Devices, Reference and Field Standards." NBS proposes to rewrite paragraph H to embrace the functions described in its Plan (Appendix A) and the terminology of Type Evaluation (in lieu of Prototype Examination). Appendix B is the proposed revision of SP250, Chapter X, paragraph H.

Laboratory Authorization

Under the NTEP Concept (NBS SP645, pgs 36-41) evaluation of devices is the responsibility of "participating laboratories." The concept indicates that testing laboratories might be Federal (including NBS), State, or private.

At the meeting of the Task Force held during the Western W & M Association Meeting (Sept. 20-22, 1982), the Task Force decided that device evaluation based on Handbook 44 and the criteria and test procedures developed by the technical working groups could be conducted by selected State laboratories now and in the foreseeable future. Consequently, the task of authorizing laboratories became a simpler task.

The authorization criteria would be developed as Part II to the draft NBS Handbook "Certification of Capability of State Measurement Laboratories." See Item 107 for a description of the laboratory certification/authorization process. Part I establishes the basis for certifying the State laboratories in a series of testing and calibration areas. Therefore, the technical basis for evaluation of devices under NTEP exists. Participation under NTEP will require additional capabilities in terms of facilities and skills.

This Task Force recommends that laboratory authorization be developed based on use of State laboratories as NTEP participating laboratories, and that the authorization process be included within the existing NBS State Laboratory Certification process.

Model State Regulation

The Task Force worked with Mr. Allan Farrar, NBS legal advisor, and OWM to develop a Model State Regulation for National Type Evaluation for review by the Executive Committee and subsequent review by the Committee on Laws and Regulations (see L & R Committee Report for details).

NCWM Organization and Procedural Changes

The Task Force made recommendations to the Organization and Procedures Subcommittee of the Executive Committee for changes in the NCWM organizational structure to provide for guidance and management of the NTEP. Recommendations dealt primarily with the proposed Board of Governors and the Advisory Committee to the Board of Governors (See Reference Key 102-7 for discussion of this subject).

Summary

All milestones identified for development of NTEP are being dealt with on schedule. In order for this development to remain on schedule it will be necessary for the NCWM to approve the Model Regulation (proposed by the L & R Committee) and the organizational changes (proposed by the Executive Committee).

In addition the Task Force recommends that the Executive Committee seek endorsement of the proposed laboratory authorization plan.

Respectfully submitted:

E. Delfino, California, Chairman
G. Mattimoe, Hawaii, Chairman of Policy Working Group
J. Bartfai, New York
C. Parent, Gilbarco
N. D. Smith, North Carolina
D. Tonini, Scale Manufactures Association
A. Farrar, NBS ex-officio
A. Tholen, NBS, Executive Secretary

105-2-1 LABORATORY AUTHORIZATION PROCESS

The Executive Committee recommends the endorsement of the laboratory authorization process described in the report of the Task Force.

105-2-2 ACTIONS OF EXECUTIVE COMMITTEE

The Executive Committee approved the recommendations of the Task Force on Type Evaluation; NCWM organization changes (see Reference Key 102-7); and adoption of the Model State Regulation (L & R Committee Reference Key 202-1).

106-1 REPORT OF COMMITTEE ON EDUCATION, ADMINISTRATION, AND
CONSUMER AFFAIRS

A detailed briefing on the National Training Program was presented on Monday, January 17, 1983, from 9:00-11:00 a.m., moderated by Mr. Joseph Swanson, Chairman, Committee on Education, Administration, and Consumer Affairs. Mr. Swanson gave a general status report including decisions reached by the Committee at a meeting held in Salt Lake City, Utah, just prior to the Western Conference last September, and monthly conference calls since the National Conference in Atlanta, Georgia, last July.

The major decisions reached were: (1) the Texas A&M Engineering Extension Service was chosen as the contractor to work with the Committee in producing instructor and trainee manuals in 37 identified areas and (2) the first seven working groups have been organized and members have agreed to serve in preparing drafts of the technical material for the contractor in each program area. It was also reported that Dr. Charles Greene, Conference Chairman, has signed the necessary papers for the first year of a two-year grant of funds from NBS for this program. The Education Committee prepared a contractor work statement during its interim meeting, and work by the contractor is expected to begin March 1, 1983.

Mr. Richard Smith, Education Committee Technical Advisor, gave a detailed report covering the following program specifics.

- (a) Program background and goals
- (b) Program content and specific objectives
- (c) Identity of 22 functional modules and 15 elective modules
- (d) Format and suggested content of manuals
- (e) Organization responsibilities
- (f) Program activity flow charts
- (g) Identity of members of first seven working groups
- (h) Overall benefits of program

The complete text of Mr. Smith's report may be found in the Interim Report, Committee on Education, Administration, and Consumer Affairs, Reference Key 405, National Training Program.

Dr. Edward Heffron, Chairman, Executive Committee, Finance Subcommittee, presented a comprehensive, formalized plan for receiving and dispersing grant funds on behalf of the National Conference, both for this program grant and possible future funds that may be forthcoming for other Conference programs.

The Office of Weights and Measures is implementing the certification of State laboratories by measurement areas. The certification will be based upon the self-appraisal checklist completed by the Director and the metrologist, information OWM has on the laboratories based upon previous visits and on-site evaluations, and a review of the metrologists' training, capabilities, and data submitted to OWM. The certification will reflect the needs of the individual States, the services provided to the public, and the variations that exist among the laboratories. The certifications issued in 1983 will be for one year. A report of the OWM evaluation will be sent to each State submitting a self-appraisal checklist. Any misunderstandings, oversights, and minor deficiencies can be addressed in 1983 and resolved before the 1984 certifications are initiated.

The laboratory evaluation is intended to identify those areas where a laboratory can be improved to increase capabilities, performance, and efficiency. By formalizing the OWM evaluation criteria, the States will be more aware of what is expected in facilities and performance; thus, they will be better able to justify necessary improvements or equipment for the laboratory. A laboratory may be certified in a measurement area even though a weakness has been identified, provided it can adequately perform the measurement. By identifying areas for improvement, a State can work toward correcting any deficiencies that may exist. Some deficiencies can be corrected in the near future, while others may involve the laboratory building or facilities and can only be considered in long-term planning. In these cases, whenever the laboratory is modified or a new laboratory is constructed, the deficiencies in the laboratory are expected to be corrected.

Under the certification by measurement areas, laboratories are required to have a quality assurance policy statement and a document specifying good laboratory practices. This is necessary because some Federal agencies impose regulations on private laboratories requiring that any laboratory performing work for the private laboratories meet specific requirements. The establishment of the quality assurance policy and a good laboratory practices document should aid in satisfying these requirements.

Based upon the certifications by measurement areas, a laboratory directory will be prepared. The directory will list the measurement services available from the State laboratories and fees charged. The current listing of the metrologists and the laboratory addresses and telephone numbers will be included. A draft of the directory will be prepared in 1983 and distributed to the States for review.

Regional metrology groups will play an important role in the OWM certification program. The regional groups provide training, promote uniformity in test procedures, and conduct round robin testing of NBS calibrated standards as part of the measurement control programs being implemented. The round-robin results provide valuable information to

the States and to NBS regarding the ability of State laboratories to provide measurement results traceable to the national standards. All States are encouraged to participate in the regional metrology groups.

The authorization of laboratories to perform device evaluations for the National Type Evaluation Program (NTEP) will be done through the OWM laboratory program. This will be done because a mechanism for evaluating State laboratories already exists. The criteria to be used for laboratory authorization for NTEP will be included as a second part of the draft, "Certification of Capability of State Measurement Laboratories." Although the laboratory authorizations will be granted through the OWM laboratory program, this will be a separate program and a separate laboratory certificate will be issued for NTEP laboratories. The certification of a State laboratory for its metrology program does not authorize the laboratory to perform device evaluations for NTEP.

The initial scope of laboratory authorizations will include only the States. The scope may be increased in the future to include other laboratories as NTEP expands and encompasses tests requiring specialized equipment.

It is expected that NTEP will support only a small number of laboratories. A small number of laboratories also facilitates maintaining uniformity in type evaluations. It is expected that each authorized laboratory will test a range of devices to justify the time and cost of training and operating a type evaluation laboratory. The NBS will provide the training for performing type evaluations to the criteria and test procedures adopted by the National Conference on Weights and Measures (NCWM). Only those States that will accept the national "Certificate of Conformance" to be issued by NTEP will be eligible for authorization to perform type evaluations. Laboratory authorizations will be given only for those devices where a sufficient work load exists to justify the costs of training; otherwise, the device evaluations will be performed by the OWM staff.

In brief, the authorization process will consist of an OWM representative meeting with the State officials who will ultimately perform examinations. The type evaluation criteria, test procedures, and State requirements will be reviewed to assure a complete understanding and identify any differences in criteria. The State facilities and equipment will be evaluated to assure that they can perform the necessary tests. Next, joint examinations will be performed on devices to verify the uniform application of test criteria. Finally, the State officials will conduct separate examinations of devices to determine if they obtain the same results as OWM. Uniformity in test results among the NTEP authorized laboratories is essential to the success of NTEP.

108-1 68th ANNUAL MEETING

The 68th National Conference on Weights and Measures was held at the Red Lion Motor Inn, Sacramento, California, from July 17 through July 22, 1983. Sacramento, the capitol of California, is located between the High Sierras and the Pacific Ocean. The average temperature is 88 degrees Fahrenheit in July, all sunshine with zero days of rain.

The week was very busy but rewarding. Progress on new programs designed to benefit every constituent of weights and measures were reported. Most notably, the following were on the program:

- o implementation of a comprehensive State laboratory certification plan.
- o description of organization, procedural, and legal aspects of the National Type Evaluation Program.
- o explanation of the NBS Grant to the NCWM and subsequent work accomplished toward development of the National Training Program.

The membership was asked to take action on many key issues in these, as well as other areas which were addressed by the several standing and special committees.

- o Weights and Measures Regional Association Working Sessions were scheduled on Wednesday morning; therefore all committee final reports were available by 8:00 a.m., Wednesday.
- o voting commenced on Wednesday at 1:00 p.m. and ran through Thursday morning and early afternoon.

Meeting Schedule

The Executive Secretary reviewed the schedule of the 67th Annual Meeting as the basis for developing the schedule for the 68th Annual Meeting.

The Executive Committee agreed to follow the same general format with modifications designed to improve the overall efficiency of activities. The following recommendations were made:

- o schedule the L & R Committee on Monday to provide more lead time to prepare its final report.
- o announce that the session agendas will follow in sequence as shown on the schedule but will move continually; therefore, each committee will move through its agenda followed immediately by the next scheduled committee. This will permit more effective use of time.

Guest Program

While the members were involved in a full week of study and work, guests found a variety of interesting and unique activities awaiting them in and near Sacramento.

Included during this week were optional tours to:

OLD SACRAMENTO historic area covering 28 acres of the original city authentically restored to the 1850's - 1870's; the Gold Rush Days. With plank sidewalks and cobblestone streets, there are more than 250 unique shops and businesses to delight every visitor.

THE RAILROAD MUSEUM, located in Old Sacramento, it is the largest and most complete railroad museum in North America. A giant steam locomotive, a post office car, a vintage sleeper, the only cab-forward locomotive in existence, and much more, depict the early history of western railroading.

THE CAPITOL, California's State Capitol Building, painstakingly restored at a cost of 67 million dollars, recaptures the grandeur of its historic wealth and past.

NAPA VALLEY WINE COUNTRY is California's North Coast premium wine production area. Tour and sample the famous vineyards and wineries of Robert Mondavi, Inglenook, Charles Krug, Christian Brothers, and Beringer, to name a few.

108-2 FUTURE MEETINGS

Plans are continuing for the future annual meetings as follows:

69th Annual Meeting

Location: Boston, Massachusetts
Time: July 29 - August 3, 1984
Hotel: Westin

70th Annual Meeting

Location: Washington, D. C.
Time: Not fixed
Hotel: Not fixed

Subsequent Years

Several cities are being proposed for the 71st Annual Meeting (Detroit, Michigan; Columbus, Ohio; Denver, Colorado; Little Rock, Arkansas; Albuquerque, New Mexico). The Executive Committee will hear proposals from host cities at its interim meeting in January 1984.

See Report of Committee on Liaison.

This update was supplied by the Office of Metric Programs of the U.S. Department of Commerce.

Background

Our national policy on the metric system is one of voluntary conversion. Businesses and other groups that want to convert are free to do so, and our policy is consistent with this country's traditional free enterprise approach to business activities.

While the metric system is not compulsory, and no target date has been set for conversion, the Reagan Administration believes that metric capability is increasingly necessary for American businesses competing in the international marketplace if they want to maintain or improve their share of world trade. On October 1, 1982, the Administration created the Office of Metric Programs within the Department of Commerce to make it easier for businesses and other organizations to convert to metric. The office is a separate unit within the Office of Productivity, Technology, and Innovation and comes under the general responsibility of the Under Secretary for Economic Affairs.

Mission

One of the main missions of the Department of Commerce is to promote U.S. exports to expand our share of the international marketplace and improve our balance of payments. To compete abroad effectively, U.S. companies should consider producing metric products, because most of the world uses the metric system. Another important mission of the Department is to stimulate productivity. Many firms that change to metric can expect an increase in productivity. This results from such actions as reducing the number of sizes they need to keep in stock or simplifying record-keeping by avoiding the necessity of converting back and forth between measurement systems. It also gives companies the chance to look at their manufacturing processes and procedures that have been developed over the years and make changes for greater efficiency.

While our voluntary policy calls for the private sector to set the pace of metric conversion, the Office of Metric Programs focuses on producing a favorable environment for the change to take place. According to law, the mission of the Office of Metric Programs is "to plan and coordinate the increasing use of the metric system." The office is:

- o identifying and working to remove barriers that may stand in the way of voluntary metric conversion, e.g., Federal, state, or local rules or regulations;
- o bringing together representatives from public and private sectors to solve problems and share information;
- o informing U.S. businesses of the metric requirements of foreign markets;
- o acting as the coordinator of Federal agencies' metric conversions to prevent conflicting policies and practices;
- o providing technical and general information about the metric system to businesses and the public;
- o encouraging well planned and coordinated metric conversion programs to enhance benefits and avoid inefficiencies.

Staff and Budget

The Office of Metric Programs has a staff of five and a budget of \$300,000.

The Executive Committee discussed the proposal made by Mr. Don Mackay of NBS to establish a new NBS award to recognize the "significant contributions of Malcolm W. Jensen to the weights and measures field." Mr. Mackay recommended that the award would take the form of an annual presentation of a plaque to a recipient selected by either "the Executive Committee of the NCWM or by a NBS Laboratory Director."

Following discussion of the proposal, the Executive Committee proposed that award of scholarships to students in weights and measures or related studies would be more desirable than award of plaques. The Committee asked that the Executive Secretary follow up with Mr. Mackay and the Jensen family to explore the establishment of a memorial award.

C. H. Greene, New Mexico, Conference Chairman

J. W. Alloway, Nebraska

S. D. Andrews, Florida

A. J. Bartfai, New York

J. C. Blackwood, Dallas, TX

B. K. Boddicker, South Dakota

K. S. Butcher, West Virginia

J. M. Chohamin, Middlesex County, NJ

F. W. Daniels, Wayne County, IN

L. H. DeGrange, Maryland

E. F. Delfino, California

P. M. Fullinwider, Arizona

T. F. Geiler, Barnstable, MA

E. C. Heffron, Michigan

L. Letey, Colorado

J. F. Lyles, Virginia

D. L. Lynch, Kansas City, KS

F. Nagele, Michigan

A. M. Nelson, Connecticut

P. E. Nichols, Alameda County, CA

J. V. Pugh, South Carolina

K. J. Simila, Oregon

E. H. Stadolnik, Massachusetts

J. L. Swanson, Alaska

R. L. Thompson, Maryland

S. F. Valtri, Philadelphia, PA

A. D. Tholen, Executive Secretary, NCWM

EXECUTIVE AND NATIONAL MEASUREMENT POLICY AND COORDINATION COMMITTEES

APPENDIX A

PLAN FOR IMPLEMENTATION OF A NATIONAL TYPE EVALUATION PROGRAM

INTRODUCTION

GOAL: A national type evaluation program, acceptable to all States, that provides for design and performance evaluations of new weighing and measuring devices subject to weights and measures regulations.

BACKGROUND

The authority for most weights and measures enforcement rests with the individual States. Each State has the authority and is mandated to examine devices to determine compliance with established design and performance criteria. A manufacturer wishing to market devices and systems in interstate commerce must comply with all the requirements of each State. Fourteen States have laws or regulations requiring that a commercial weighing or measuring device be submitted for type evaluation before it can be declared legal for trade in those States. This can result in considerable expense and marketing delays to a device manufacturer wishing to obtain approval for entry of a device in several of these States. The remaining States either (a) turn to another agency, typically NBS, to determine if a device has been examined and complies with requirements, or (b) conduct more extensive field examinations on a new device when it is first encountered in the field. This can result in varying opinions on whether or not a device complies with requirements and can lead to nonuniform enforcement practices regarding the device.

ASSUMPTIONS

1. A State is not normally in a good position to evaluate a device for nationwide application. Many States have neither the resources nor the capability to do type evaluation testing and are fully supportive of a national program that will provide for uniformity of testing and for reciprocal acceptance of test results. The NBS, by virtue of its role as a technical advisor to the States in developing national standards and as participant in the review and development of international standards, has the exposure, knowledge, and experience to provide technical advice on a national basis.
2. Nonuniformity in device evaluations in the U.S. causes inefficiencies for manufacturers and enforcement officials alike.

3. Uniform test procedures and criteria acceptable to all parties are essential to conducting a successful type evaluation program. Handbook 44 is written in general terms to apply to a wide range of devices and, consequently, interpretations are necessary. Uniformity of test procedures, criteria, and interpretations can be achieved when all parties affected participate in the decision making process. This participatory process is the hallmark of the National Conference on Weights and Measures (NCWM).
4. A majority of manufacturers seek a single source of evaluation to satisfy the approval requirements for the entire country. This will minimize cost and facilitate production and marketing. Past experience demonstrates that most States will accept a device Report of Test issued by NBS.
5. The role described in this paper for NBS is consistent with its mission to promote uniformity in weights and measures laws and methods of inspection by serving as a technical advisor to the States and the National Conference on Weights and Measures.
6. OIML is in the process of developing an International Certification System that would permit a device to undergo a type evaluation in one country and then be accepted by all countries. When this is complete, U.S. participation in this system is essential for U.S. manufacturers to compete internationally. This necessitates a fully adequate U.S. program to be in place. Private communications have clearly indicated that a certification scheme closely associated with NBS will be the only one acceptable internationally.

LEGAL METROLOGY CONTROL SYSTEM

CONCEPT

A type evaluation program is the first of a three-stage legal metrology control system. Under the process described here, "type" devices, which in fact might be plans, schematics, drawings, or even pre-production models, are submitted for evaluation using agreed-to procedures and uniform criteria in authorized laboratories. (For purposes of the NTEP, production devices imported into the U.S. will be treated as "types" for evaluation purposes.)

Based on the results of evaluation, assuming the type meets the design and performance criteria, designs are fixed, component sources and tooling are established, acceptance test procedures are established, and production lots are manufactured for application to individual customer orders.

ROLES

Responsibilities under the control system follow current practices for the most part. In simplest terms, the government's role addresses three key stages:

1. Type evaluation carried out under the authority of the States through the NCWM with technical support of NBS;
2. Initial verification carried out by State and local authorities; and
3. Subsequent verification carried out by State and local authorities.

NATIONAL TYPE EVALUATION PROGRAM

SCOPE

The National Type Evaluation Program (NTEP) for commercial weighing and measuring devices and field test standards is a program for determining through uniform examination and testing procedures, that type devices and equipment (by manufacturer and model) are in conformance with applicable national legal metrology standards.

National legal metrology standards include applicable specifications, tolerances, and other design, engineering, technical, procedural, and administrative requirements for commercial weighing and measuring devices and field test standards as published in NBS Handbook 44 or in handbooks, guidelines, or other references established by the NTEP and adopted by the National Conference on Weights and Measures.

The type evaluation is a two-phase process: design evaluation and performance testing. Authorized laboratories, either governmental or private, may perform any phase of the NTEP under the collective authority of the States through the National Conference on Weights and Measures.

The NTEP is open to all States and all device manufacturers.

PURPOSE

Approval of the type submitted for evaluation is the first of a three-stage legal metrology control system demonstrating that devices conform to established metrological, technical, and administrative requirements as adopted by the National Conference on Weights and Measures.

DEFINITIONS AND PRECEPTS

Design evaluation is the analysis of a device with respect to:

- suitability for the intended application (design and operating characteristics)
- impact of design on the measurement process
- consistency with "equity" and existing equipment
- related criteria and information from State and Federal agencies and other nations.

Performance testing determines those operating characteristics that include accuracy, precision, and repeatability under varying loads, flows, power sources, and environmental parameters.

Conformance:

A decision by the National Bureau of Standards that the type of a device conforms to the design and performance requirements prescribed by the National Conference on Weights and Measures; evaluation may apply to whole systems, main devices or elements, or auxiliary devices or elements that impact on the commercial measurement process.

CONCEPT

The National Type Evaluation Program is perceived as consisting of the following components:

- Design and Performance Standards
The standards for commercial devices are continually amended, revised, and incorporated into NBS Handbook 44 through existing procedures of the NCWM.
- Test Criteria
These performance test criteria and design checklist have been developed by NBS, revised by the NCWM Technical Subcommittee of the National Type Approval Task Force, and are expected to become a new NBS handbook, revised and amended following NCWM procedures.
- Laboratory Authorization Criteria
These criteria are to be developed by NBS and reviewed and adopted by the NCWM.
- Type Evaluations
Evaluations will be performed by authorized labs (which may be State or NBS). Some performance evaluations, because of the size and nature of the device, will be field evaluations conducted by private and State organizations.

- Type Evaluation Certificate

NBS will assess the type evaluation and issue the type evaluation certificate.

Once NTEP becomes operational, a Board of Governors of NTEP will direct the activities, policies, and procedures of the NTEP. An agent of the Board of Governors of the NTEP will supervise operations and an NTEP Advisory Committee will represent the interests of the manufacturers, retail sales organizations, and users of commercial devices.

CRITERIA AND REQUIREMENTS

NBS Handbook 44, "Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices" (H-44), is a reference code book specifying both design and performance requirements for commercial measurement equipment adopted by all 50 States. In addition to H-44, test equipment for weights and measures enforcement agency use is evaluated against three existing NBS handbooks:

105-1, "Specifications and Tolerances for Reference Standards and Field Standard Weights and Measures, 1. Specifications and Tolerances for Field Standard Weights (NBS Class F),"

105-2, "Specifications and Tolerances for Reference Standards and Field Standard Weights and Measures, 2. Specifications and Tolerances for Field Standard Measuring Flasks,"

105-3, "Specifications and Tolerances for Reference Standards and Field Standard Weights and Measures, 3. Specifications and Tolerances for Graduated Neck Type Volumetric Field Standards."

Handbook 44 is written in general terms so as not to hamper device design and innovation unnecessarily. For type evaluations, therefore, interpretations of H-44 must be made in order to decide whether a new design does or does not comply with design requirements of H-44. Performance requirements are clearly defined in H-44, but type performance test protocols are not specified in this handbook. In order to meet these needs, a new handbook has been drafted to augment H-44 which describes the interpretations made in the conduct of NBS type evaluations and also provides checklists for manufacturers and performance test protocols that are being used by NBS, California, and the Federal Grain Inspection Service (FGIS) in their type evaluations (draft distributed as NBSIR 80-2179, "Type Approval Criteria and Test Procedures"). The first draft was studied, modified, and endorsed by the Technical Subcommittees of the NCWM National Type Approval Task Force and approved by the NCWM at its 67th Annual Meeting.

Significant additions have been made by the Technical Committees and approval will be requested at the 68th Annual Meeting. This handbook will be published as a new NBS handbook to accompany H-44 and used as the design assessment criteria for National Type Evaluation once adopted by the NCWM.

LABORATORY AUTHORIZATION

1. Authorization Process Agreement is drafted by NBS and sent to NCWM for adoption.
2. NBS announces Laboratory Authorization Process in appropriate media.
3. Laboratory applies to NBS for authorization.
4. NBS reviews application.
5. NBS sends criteria for authorization and questionnaire to the inquiring laboratory.
6. The laboratory returns the completed questionnaire to NBS for evaluation.
7. NBS evaluates questionnaire and schedules on-site inspection of laboratory.
8. The on-site inspection is conducted and the results are reported to NBS.
9. The on-site inspection results are reviewed by NBS.
10. A Certificate of Authorization is sent to the laboratory with a copy to NCWM.
11. List of authorized laboratories maintained by the NCWM.

CONDUCT OF EVALUATIONS

A type device will normally be processed through a two-phased evaluation:

- design evaluation, and
- performance evaluation.

The design evaluation will be conducted by NBS professional staff or authorized laboratory staff who are specially experienced in the considerations needed.

The performance evaluation will be conducted in authorized laboratories.

REVOCABILITY OF A CONFORMITY DECISION

Certificate of conformity of a type can be revoked by decision of the NBS authority:

1. When it is found during initial or subsequent verification that production devices present faults that render the devices unsuitable for their intended purpose.
2. When the production devices are not the same as the device that has been issued an NTEP conformance certificate.
3. When legal requirements change and the conforming model is not consistent with the change.

The manufacturer will have to apply for re-evaluation when he makes a change to the device.

DEVICE POPULATION PROJECTIONS

Table 1 provides the potential market of equipment for a National Type Evaluation Program. These estimates are based on the present output of NBS and the State of California, anticipated technological innovations, and that portion of the market presently not utilizing this program. It is anticipated that the demand will increase after the first year's operation, peaking in the second or third year, and leveling off in the fourth year to an average annual demand.

The quantities are for actual evaluations conducted, not certificates issued, since in some instances the issuance of a certificate may require tests on two or more devices.

The categories of equipment are based on codes of NBS Handbook 44 and, to some extent, the time involved in the examination of the equipment. There is a final category of "field test equipment" denoting equipment necessary for field enforcement agency use rather than commercial measurement. This equipment is evaluated against the NBS Handbook 105 series (see CRITERIA AND REQUIREMENTS).

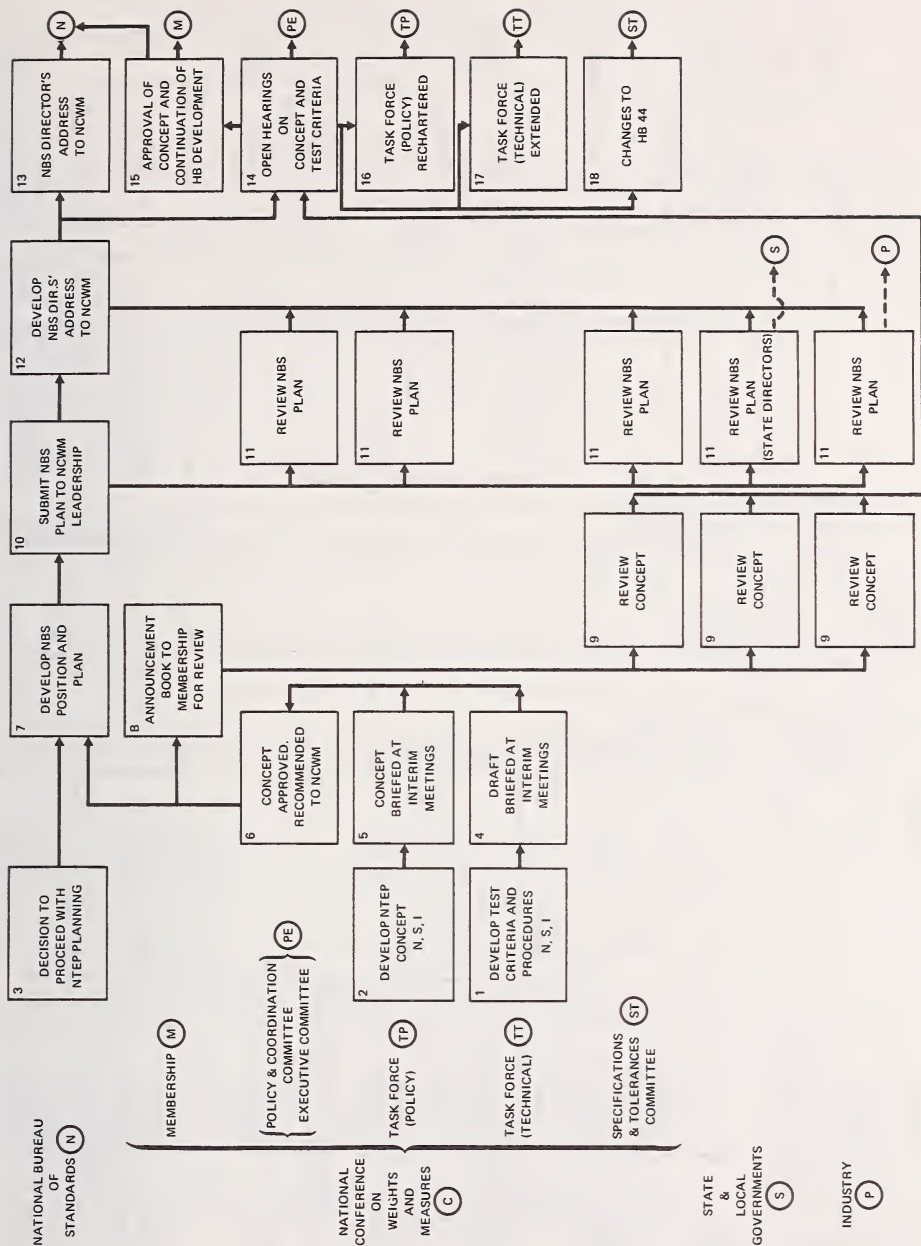
Table 1.
Device Population Projections
(Potential Market)

<u>Scales and Weighing Systems</u>	Fiscal Year			
	<u>83</u>	<u>84</u>	<u>85</u>	<u>86</u>
o Bench and counter, 30-lb capacity or less	30	35	35	30
o Bench, counter, and floor, 30-lb to 2000 lb	15	20	20	20
o Self-contained, over 2000 lb	10	15	15	10
o Large capacity	15	20	20	15
o Indicating elements	20	25	25	20
o Printers	5	10	5	5
 <u>Liquid Measuring Device Systems</u>				
o Retail motor fuel dispensers	5	10	5	5
o Computing registers/consoles	20	25	20	15
o Slow-flow meters	2	3	2	1
o Vehicle tank meters	3	5	5	3
o Wholesale meters	3	5	5	3
o Indicating elements	5	10	10	5
 <u>Other Devices and Systems</u>				
o Volumetric measures	10	15	10	10
o Fabric measuring devices	2	2	1	1
o Linear measures	2	2	2	2
o Taximeters	3	5	3	2
o Timing devices	2	5	3	2
o Grain moisture meters	5	5	2	2
o Field test equipment	<u>5</u>	<u>5</u>	<u>5</u>	<u>5</u>
Totals	162	222	193	156

Note: If the average cost of a type evaluation is estimated at \$1000, then the figures above represent potential business incomes to authorized labs. The cost of obtaining and maintaining a laboratory authorization must be examined in light of this income, because the cost/revenue ratio may be such that almost no private labs will apply.

SCHEDULE FOR IMPLEMENTATION

The following three charts describe the decision and task process necessary to establish a National Type Evaluation Program. The charts track this process from fiscal year '82 to fiscal year '85 according to major participating organizations or sectors: NBS, four subgroups of the NCWM, the voting membership of the NCWM, State and local governments, and industry. Individual decision and task statements are numbered in a time sequence culminating in operation of a National Type Evaluation Program under the auspices of the NCWM by October 1984.

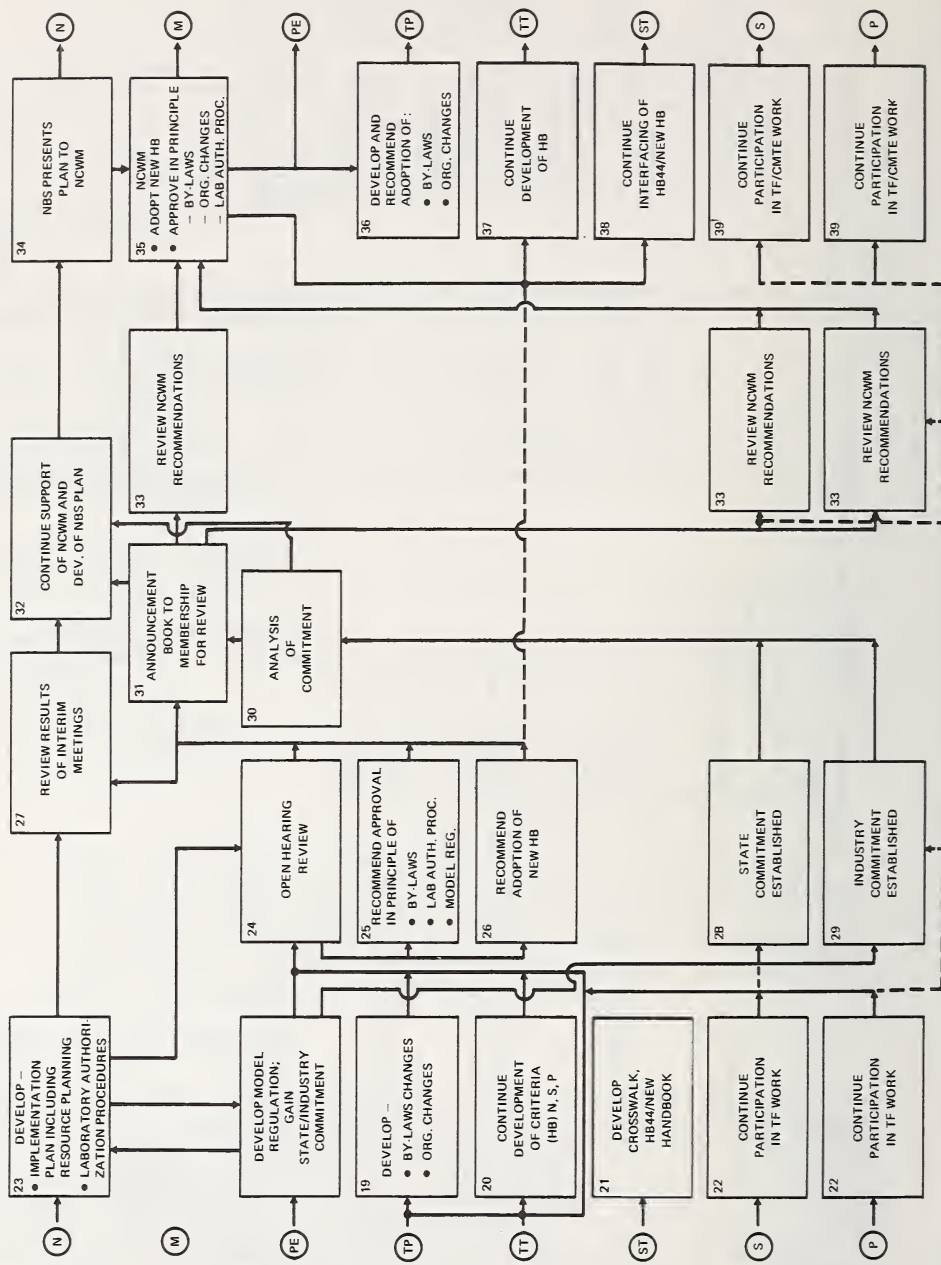


JULY 1983

MAY 1983

JAN. 1983

OCT. 1982

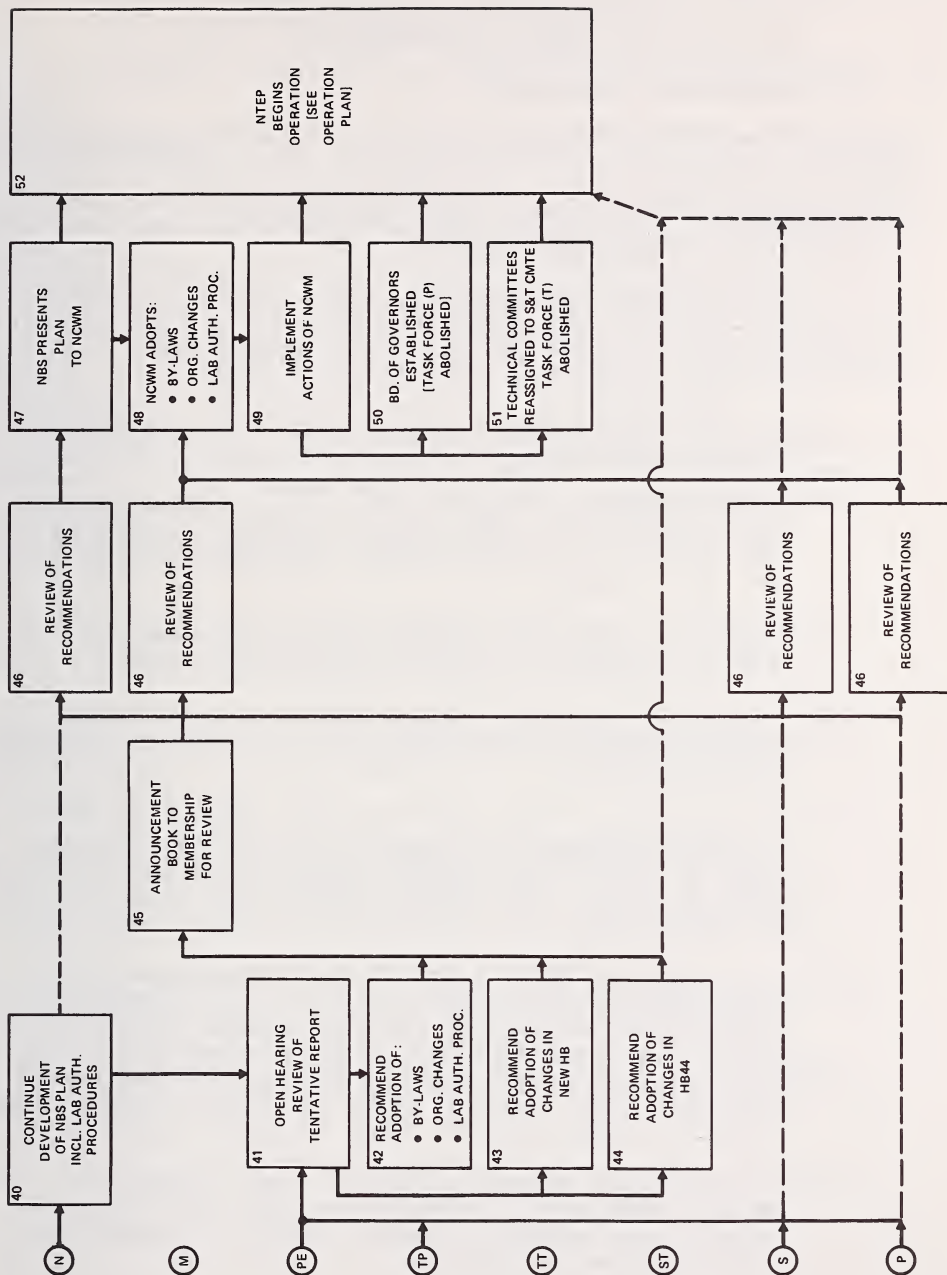


JAN. 1984

MAY 1984

JULY 1984

OCT. 1984



PROPOSED REVISION OF NBS SP250
CHAPTER X, PARAGRAPH H

H. Office of Weights and Measures

The role of the Office of Weights and Measures (OWM) is to provide leadership and those technical resources that will assure accuracy of the quantity representations in all commercial transactions for all buyers and sellers in the United States, and to promote a uniform national weights and measures system.

In fulfilling its mission, OWM engages in a wide range of activities, including providing the secretariat and other technical input for the National Conference on Weights and Measures. Foremost is the assistance offered to the States in the following areas:

- (1) The development of model weights and measures laws and technical regulations for the States and local jurisdictions.
- (2) The development and dissemination of design and performance specifications for various standards of mass, length, and capacity for use as State and local reference, laboratory, and field standards.
- (3) The design of testing equipment and the development of testing procedures for weighing and measuring devices.
- (4) The examination, test, and/or evaluation of weighing and measuring devices and reference and field standards submitted by manufacturers.
- (5) The evaluation of test results and data submitted to OWM or to those Measurement Laboratories that have been authorized by NBS to examine, test, and/or evaluate weighing and measuring devices and reference and field standards submitted by manufacturers.
- (6) The issuance by OWM of a Certificate of Conformance to the manufacturer of those weights, measures, and weighing or measuring instruments or devices that conform to the technical requirements set out in NBS Handbooks 44, 105-1, 105-2, or 105-3 as evaluated by OWM or by those Measurement Laboratories that have been authorized by NBS to conduct such evaluation under the National Type Evaluation Program.
- (5) The calibration of State standards. State weights and measures laboratories perform calibrations and tolerance tests of mass, volume, and length secondary standards for industry and service agencies.

- (6) The conduct of technical training in weights and measures enforcement and laboratory metrology. OWM serves as a central resource for metric coordination for the States and local jurisdictions, and prepares and disseminates information on standards, testing equipment, technical procedures, technical investigations, and standard practices.

Type Evaluation of Commercial Weighing and Measuring Devices, Reference and Fields Standards

OWM provides technical and administrative support to the National Type Evaluation Program (NTEP) which provides for evaluation of: (1) type weighing and measuring devices to determine compliance with the requirements of NBS Handbook 44, "Specifications, Tolerances, and Other Technical Requirements for Commercial Weighing and Measuring Devices," and (2) reference and field standards to determine compliance with the requirements of NBS Handbook 105-1, "Specifications and Tolerances for Reference Standards and Field Standard Weights and Measures, Specifications and Tolerances for Field Standard Weights (NBS Class F)," NBS Handbook 105-2, "Specifications and Tolerances for Reference Standards and Field Standard Weights and Measures, Specifications and Tolerances for Field Standard Measuring Flask," and NBS Handbook 105-3, "Specifications and Tolerances for Reference Standards and Field Standard Weights and Measures, Specifications and Tolerances for Graduated Neck Type Volumetric Field Standards."

This program may be used by manufacturers and weights and measures officials in determining the acceptability of devices for commercial use or the suitability of reference and field standards.

Devices will be examined at any stage of development on request. The evaluation may be made in the laboratories of NBS (and/or laboratories authorized by NBS), or at the factory or in the field by NBS or authorized laboratories.

When a device is found to be in compliance with NBS Handbook 44, or standards in compliance with NBS Handbooks 105-1, 105-2 or 105-3, a Certificate of Conformance will be issued by the NBS to the submitter and copies sent to each State Weights and Measures offices.

When a device is found not to be in conformance, the submitter will be notified by letter and the discrepancies fully explained. The equipment may then be modified and resubmitted. If it is the submitter's decision not to make any modifications, a report of test will be issued to the submitter detailing the areas where discrepancies exist.

To obtain a type evaluation, follow the request procedure described in NBS 250 Chapter I, Paragraph C (Request Procedure) and send the request to:

The Office of Weights and Measures
National Bureau of Standards
Washington, D.C. 20234

Procedures for shipping, insurance, testing priorities, time of completion, and NBS reports are described in NBS 250, Chapter I, Paragraphs:

- D. Shipping, Insurance, and Risk of Loss
- E. Priorities and Time of Completion
- F. Use of NBS Reports

APPENDIX C

REPORT OF ORGANIZATION AND PROCEDURES SUBCOMMITTEE

There are several proposals which deal with restructuring the Executive Committee:

Proposal 1

The Executive Committee shall be composed of 10 elected members who shall serve for staggered terms (1, 2, 3 years), along with the elected conference officers and present ex officio members.

Proposal 2

There shall be a Board of Directors which shall be composed of the Chairman, the Chairman-Elect, the past Chairman, four Vice-Chairmen who shall be the Presidents of the Regional Conference and who shall serve for three years from the commencement of their presidency, the Chairman of the Associate Membership, and present ex-officio members. The Executive Committee shall be composed of the Chairman, the Chairman-Elect, the Four Vice-Chairmen, and the present ex-officio members.

Proposal 3

The Executive Committee shall be composed of a Chairman, Chairman-Elect, Four Vice-Chairmen elected one from each Regional Conference with three members elected "at-large," and the present ex-officio members. The Vice-Chairmen shall serve for three years; the at-large members shall serve for two years.

Proposal 4

The Executive Committee shall be composed of the Conference Chairman and the five most recent past chairmen who are still active in weights and measures; the President and the Executive Secretary would be ex-officio members.

Proposal 5

The Conference Chairman shall be elected from the five Vice-Chairmen; the Vice-Chairmen shall be elected as follows: four from the Regional Conferences and one at-large by the Conference.

There were several recommendations regarding the duties of the Executive Committee as it is presently constituted:

Recommendation 1

The Executive Committee should have specific subcommittees who would report on progress to the Executive Committee, with a formal report to the Conference. The Vice-Chairmen would chair the subcommittees.

Recommendation 2

Each of the Vice-Chairmen shall be assigned as liaison to a standing committee and present a summary report to the full Executive Committee.

Recommendation 3

Each of the Vice-Chairmen shall be assigned as liaison to a standing committee with the fifth Vice-Chairman a non-voting member-at-large to the standing committees.

Recommendation 4

The duties of the Executive Committee and the P & C Committee shall be merged.

There were several recommendations regarding the voting procedures at the National Conference:

Recommendation 1

Voting on S & T and L & R items shall be on a two-year cycle. Items would be voted on each year, but only items in the system for two years would be finalized. Items would be voted up or down, only. The issue would be fixed thirty days before the Conference.

Recommendation 2

Voting on S & T and L & R items would be in alternate years.

Recommendation 3

At the start of each Conference a review of the rules that govern voting would be presented. A brief synopsis of the rules will be included in the Conference material.

Recommendation 4

Prior to the commencement of the Conference all persons presiding at meetings shall have a review of parliamentary procedure and the Conference voting rules.

Recommendation 5

A "consent calendar" shall be developed to isolate those items of a noncontroversial nature which can then be voted on in a body.

Recommendation 6

Items that are presented in the interim reports and that are to be voted upon shall be entered on a word processor or mini-computer. The consent items will be determined by having each voting member fill out a card (mark/sense) at the close of the open meetings and shall have the following categories: support; oppose; desire further debate. Those items that "pass" or "fail" will be so indicated on a list the next day and removed from the items that require further debate.

Recommendation 7

Any item that requires substantive amending shall be sent back to the committee of origin until the next Conference.

Recommendation 8

Voting shall be by a show of placards/hands, and tabulation used only where issue is in doubt.

Recommendation 9

If recording of votes is necessary then the number of people doing the tallying should be increased.

Recommendation 10

Limit the amount of debate time for each issue.

There were some recommendations regarding the Nominating Committee:

Recommendation 1

The information supplied to the Nominating Committee should be automated so that updated information can be available to the members.

Recommendation 2

The Committee should meet at the interim meeting and be composed of the five most recent past active chairmen with the Executive Secretary as ex officio member.

The following recommendations are of a general nature:

1. The Conference shall incorporate.

2. A task force shall be appointed to draft a constitution and by-laws for the conference.
3. Membership eligibility shall be in conformance with the requirements of the Regional Conferences.
4. Staff assistance to the standing committees shall change each year with the same person returning to each committee not more than once every three years.
5. Task forces with limited mandates shall be set up to deal with pressing as well as long range issues. Membership on these task forces shall be composed of both active and associate members.
6. The Conference schedule should be reorganized: all open meetings of lesser controversy shall be held simultaneously on the first morning; L & R and S & T would each have half a day to present their reports and allow for debate; all regional meetings would be held on Tuesday afternoon, to allow for coordination prior to the final reports.
7. The Conference should put on a sales campaign to get at least the 50 State representatives to be present during the Interim Committee Meetings.
8. The index of the Conference report should be updated from 1971 to 1982 and then updated annually.
9. On controversial issues, the standing committee should provide a speaker to lead off the debate by summarizing the reasoning of the committee.
10. The Conference should prepare a presentation to be submitted to the Governors of those States that have split weights and measures jurisdictions to point out the possible areas of non-uniformity.

Respectfully submitted:

S. D. Andrews, Florida, Chairman
Barbara Boddicker, South Dakota
John Chohamin, New Jersey
F. M. Daniels, Indiana
Patricia Fullinwider, Arizona
Leo Letey, Colorado
Jim Lyles, Virginia
Frank Nagele, Michigan
Pat Nichols, California
John Pugh, South Carolina
Dick Thompson, Maryland

The Committee on Laws and Regulations presents its report to the 68th National Conference on Weights and Measures. This report consists of the interim report as printed in the Conference Announcement and as amended by the final report.

The report comprises recommendations of the committee formed on the basis of written and oral comments received during the year and oral presentations made during the general meeting of the committee.

All section references and references to model regulations are with respect to National Bureau of Standards Handbook 130, 1983 Edition, "Model State Laws and Regulations" (H-130).

NOTE: Except where paragraphs or sections are to be added or completely revised, changes to H-130 are shown as follows: that which is to be deleted is shown lined out, and that which is to be added is underlined. When new sections are to be added or completely revised, the section appears in italics.

Presented below is the list of voting and informational items. (Items that report work in progress and action that the Committee is contemplating but is not ready to propose to the Conference this year are information items and are marked in the text with an asterisk.)

CONSENT VOTING ITEMS

These are voting items that were grouped in the final vote.

Handbook 130

- 201-2 Name Change from "Model" to "Uniform"
- 201-3 Use of the Term "Mass" and of SI Symbols

Model State Packaging and Labeling Regulation

- 203-3 Section 7. Declaration of Quantity: Nonconsumer Packages (Metric-Only Labels)
- 203-4 Section 10.9.5.(b) Sewing Threads, Handicraft Threads and Yarns
- 203-5 Bakery Products: Variations from Declared Net Weights
- 203-6 Nonwoven Synthetic Scouring Pads: Variations from Declared Net Quantities
- 204-6-3 Section 10.11. Bark Mulch: Variations from Declared Volume

Model State Regulation for the Method of Sale of Commodities

- 204-4 Section 2.13. Insulation
- 204-5 Section 2.16. Precious Metals
- 204-6-1 Section 2.17. Bark Mulch

Policy and Guidelines

- 204-6-2 Bark Mulch/Package Test Method
- 207-3 Method of Sale of Clams, Mussels, and Oysters
- 207-4 Method of Sale of Vegetable Oil

General

- 208-2-1 Long Range Plan/Goals and Objectives of the Committee on Laws and Regulations

(All of the items on the consent calendar were adopted.)

SEPARATE VOTING ITEMS

These voting items were voted upon separately.

Handbook 130

- 201-1-1 Model State Regulation for National Type Evaluation

Model State Weights and Measures Law

- 202-1 Adoption of Regulations in H-130 by Citation
- 202-2 Section 12. Sale from Bulk

Model State Regulation for the Method of Sale of Commodities

- 204-3 Section 2.4.2. (Peat and Peat Moss) Units
- 204-7 Section 2.18. Kerosene

Policy and Guidelines

- 207-1 Policy and Guidelines on Motor Fuel Deliveries (Gas Pump)
 Price Posting as Related to Cash Discounts
- 207-2 Method of Sale of Motor Fuel Containing Alcohol
- 207-5 Method of Sale of Potpourri

(The results of voting appear at the end of each of these items.)

INFORMATION ITEMS

Handbook 130

- 201-1-2 Discussion of Proposed Model State Regulation for National Type Evaluation
- 201-4 Use of the Term "Intrastate" in the Models

Model State Weights and Measures Law

- 202-3 Section 6.13. (Reference to Handbook 67)

Model State Packaging and Labeling Regulation

- 203-1 Section 12.2. Magnitude of Permitted Variations (Reference to Handbook 67)
- 203-2 Sections 6.7.1.(d) Proviso and 6.7.2. Proviso (Random Package Quantity Declaration)

Model State Regulation for the Method of Sale of Commodities

- 204-1 Survey on State Adoption of the Model Regulation
- 204-2 Ice Cream and Frozen Dessert Combination Foods
- 204-8 Potting and Top Soil

Model State Regulation for the Voluntary Registration of Servicepersons and Service Agencies for Commercial Weighing and Measuring Devices

- 205 Model State Regulation for the Voluntary Registration of Servicepersons and Service Agencies for Commercial Weighing and Measuring Devices

Model State Open Dating Regulation

- 206 Model State Open Dating Regulation

General

- 208-1 Task Force on Package Control
- 208-2-2 Long Range Plan/Tasks of the Committee on Laws and Regulations
- 208-3 Multi-Unit, Combination, and Variety Packages/All Units Clearly Visible

(These items were adopted as part of the final report of the committee.)

201-1-1 MODEL STATE REGULATION FOR NATIONAL TYPE EVALUATION

The Committee met with the Executive Committee and the Task Force on National Type Approval on several occasions during the Interim Meetings to work out a model regulation to recognize the National Type Evaluation Program (NTEP). The NCWM Task Force on National Type Approval analyzed and discussed the provisions of the Model State Weights and Measures Law as set out in NBS Handbook 130 "Model State Laws and Regulations." On the basis of such analysis, it is the opinion of the Task Force and the Committee that Section 6 of the Model State Weights and Measures Law (in particular Sections 6.3, 6.6, 6.9, 6.10, and 6.11), together with the definition of the term "weight(s) and (or) measure(s)" as given in Section 1.1, are broad and inclusive enough to authorize State weights and measures agencies to conduct a type evaluation program or to require a type evaluation based on the technical requirements specified in Section 4 of that Model Law. (Each State must analyze its own weights and measures law in order to determine whether the Task Force's opinions with respect to the Model Law applies to that individual State). Therefore, the Task Force recommends no changes to the Model State Weights and Measures Law. However, the Task Force recommends a Model State Regulation for National Type Evaluation as a necessary adjunct to recognize and enable participation in the National Type Evaluation Program administered by the National Bureau of Standards.

The proposed model regulation is quite brief, leaving the details of administration of the program, such as the manner of submitting devices, treatment of proprietary data, appeals, correction of errors, and notice of test results to the administrative policies of the National Bureau of Standards¹, and of the National Conference on Weights and Measures², and to the criteria established under the Certification of State Measurement Laboratories³. Setting fees for type evaluation would be the prerogative of each State operating a Participating Laboratory.

This model should be considered as part of the overall NTEP presented in the Executive Committee report (see reference keys 105-1, 105-2, and 102-7). The proposed model regulation, including a background statement, is presented below. After the proposed model regulation, there is a general discussion of several important sections of the

¹See reference key 105-1

²See reference key 102-7

³See reference key 105-2

proposed model (reference key 201-1-2) which will prove useful in understanding the extent of the model regulation and how it is intended to be applied.

The Committee recommends the following model regulation for Conference approval:

MODEL STATE REGULATION FOR NATIONAL TYPE EVALUATION

1. BACKGROUND

The Model State Regulation for National Type Evaluation is a necessary adjunct to recognize and enable participation in the National Type Evaluation Program administered by the National Bureau of Standards. The proposed model regulation specifically authorizes: type evaluation; recognition of a National Bureau of Standards "Certificate of Conformance" of type; the State Measurement Laboratory to operate as a Participating Laboratory, if authorized by the National Bureau of Standards under its program of certification of State Measurement Laboratories; and, the State to charge fees to those persons who seek type evaluation of weighing and measuring devices.

2. INTENT

It is the intent of this model regulation to have all States use the National Type Evaluation Program, as approved by the National Conference on Weights and Measures, as their examining procedure.

3. STATUS OF PROMULGATION

This model regulation is recommended to the States for adoption.

TABLE OF CONTENTS

SECTION

1. *Application*
2. *Definitions*
 - 2.1. *National Type Evaluation Program*
 - 2.2. *Type Evaluation*
 - 2.3. *Type*
 - 2.4. *Participating Laboratory*
 - 2.5. *Certificate of Conformance*
 - 2.6. *Director*
3. *Certificate of Conformance*
4. *Participating Laboratory*
5. *Revocation of Conflicting Regulations*
6. *Effective Date*

Section 1. Application

This regulation shall apply to all classes of devices and/or equipment as covered in National Bureau of Standards Handbooks 44, 105-1, 105-2, and 105-3.

Section 2. Definitions

2.1. *National Type Evaluation Program.* -- The term "National Type Evaluation Program" shall be construed to mean a program of cooperation between the National Bureau of Standards, the National Conference on Weights and Measures, the States, and the private sector for determining, on a uniform basis, conformance of a type with the relevant provisions of National Bureau of Standards Handbook 44, "Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices," National Bureau of Standards Handbook 105-1, "Specifications and Tolerances for Reference Standards and Field Standard Weights and Measures, Specifications and Tolerances for Field Standard Weights (NBS Class F)," National Bureau of Standards Handbook 105-2, "Specifications and Tolerances for Reference Standards and Field Standard Weights and Measures, Specifications and Tolerances for Field Standard Measuring Flask," or National Bureau of Standards Handbook 105-3, "Specifications and Tolerances for Reference Standards and Field Standard Weights and Measures, Specifications and Tolerances for Graduated Neck Type Volumetric Field Standards."

2.2. *Type Evaluation.* -- The term "type evaluation" shall be construed to mean the testing, examination, and/or evaluation of a type by a Participating Laboratory under the National Type Evaluation Program.

2.3. *Type.* -- The term "type" shall be construed to mean a model or models of a particular measurement system, instrument, element, or a field standard that positively identifies the design. A specific type may vary in its measurement ranges, size, performance, and operating characteristics as specified in the Certificate of Conformance.

2.4. *Participating Laboratory.* -- The term "Participating Laboratory" shall be construed to mean any State Measurement Laboratory that has been certified by National Bureau of Standards, in accordance with its program for the Certification of Capability of State Measurement Laboratories, to conduct a type evaluation under the National Type Evaluation Program.

2.5. *Certificate of Conformance.* -- The term "Certificate of Conformance" shall be construed to mean a document issued by the National Bureau of Standards based on testing in participating laboratories, said document constituting evidence of conformance of a type with the requirements of National Bureau of Standards Handbooks 44, 105-1, 105-2, or 105-3.

2.6. *Director.* -- The term "Director" means the _____ of the Department of _____.

Section 3. Certificate of Conformance

The Director may require any weight or measure, or any weighing or measuring instrument or device to be issued a Certificate of Conformance prior to use for commercial or law enforcement purposes.*

Section 4. Participating Laboratory

The Director is authorized to operate a Participating Laboratory as part of the National Type Evaluation Program. In this regard, the Director is authorized to charge and collect fees for type evaluation services.

Section 5. Revocation of Conflicting Regulations

All provisions of all orders and regulations heretofore issued on this same subject that are contrary to or inconsistent with the provisions of this regulation, and specifically _____, are hereby revoked.

Section 6. Effective Date

This regulation shall become effective on _____.

Given under my hand and the seal of my office in the City of _____ on this day of _____, 19__.

*See G-A.1., Section 1.14. General Code, National Bureau of Standards Handbook 44 for definition of commercial and law enforcement equipment.

(Item 201-1 was adopted.)

*201-1-2 DISCUSSION OF MODEL STATE REGULATION FOR NATIONAL TYPE EVALUATION

Section 1.

This model regulation will not pertain to all weighing and measuring devices and equipment, only to those covered in National Bureau of Standards Handbooks 44, 105-1, 105-2, and 105-3. Existing State program practices will continue to apply for devices not covered by Handbooks 44, 105-1, 105-2, and 105-3.

Sections 1., 2.1, and 2.5.

There is no reference to which version or edition of the handbooks will be used in type evaluation because the Certificate of Conformance will state the handbook edition under which the device is examined. Of course, the handbook used must be the version adopted by the NCWM at the time of submission for evaluation, not the version used by any individual State operating a Participating Laboratory.

Section 2.3.

The definition of the term "type" was developed and agreed to by the Specifications and Tolerances Committee and the Technical Committee on National Type Evaluation.

Section 3.

The model regulation would authorize the Director to accept an NTEP Certificate of Conformance as evidence of conformance; however, it is anticipated that certain devices in H-44 will not be issued a Certificate of Conformance. These devices fall into two categories:

- (1) Devices for which type evaluation criteria and checklists have not yet been developed or approved by the NCWM, for example, LPG devices. The number of devices in this category will diminish as type evaluation criteria continue to be developed.
- (2) Devices for which their manufacturers cannot afford to pay for an NTEP evaluation but which will meet H-44 requirements.

Both categories of devices will continue to be judged for their compliance with State laws in the manner in which States currently operate. States that do not have type evaluation programs of their own will evaluate devices when initially encountered in the field. States that have type evaluation programs will evaluate devices under their own program. The model regulation is not intended to transform States that do not operate type-evaluation programs into States that do, nor is it intended to transform a State that does not require type evaluations into a State that does - although Section 3 would authorize a State to require an NTEP Certificate of Conformance if the Director chooses to do so.

The question was raised at the Interim Meetings as to what procedures were to be followed if a device manufacturer wished to test market a device in an individual State. It was the consensus of opinion that this would be an occasion that is not covered by the regulation, and, as would be the case whether or not the regulation were adopted, should be addressed as a special request to the State wherein test marketing was contemplated. The device would be subject to whatever State requirements are deemed appropriate.

Sections 2.4. and 4.

NBS operates a program for certification of State Measurement Laboratory capability in mass, length, and volume. NBS will extend this certification program to State Measurement Laboratories desiring to operate as a "Participating Laboratory" under NTEP. Basic competences must be determined before certification is granted as is done in the areas of mass, length, and volume measurements. This program does not extend to private laboratories. The regulation is intended to apply whether or not an individual State wishes to operate a Participating Laboratory at the present time. It authorizes the State to do so (if it desires) at the present time, or in the future; it does not require the State to do so.

201-2 NAME CHANGE FROM "MODEL" TO "UNIFORM"

The Special Study Group that was formed to study feasible methods to permit adoption by citation of the model regulations contained in Handbook 130 has recommended that the titles of Handbook 130 and the model laws and regulations therein be changed from "Model" to "Uniform."

The Study Group feels that adoption by the States of the model laws and model regulations in Handbook 130 might receive a more favorable and speedy acceptance if the title of Handbook 130 was changed by substituting the word "uniform" for the word "model" in the title. The word "model" is intended to provide a guide for the States and thereby allow each State to utilize those portions of the model laws or regulations that best fit its requirements rather than simply adopting it in totality as a standard, which is what the word "uniform" might seem to imply. Lawyers, who after all are instrumental in bringing about the necessary adoption (inasmuch as the process of adoption is essentially a legal process), are relatively more comfortable through experience and training with a "uniform" law or regulation than with so-called "model" laws or regulations.

The Committee agrees that the term "model" connotes an ideal that may never be obtained in reality; whereas, the term "uniform" more nearly connotes a standard intended to be copied rather than used only as a guide.

It was pointed out to the Committee that municipal jurisdictions in many States may adopt additional requirements not already adopted by the State. Dropping the term "State" from the titles of Handbook 130 and the model laws and regulations would help this adoption process and would better reflect by the titles that other governmental subdivisions may adopt these models. The Committee concurs with this recommendation.

Therefore, the Committee recommends that the title of NBS Handbook 130 be changed to "Uniform Laws and Regulations." In addition, the Committee recommends changing the title of each law or regulation to:

- o Uniform Weights and Measures Law
- o Uniform Weighmaster Law
- o Uniform Packaging and Labeling Regulation
- o Uniform Regulation for the Method of Sale of Commodities
- o Uniform Unit Pricing Regulation
- o Uniform Regulation for the Voluntary Registration of Servicepersons and Service Agencies for Commercial Weighing and Measuring Devices
- o Uniform Open Dating Regulation

[Editor's note: "Model State Regulation for National Type Evaluation" will appear as "Uniform Regulation for National Type Evaluation."]

(Item 201-2 was adopted as part of the consent calendar.)

201-3 USE OF THE TERM "MASS" AND OF SI SYMBOLS

The U.S. Metric Association, Inc. (USMA) and others propose that the term "mass" replace all references to "weight" in H-130. In addition the term "volume" is proposed to replace "measure" and SI symbols to replace spelled-out names for the units in each model law or regulation.

The Committee is not prepared to make any of the suggested changes in any of the laws and regulations in H-130 for several reasons:

- (1) The term "weight", in commercial and everyday use, nearly always means "mass." The Committee cannot condone changing a well accepted part of government and law from "weights and measures" to "mass and measures", (or "mass and volume"), from "weighmaster" to "mass-master", or other similar changes in terminology.
- (2) In regard to the methods of sale of commodities and packaged goods, even though "mass" may be a more specific term, the purpose of labeling is not to educate the public but to inform them in terms they understand. In addition, the Congress of the U.S. and Federal agencies have established standards of labeling using the term "net weight" which cannot be overridden by State requirements.

- (3) The other parts of the USMA proposal, to use the SI symbols and to replace the term "measure" with "volume", is viewed by the Committee as simply editorial in nature. The Committee does not agree with the proposed changes: "measure container" is strictly defined in NBS Handbook 44; it is usually better to avoid accidents in typesetting by spelling out all terms and units; and "measure" can be length, area, dry volume, or liquid volume as necessary, not "volume" only.

(Item 201-3 was adopted as part of the consent calendar.)

*201-4 USE OF THE TERM "INTRASTATE" IN THE MODELS

The Special Study Group that was originally formed to study feasible methods to permit adoption by citation of the model regulations contained in H-130, at its October 13, 1982 meeting, initiated consideration of the "interstate" versus "intrastate" issue relating to variations resulting from exposure. The Committee at the 1982 National Conference had authorized the Study Group to examine this issue and to report its recommendations to the Committee.

Central to this issue are the phrases "entered intrastate commerce" and "introduced into intrastate commerce" which appear in Section 6.15. of the Model State Weights and Measures Law and in Section 12.1.2. of the Model State Packaging and Labeling Regulation. These phrases do not appear in the Federal regulations issued by the Food and Drug Administration or the U.S. Department of Agriculture and thus make the Model requirements inconsistent with Federal law and regulation. The continued use of the quoted phrases in the referenced models by the States in their enforcement activities that relate to variations resulting from exposure could result in undue burdens on interstate commerce.

The Study Group met in March 1983, to propose to the Committee language changes in the cited models to make them consistent with Federal law. A copy of the letter from the Study Group chairman to the Committee chairman appears on the next two pages.

The Committee has not had an opportunity to study these recommendations from the Study Group and therefore recommends carrying this item over until next year.

April 12, 1983

Mr. John Bartfai
Bureau of Weights and Measures
Building 7-A, State Campus
Albany, NY 12235

Dear Mr. Bartfai:

As you know, the Special Study Group or task force which you appointed to look into and report to your Committee on Laws and Regulations met at the National Bureau of Standards on March 21, 1983, to consider an issue which has long been of concern and interest to the National Conference on Weights and Measures (NCWM); namely, the interstate vs. intrastate issue relating to variations resulting from exposure.

After careful consideration of this important issue and its legal implications, including a thorough review of relevant court decisions, applicable Federal laws and regulations, and earlier discussions of the matter as reflected in talks presented at previous sessions of the NCWM, our task force consisting of Neil Magnus, Deputy Attorney General, Division of Law, State of New Jersey, Neal Peterson, attorney for General Mills, and myself, offer for your Committee's consideration and approval certain recommendations for changes in the current versions of the Model State Weights and Measures Law and the Model State Packaging and Labeling Regulation as set out in NBS Handbook 130, 1983 edition. These suggested changes are set out below and pertain to section 6.15 of the referenced Model Law and section 12.1.2 of the referenced Model Regulation.

It is our considered opinion that section 6.15 of the Model Law should be changed by deleting the words "only after the commodity has entered intrastate commerce." Thus, the section as changed would read as follows:

"6.15. Allow reasonable variations from the stated quantity of contents, which shall include those caused by loss or gain of moisture during the course of good distribution or by unavoidable deviations in good manufacturing practice."

It is our recommendation that section 12, "Variations to be Allowed", of the Model Regulation should be changed by deleting section 12.1.2 in its entirety and be replaced by the following language:

"12.1.2. Variations Resulting from Exposure. The statement of net quantity of contents as it is shown on a label shall not be false or misleading and shall express an accurate statement of the

quantity of the contents of the container exclusive of wrappers and packing substances. Reasonable variations caused by loss or gain of moisture during the course of good distribution practices or by unavoidable deviations in good manufacturing practice will be recognized. Variations from stated quantity of contents shall not be unreasonably large.

The language proposed for substitution of section 12.1.2 is taken from section 317.2(h)(2) of title 9 of the Code of Federal Regulations as published by the U.S. Department of Agriculture. Note that sections 12.1.1 and 12.2 of the Model Regulation remain unchanged.

I think it relevant to point out and even to emphasize that the changes being proposed are not intended and indeed do not in any way change, impede, or interfere with a State's lawful authority and duty to check and examine packages or commodities to ascertain compliance with applicable weights and measures laws and regulations. The changes are, however, intended to bring a State's weights and measures laws and regulations into compliance and be consistent with Federal laws and regulations.

As you know, those Federal laws and regulations have been upheld in decisions issued by the Supreme Court of the United States. Thus, the States must allow reasonable variations of the net contents of a package or commodity caused by loss or gain of moisture that may occur during the course of good distribution practices and must also recognize unavoidable deviations that may occur in good manufacturing practices.

I hope the recommendations of our task force are acceptable to you and your Committee. I ask that the Committee schedule consideration of this item when it informally meets prior to the opening session of the upcoming July 1983 National Conference on Weights and Measures. If the Committee accepts the recommendations as set out herein, I trust that it will seek their adoption by the NCSM, though I understand that it is not expected the Committee will do so at the forthcoming Conference. It need hardly be said that I and the other members of the task force stand ready to assist you and the Committee in any way that it is felt we may be helpful.

Sincerely,

Allen J. Farrar
Legal Adviser
National Bureau of Standards

202-1 ADOPTION OF MODEL REGULATIONS BY CITATION

(This item was carried over from the 67th NCWM, 1982, in which it was assigned voting key 201-1.)

At the 1980 annual meeting of the National Conference, the Laws and Regulations Committee was asked to explore a workable method of adoption by the States of Handbook 130 "Model State Laws and Regulations" by citation. Chairman John J. Bartfai asked Allen J. Farrar, Legal Adviser for the National Bureau of Standards, to select a special study group with representatives from State government and industry. Members of the group are Neil D. Magnus, Deputy Attorney General, Division of Law and Public Safety, State of New Jersey, and Neal D. Peterson, attorney for General Mills, Inc.

In 1981, the special study group distributed and then compiled the results from a questionnaire for State officials to determine current practices regarding adoption of model laws and regulations including NBS Handbook 44 (H-44). (See Final Report of Committee, Report of the 67th NCWM 1982, for survey results in detail.)

Of the 44 jurisdictions that responded to the survey, approximately 15-20 States permit incorporation of future amendments to H-44 by reference (see wording of Section 4 of Model State Weights and Measures Law.) These States automatically adopt updates to H-44 when changes are made to it by the NCWM. Seven States, however, reported problems with adopting regulations not yet in existence. It was not determined whether any of the remaining States had definite prohibitions against the wording contained in Section 4 of the Model Law ("The specifications ... as published in National Bureau of Standards Handbook 44 ... and supplements thereto or revisions thereof ...")

It appears that adoption by citation of H-44 is well accepted by almost all of the States, and many States also automatically update H-44. Handbook 130 (H-130) is a compilation of two model laws and five model regulations. Laws cannot be adopted by citation; the State legislative body must take action to pass a law. Regulations may, in general, be adopted by citation. Handbook 44 is a regulation adopted in all 50 States, most often by citation (rather than repeating or rewriting the entire handbook word for word in State regulations.)

The Committee recommends five additional sections be added to the Model State Weights and Measures Law in order to permit States to adopt the five model regulations contained in H-130 by citation and, when possible, to automatically update the regulations. The Committee recommends a separate section for each of the five model regulations contained in Handbook 130 not only because of the varying responsibilities of each weights and measures jurisdiction but also because of the varying needs for each model regulation in each State. For example, almost every State has adopted some version of the Model State

Packaging and Labeling Regulation, but only about seven States use the Model State Unit Pricing Regulation. (Of course, some States may not have the authority to adopt unit pricing regulations under their existing weights and measures laws.)

The Committee recommends the following sections be added to the Model State Weights and Measures Law (with existing Sections 5 through 22 to be renumbered):

SECTION 5. REQUIREMENTS FOR PACKAGING AND LABELING

The Model State Packaging and Labeling Regulation as adopted by the National Conference on Weights and Measures and published in the National Bureau of Standards' Handbook 130 "Model State Laws and Regulations" and supplements thereto or revisions thereof, shall apply to packaging and labeling in the State, except insofar as modified or rejected by regulation.

SECTION 6. REQUIREMENTS FOR THE METHOD OF SALE OF COMMODITIES

The Model State Regulation for the Method of Sale of Commodities as adopted by the National Conference on Weights and Measures and published in National Bureau of Standards' Handbook 130 "Model State Laws and Regulations" and supplements thereto or revisions thereof, shall apply to the method of sale of commodities in the State, except insofar as modified or rejected by regulation.

SECTION 7. REQUIREMENTS FOR UNIT PRICING

The Model State Unit Pricing Regulation as adopted by the National Conference on Weights and Measures and published in National Bureau of Standards' Handbook 130 "Model State Laws and Regulations" and supplements thereto or revisions thereof, shall apply to unit pricing in the State, except insofar as modified or rejected by regulation.

SECTION 8. REQUIREMENTS FOR THE REGISTRATION OF SERVICEPERSONS AND SERVICE AGENCIES FOR COMMERCIAL WEIGHING AND MEASURING DEVICES

The Model State Regulation for the Voluntary Registration of Servicepersons and Service Agencies for Commercial Weighing and Measuring Devices as adopted by the National Conference on Weights and Measures and published in National Bureau of Standards' Handbook 130 "Model State Laws and Regulations" and supplements thereto or revisions thereof, shall apply to the registration of servicepersons and service agencies in the State, except insofar as modified or rejected by regulation.

SECTION 9. REQUIREMENTS FOR OPEN DATING

The Model State Open Dating Regulation as adopted by the National Conference on Weights and Measures and published in National Bureau of Standards' Handbook 130 "Model State Laws and Regulations" and supplements thereto or revisions thereof, shall apply to open dating in the State, except insofar as modified or rejected by regulation.

The Committee further recommends (if the above sections are approved by the Conference) that the following letter be sent to each State Director of Weights and Measures by the Chairman of the NCWM. This letter explains the purpose of the new sections and sets out certain precautionary steps that should be taken by the States before the automatic update provisions of such sections are adopted:

State Director of Weights and Measures

Dear (each letter will be individually addressed):

At the recently concluded National Conference on Weights and Measures (NCWM), (insert date of Conference) the Conference formally adopted the recommendation proposed by the Committee on Laws and Regulations that five new sections be inserted into the Model State Weights and Measures Law (i.e., sections 5 through 9). The purpose of that action by the NCWM in approving the adoption of those new sections was to encourage and spur action by the States to adopt by citation and automatically update the model regulations set out in NBS Handbook 130, "Model State Laws and Regulations."

The language of the five new sections is set out below for your information and convenience. Before doing so, however, I believe it may be helpful to explain the reasons why the Committee on Laws and Regulations felt such action by the NCWM was desirable and the background that led to the Committee's recommendation.

At the 1980 annual convention of the NCWM, the Committee on Laws and Regulations was asked to explore a workable method of adoption by citation by the several States of the mentioned NBS Handbook 130 similar to the approach provided for NBS Handbook 44 in Section 4 of the Model State Weights and Measures Law. As this problem is largely a legal matter, a Study Group was established consisting of Allen J. Farrar, NBS Legal Adviser, Neil D. Magnus, Deputy Attorney General, Division of Law and Public Safety, State of New Jersey, and Neal D. Peterson, attorney for General Mills, Inc.

The Study Group, as a means of determining current practices regarding adoption of model laws and model regulations, developed a questionnaire which in March 1981 was mailed to the chief weights and measures

official of each State, the District of Columbia, Puerto Rico, and the Virgin Islands. An analysis was made of the responses and a report which summarized the results was made to the NCWM at its annual meeting in 1982. It was found that approximately 15 to 20 States automatically adopt the annual updates of NBS Handbook 44 as recommended by the NCWM and as set forth in Section 4 of the Model State Weights and Measures Law. We also discovered, however, that a number of States are prohibited, either by statute, State case law, or State constitution, from automatically adopting future amendments by citation - the issue has yet to be decided in the remaining States.

One of the recommendations that resulted from that survey was to develop new sections for insertion into the Model State Weights and Measures Law, which would facilitate the adoption by citation of the model regulations in NBS Handbook 130 by those States that had not done so and which would permit automatic updating of the model regulations by those States that can do so.

As the NCWM at its 1982 conference supported that approach, the Committee on Laws and Regulations, with input from its Study Group, presented its recommendations in the form of five new sections to be added to the Model State Weights and Measures Law, which recommendations as already indicated have been adopted by the NCWM. These new sections are as follows:

SECTION 5. REQUIREMENTS FOR PACKAGING AND LABELING

The Model State Packaging and Labeling Regulation as adopted by the National Conference on Weights and Measures and published in the National Bureau of Standards' Handbook 130 "Model State Laws and Regulations" and supplements thereto or revisions thereof, shall apply to packaging and labeling in the State, except insofar as modified or rejected by regulation.

SECTION 6. REQUIREMENTS FOR THE METHOD OF SALE OF COMMODITIES

The Model State Regulation for the Method of Sale of Commodities as adopted by the National Conference on Weights and Measures and published in National Bureau of Standards' Handbook 130 "Model State Laws and Regulations" and supplements thereto or revisions thereof, shall apply to the method of sale of commodities in the State, except insofar as modified or rejected by regulation.

SECTION 7. REQUIREMENTS FOR UNIT PRICING

The Model State Unit Pricing Regulation as adopted by the National Conference on Weights and Measures and published in National Bureau of Standards' Handbook 130 "Model State Laws and Regulations" and supplements thereto or revisions thereof, shall apply to unit pricing in the State, except insofar as modified or rejected by regulation.

SECTION 8. REQUIREMENTS FOR THE REGISTRATION OF SERVICEPERSONS AND SERVICE AGENCIES FOR COMMERCIAL WEIGHING AND MEASURING DEVICES

The Model State Regulation for the Voluntary Registration of Servicepersons and Service Agencies for Commercial Weighing and Measuring Devices as adopted by the National Conference on Weights and Measures and published in National Bureau of Standards' Handbook 130 "Model State Laws and Regulations" and supplements thereto or revisions thereof, shall apply to the registration of servicepersons and service agencies in the State, except insofar as modified or rejected by regulation.

SECTION 9. REQUIREMENTS FOR OPEN DATING

The Model State Open Dating Regulation as adopted by the National Conference on Weights and Measures and published in National Bureau of Standards' Handbook 130 "Model State Laws and Regulations" and supplements thereto or revisions thereof, shall apply to open dating in the State, except insofar as modified or rejected by regulation.

I would like to take this opportunity to encourage you to begin work to amend your State weights and measures law by adding the above sections to it. However, because of the differences in the various State laws revealed by our survey, I wish to advise you of certain precautionary steps you should take before you take action to have your State adopt these new sections. Each of the sections includes the phrase "and supplements thereto or revisions thereof" in referring to the particular regulation covered in that section. As previously mentioned, the responses to the referenced questionnaire and our own independent investigation indicate that some States may not lawfully enact a statute that provides for the automatic adoption of future supplements or revisions to the regulation that is covered by that statute (i.e., automatic update provisions). This prohibition may be the result of some other law that has been enacted by the State, State case law, or State constitution. On the other hand, some States may lawfully enact legislation that adopts by citation future amendments to a specified model regulation.

Therefore, it is essential that you consult with and obtain a written legal opinion from the Attorney General of your State on this matter. If you are advised in such opinion that your State may not lawfully enact a statute that provides for the automatic adoption of future supplements or revisions to the regulations covered by the statute, there are two options available to you. The first option is to seek to have the sections enacted without the phrase "and supplements thereto or revisions thereof." The other alternative is to substitute "as adopted, or amended and adopted, by rule of the Director" for the phrase "except insofar as modified or rejected by regulation." An

example of the latter change is set out below as a footnote* to this letter. No matter which option you select, it would be necessary to follow your State's administrative procedures to adopt a current version of each model regulation each time a supplement or revision thereto is made by the NCWM.

If, however, the legal opinion you receive advises that the inclusion of the phrase "and supplements thereto or revisions thereof" would be legally valid, we urge you to proceed to have those sections enacted as written in the Model State Weights and Measures Law.

It is hoped that your State will take prompt action to carry out the recommendation of the NCWM in adopting these five sections in a way that complies with the law in your particular State.

Sincerely,

Chairman of the NCWM

*SECTION 5. REQUIREMENTS FOR PACKAGING AND LABELING

The Model State Packaging and Labeling Regulation as adopted by the National Conference on Weights and Measures and published in the National Bureau of Standards' Handbook 130 "Model State Laws and Regulations" and supplements thereto or revisions thereof, shall apply to packaging and labeling in the State, as adopted, or amended and adopted, by rule of the Director.

Finally, the Committee recommends that the following paragraph be inserted into the background statement (p. III-3, H-130) to the Model State Weights and Measures Law and footnoted in Sections 4 through 9:

Sections 4 through 9 of the Model Law adopt NBS Handbook 44 and model regulations in NBS Handbook 130 by citation. In addition, these sections adopt supplements and revisions to Handbook 44 and the model regulations "except insofar as modified or rejected by regulation." Some States may not be able to lawfully enact a statute providing for automatic adoption of future supplements or revisions to a regulation covered by that statute. If this is determined to be the case in a given State, two alternatives are available:

- (a) Sections 4 through 9 may be enacted without the phrase..."and supplements thereto or revisions thereof..."*
- (b) Sections 4 through 9 may be enacted by replacing..."except insofar as modified or rejected by regulation..." with the phrase "as adopted, or amended and adopted, by rule of the Director."*

Either alternative requires action of the part of the Director to adopt a current version of Handbook 44 and each model regulation each time a supplement or revision is made by the National Conference on Weights and Measures.

(Item 202-1 was adopted.)

202-2 SECTION 12. SALE FROM BULK

(This item was carried over from the 67th NCWM, 1982, in which it was assigned a voting key of 202-1.)

In 1981, the Northwest and Western Weights and Measures Associations proposed different revisions to Section 12 in order to permit retail motor fuel deliveries to be sold without requiring a delivery ticket even though a single delivery can easily exceed \$20 as provided in the Model Law. One association proposed exempting retail motor fuel deliveries up to and including 30 gallons; the other association proposed raising the \$20 figure in Section 12 to \$100.

The Committee is opposed to raising the dollar value of sales for which a delivery ticket is required because other commodities (such as firewood) are delivered as a sale from bulk and Committee members feel the consumer deserves a receipt for delivery in these instances.

However, merely exempting motor fuel deliveries under 30 gallons is also inadequate because a delivery ticket with any other type of

purchase over \$20 would still be required--from a butcher (for example) when he or she weighs the product at the time of sale even though the process of weighing can be seen by the purchaser.

The futility of selecting an arbitrary dollar or volume amount to revise Section 12 was brought out in discussions with the National LP-Gas Association. A passenger vehicle can have a 47-gallon capacity fuel tank of LP-gas. If delivery ticket requirements were modified to apply to sales over 30 gallons, owners of vehicles running on LP-gas would be due delivery tickets but owners of passenger cars running on gasoline would not.

The Committee believes the main intent of the delivery ticket requirement is to protect the customer when he or she is not present to witness the measurement of product from bulk. (Of course, the customer always has the right to request a delivery ticket when he or she is present to witness the measurement.) Additional sections in model regulations have been recommended to cover specific products such as firewood and carcass meat, emphasizing the intent of Section 12 of the Model Law.

Additionally, the Committee believes regulations for specific types of sales from bulk appearing in both the Model State Method of Sale of Commodities and in other regulations (such as those covering bulk grain sales existing in certain States) should be referenced in the Model Law.

It was pointed out to the Committee that there is no reason to restrict the requirements (as presently written in Section 12) to transactions in which the quantity is determined only by the seller. There are many transactions for which the quantity is determined by the buyer (such as buying recycled paper or aluminum cans) and a delivery ticket is still appropriate.

The Committee therefore recommends the following revision:

Section 12. Sale From Bulk

~~Whenever the quantity is determined by the seller, all~~ bulk sales in excess of twenty dollars-(\$20) in which the buyer and seller are not both present to witness the measurement, and all bulk deliveries of heating fuel, and all other bulk sales specified by rule or regulation of the Director, shall be accompanied by a delivery ticket containing the following information:

- (a) The name and address of the ~~vendor~~ buyer and ~~purchaser~~ seller.
- (b) The date delivered.
- (c) The quantity delivered and the quantity upon which the price is based, if this differs from the delivered quantity.

- (d) The identity in the most descriptive terms commercially practicable, including any quality representation made in connection with the sale.
- (e) The count of individually wrapped packages, if more than one.

(Item 202-2 was adopted.)

*202-3 SECTION 6.13. (REFERENCE TO HANDBOOK 67)

The discussion below covers Section 6.13. of the Model State Weights and Measures Law and Section 12.2. of the Model State Packaging and Labeling Regulation (reference key 203-1).

Section 6.13. of the Model State Weights and Measures Law authorizes the Weights and Measures Director to "... employ recognized sampling procedures, such as are designated in the National Bureau of Standards Handbook 67, "Checking Prepackaged Commodities."

Section 12.2. of the Model State Packaging and Labeling Regulation states that "the magnitude of variations permitted ... shall be those expressly set forth in this regulation and those contained in the procedures and tables of the National Bureau of Standards Handbook 67, Checking Prepackaged Commodities."

There are two problems with these citations:

- (1) Many States do not use the table on page 8 of Handbook 67 "Unreasonable Minus or Plus Errors" referred to in Section 12.2. Most of the States that do not use this table use two tables developed by the Office of Weights and Measures in the late 1960's (see following tables). These two tables are not part of NBS Handbook 67.
- (2) NBS has published Handbook 133 to supersede Handbook 67. Although it will be several years before many States are prepared to use Handbook 133, there are several States that are using it now or planning to use Handbook 133 in the very near future.

The Committee is studying two proposals. The two proposals are:

- (a) Add references to Handbook 133 to both sections, i.e. "...in NBS Handbook 67 or Handbook 133..."

This approach will not solve the problem for those States that do not use the page 8 table in Handbook 67 referred to in Section 12.2 of the Model State Packaging and Labeling Regulation.

UNREASONABLE MINUS OR PLUS ERRORS

LABELED QUANTITY	MINUS ERROR GREATER THAN		PLUS ERROR GREATER THAN	
	POUNDS	OUNCES	POUNDS	OUNCES
0 TO 2 OUNCES	.008	$\frac{1}{8}$	.016	$\frac{1}{4}$
2+ TO 4 OUNCES	.012	$\frac{3}{16}$	.023	$\frac{3}{8}$
4+ TO 8 OUNCES	.016	$\frac{1}{4}$	.031	$\frac{1}{2}$
8 OUNCES + TO 1 POUND	.020	$\frac{5}{16}$	.039	$\frac{5}{8}$
1+ TO 2 POUNDS	.023	$\frac{3}{8}$	.047	$\frac{3}{4}$
2+ TO 3 POUNDS	.031	$\frac{1}{2}$	.063	1
3+ TO 4 POUNDS	.039	$\frac{5}{8}$	.079	$1\frac{1}{4}$
4+ TO 5 POUNDS	.047	$\frac{3}{4}$	.094	$1\frac{1}{2}$
5+ TO 6 POUNDS	.063	1	.125	2
6+ TO 7 POUNDS	.071	$1\frac{1}{8}$	.127	$2\frac{1}{4}$
7+ TO 8 POUNDS	.079	$1\frac{1}{4}$	.156	$2\frac{1}{2}$
8+ TO 9 POUNDS	.094	$1\frac{1}{2}$	.188	3
9+ TO 10 POUNDS	.110	$1\frac{3}{4}$	.219	$3\frac{1}{2}$
OVER 10 POUNDS	2% OF LABELED QUANTITY		4% OF LABELED QUANTITY	

UNREASONABLE MINUS OR PLUS ERRORS

LABELED QUANTITY	MINUS ERROR GREATER THAN		PLUS ERROR GREATER THAN	
	GRAM	ML	GRAM	ML
0 TO 2 FL OZ	1	3.7	2	7.4
2 + TO 4 FL OZ	1.5	5.5	3	11.1
4 + TO 8 FL OZ	2	7.4	4	14.8
8 FL OZ. + TO 1 PT	2.5	9.2	5	18.5
1 PT + TO 1 QT	3	11.1	6	22.2
1 + TO 1.5 QT	4	14.8	8	29.6
1.5 + TO 2 QT	5	18.5	10	37.0
2 + TO 2.5 QT	6	22.2	12	44.4
2.5 + TO 3 QT	8	29.6	16	59.2
3 + TO 3.5 QT	9	33.3	18	66.5
3.5 + TO 4 QT	10	37.0	20	73.9
4 + TO 4.5 QT	12	44.4	24	88.7
4.5 + TO 5 QT	15	55.5	30	110.9
ABOVE 5 QT	2% OF LABELED QUANTITY		4% OF LABELED QUANTITY	

- (b) Drop references to Handbook 67 in both sections, i.e. "...employ recognized sampling and testing procedures..." (Model Law) and "...magnitude of variations... contained in recognized sampling and testing procedures." (Model Regulation)

This approach may be too vague for purposes of enforcement and national uniformity.

The Committee welcomes opinions and advice on this issue. The Committee intends to carry over this item until next year.

203 MODEL STATE PACKAGING AND LABELING REGULATION

- *203-1 SECTION 12.2. MAGNITUDE OF PERMITTED VARIATIONS (REFERENCE TO HANDBOOK 67)

See reference key 202-3 for a complete discussion of this issue.

- *203-2 SECTIONS 6.7.1(d) PROVISIO and 6.7.2 PROVISIO (RANDOM PACKAGE QUANTITY DECLARATION)

Sections 6.7.1(d) proviso and 6.7.2 proviso limit the decimal fraction portion of the quantity statement in inch-pound units for a random package to two decimal places, e.g. "1.02 lb". (Quantity declarations in metric units for random packages are permitted decimal fractions to three places in order to provide equivalent accuracy with inch-pound declarations, i.e., 0.01 lb is approximately equivalent to 0.005 kg.)

Hobart Corporation proposes permitting decimal fractions of inch-pound units to be declared to three decimal places. They maintain that state-of-the-art weighing equipment has better accuracy and finer resolution than what was available when these sections were incorporated into the Model Regulation. Scales and printers are now available that display (and make labels with) inch-pound units to the third decimal place.

Members of the Committee see no difficulty, if a given scale or weighing system can meet all the requirements of NBS Handbook 44, with permitting random labels to be printed to three decimal places in pound units.

The problem arises because existing Food and Drug Administration (FDA), U.S. Department of Agriculture (USDA), and Federal Trade Commission (FTC) regulations specifically prohibit such labels.

It is doubtful that the specific packaged goods under the jurisdiction of the FTC would ever appear as random packages. However, FDA and USDA jurisdiction includes most of the commodities for which this type of weighing and labeling practice would be suitable, namely delicatessen and confectionary items.

Chapter 21 of the Code of Federal Regulations, Subsection 101.105(j)(2) covers random packages under FDA authority:

If the net quantity of contents declaration appears on a random package, that is a package which is one of a lot, shipment, or delivery of packages of the same consumer commodity with varying weights and with no fixed weight pattern, it may, when the net weight exceeds 1 pound, be expressed in terms of pounds and decimal fractions of the pound carried out to not more than two decimal places. When the net weight does not exceed 1 pound, the declaration on the random package may be in decimal fractions of the pound in lieu of ounces (see example in paragraph (m)(5) of this section.

Chapter 9 of the Code of Federal Regulations Subsection 317.2(h)(5) covers random packages under USDA authority:

On packages containing 1 pound or 1 pint and less than 4 pounds or 1 gallon, the statement shall be expressed as a dual declaration both in ounces and (immediately thereafter in parenthesis) in pounds, with any remainder in terms of ounces or common or decimal fraction of the pound, or in the case of liquid measure, in the largest whole units with any remainder in terms of fluid ounces or common or decimal fractions of the pint or quart, except that on random weight packages the statement shall be expressed in terms of pounds and decimal fractions of the pound carried out to not more than two decimal places, for packages over 1 pound, and for packages which do not exceed 1 pound the statement may be in decimal fractions of the pound in lieu of ounces.

The Committee endorses the proposal of the Hobart Corporation; however, further work with the USDA and FDA is necessary before a final recommendation can be made to the Conference. The Committee has written to the Food and Drug Administration and the U.S. Department of Agriculture concerning this issue. The Committee recommends holding this item over until next year.

203-3 SECTION 7. DECLARATION OF QUANTITY: NONCONSUMER PACKAGES (METRIC ONLY LABELS)

The American National Metric Council (ANMC) contacted the Committee concerning plans of the ANMC Chemical Sector to "go metric." This sector's packaged products are nonconsumer items such as industrial chemicals, solvents, cleaners, etc.

The questionnaire which follows was sent by the Committee to all 50 States, the District of Columbia, the Virgin Islands, and Puerto Rico.

As of the time of this report, 50 of 53 jurisdictions have responded to the questionnaire. A list of individual responses is included on the following pages.

A summary of the responses so far received indicates that

- (1) Only 4 States (of the 50 that responded) do not have a packaging and labeling regulation (P & L reg.). (See Nebraska, New Mexico, South Dakota and Wyoming.)
- (2) Of the 46 States that reported having a P & L reg., 43 of the regulations cover both consumer and nonconsumer packaged goods (see Massachusetts, Nevada, and Rhode Island in list).
- (3) Twenty-four jurisdictions have not adopted Sections 2.2 and 2.3 of the Model State Packaging and Labeling Regulation (MSPLR). Three States (California, North Carolina, and Tennessee) are in the process of adopting the model.
- (4) Thirty-four jurisdictions have not adopted Section 7.1 of the MSPLR. (California and Tennessee are proposing adoption of the model.)
- (5) Of the 34 that have not adopted Section 7.1, 6 do not permit voluntary use of metric-only labels on nonconsumer packages (see Florida, Georgia, Indiana, Missouri, New York and West Virginia in list.) New Jersey has not yet taken a position. Delaware would permit metric-only on export packages only. Louisiana would consider metric-only labels on a case-by-case basis, depending upon whether there is a general usage of metric only labeling in the particular areas in question. Wyoming would prefer both inch-pound and metric declarations.
- (6) Of the 16 States that have adopted Section 7.1, one State does not permit nonconsumer packages to have metric-only labels (see Colorado in list.)

The Committee thanks all jurisdictions for participating in this survey.

The survey may indicate that more thought needs to be devoted to the definition of nonconsumer packages. Nonconsumer packages may be classified in two categories: (a) packaged goods intended for use by businesses in the same way that consumers would use the products, e.g., cleaning agents, and other consumables; and (b) packaged goods intended for further processing into another product, e.g., industrial chemicals.

The Committee encourages States to update their packaging and labeling regulations and adopt Sections 2.2., 2.3., and 7.1. of the Model State Packaging and Labeling Regulation. Additionally, the Committee recommends that States permit metric-only labeling on nonconsumer packages.

The Committee would like to thank Cheryl Cummins, Vice President of ANMC, for her assistance in devising the survey and Jonathan Barnes, Office of Weights and Measures, NBS for his assistance in compiling the results of the survey.

(Item 203-3 was adopted as part of the consent calendar.)

National Conference on Weights and Measures
Metric Quantity Labeling Requirements for Nonconsumer Packages

BACKGROUND

- (1) The NCWM has recommended NBS Handbook 130 (1982) "Model State Laws & Regulations" for adoption by state and local weights and measures agencies.
- (2) Handbook 130 contains a Model State Packaging and Labeling Regulation.
- (3) The Model State Packaging and Labeling Regulation defines consumer packages and nonconsumer packages (Section 2).

2.2. CONSUMER PACKAGE: PACKAGE OF CONSUMER COMMODITY. -- A "consumer package" or "package of consumer commodity" shall be construed to mean a commodity in package form that is customarily produced or distributed for sale through retail sales agencies or instrumentalities for consumption by individuals or use by individuals for the purposes of personal care or in the performance of services ordinarily rendered in or about the household or in connection with personal possessions.

2.3. NONCONSUMER PACKAGE: PACKAGE OF NONCONSUMER COMMODITY. -- A "nonconsumer package" or "package of nonconsumer commodity" shall be construed to mean any commodity in package form other than a consumer package, and particularly a package intended solely for industrial or institutional use or for wholesale distribution.

- (4) The Model State Packaging and Labeling Regulation, would permit the declaration of quantity on nonconsumer packages (Section 7), to appear as metric-only labeling (providing federal law does not prohibit it).

7.1. GENERAL. -- The metric and inch-pound systems of weights and measures are recognized as proper systems to be used in the declaration of quantity. Units of both systems might be combined in a dual declaration of quantity.(1)

(1) Reminder: Although nonconsumer packages under this regulation might bear only metric declarations, this should not be construed to supersede any labeling requirement specified in Federal law.

- (5) For consumer packages the Federal Fair Packaging & Labeling Act provides for labeling in inch-pound units of measure. Metric units may also be declared and may even appear first. Labeling in inch-pound units is not required for nonconsumer packages in the Federal Fair Packaging & Labeling Act (this Act only covers consumer packages).
- (6) The Metric Conversion Act of 1975, P.L. 94-168, declares "a national policy of coordinating the increasing use of the metric system in the United States."

State

Agency

Person Responding
to Questionnaire

Address and
Telephone

NATIONAL CONFERENCE ON WEIGHTS AND MEASURES QUESTIONNAIRE ON
METRIC QUANTITY LABELING REQUIREMENTS FOR NONCONSUMER PACKAGES

1) Does your State have a Packaging and Labeling (or similar) Regulation?

YES _____ NO _____

2) Does your regulation cover both consumer and nonconsumer packaging?

YES _____ NO _____

3) Have you adopted Sections 2.2 and 2.3 of the Model State Regulation on Packaging and Labeling (Handbook 130, 1982), definitions of consumer and nonconsumer packages, into your State regulation?

YES _____ NO _____

4) Have you adopted Section 7.1 of the Model State Regulation on Packaging and Labeling (Handbook 130, 1982), the declaration of quantity on non-consumer packages to be either in metric or inch-pound units, into your State regulation?

YES _____ NO _____

(4a) If you answered yes to (4): do you permit nonconsumer packages to have metric-only labels?

YES _____ NO _____

(4b) If you answered no to (4): do you permit the voluntary use of metric-only labels on nonconsumer packages?

YES _____ NO _____

5) If you answered no to either 4a or 4b, what are the reasons for not permitting metric-only labels?

List of State Responses to Metric-Only Labeling Survey

State	Question Number:					
	1	2	3	4	4a	4b 5
Alabama	Yes	Yes	Yes	Yes	Yes	--
Alaska	Yes	Yes	No	No	--	Yes
Arizona	Yes	Yes	Yes	Yes	Yes	--
Arkansas	Yes	Yes	Yes	Yes	Yes	--
Notes:	4) see Circular 2 and 2A					
California	Yes	Yes	*	*	Yes	--
Notes:	*Proposed adoption of Model State Packaging and Labeling Regulation					
Colorado	Yes	Yes	Yes	Yes	No	No Regulations were adopted prior to the popularity of metric. We are in the process of changing to permit metric labeling.
Connecticut	Yes	Yes	Yes	No	--	Yes
Delaware	Yes	Yes	Yes	No	Yes	Yes
Notes:	4) but similar language has been adopted 4a) but only on export packages					
D.C.	Yes	Yes	No	No	--	Yes
Florida	Yes	Yes	Yes	No	--	No Florida's packaging and labeling Regulations still require the primary designation to be in the customary system.
Georgia	Yes	Yes	Yes	No	--	No There is a lack of knowledge of the metric system on the part of the public.
Hawaii	Yes	Yes	Yes	Yes	Yes	--
Notes:	1) 4-90 2) 4-90-5 (identity), 4-90-6 (responsibility), 4-90-7 (quantity) 4) 4-90-7 (consumer), 4-90-9 (non-consumer)					

Question Number:

State	1	2	3	4	4a	4b	5
Idaho	Yes	Yes	Yes				
Notes:	4) Our Regulation is not up-to-date with HB-130--but refer to Idaho Regulation section 4.5.12.2 and 4.6, non-consumer packages; also, State Code 71-229. 4a) We have not made that decision yet, because there has not been a specific situation. 5) When and if this situation arises, the State Attorney Generals Office would have to make a ruling. I (Lyman D. Holloway (Chief)) personally think our Laws and Regulations would permit metric-only labels.						
Illinois	Yes	Yes	Yes	Yes	Yes	--	
Indiana	Yes	Yes	No	No	--	No	To avoid purchaser confusion.
Iowa							
Kansas	Yes	Yes	No	No	--	Yes	
Notes:	5) We see no problem.						
Kentucky	Yes	Yes	No	No		Yes	
Louisiana	Yes	Yes	No	No	--	--	Would have to consider each situation on a case-by-case basis as to what purchaser of packaged product expect on label.
Maine	Yes	Yes	Yes	Yes	Yes	--	
Maryland	Yes	Yes	Yes	No	--	Yes	
Notes:	4) W & M Law permits either inch-pound or metric units to be used.						
Massachusetts	Yes		Yes	No	--	Yes	
Notes:	2) Yes and No -- for food in packaged form - relates to any package; for non-food item -- to packages sold at retail. Note: This is defined in Statute. 4) Our law would not prohibit a metric-only designation for a non-consumer package. 4a) In essence, our statute would not preclude non consumer package from having a metric-only label.						

State	Question Number:					
	1	2	3	4	4a	4b 5
Michigan	Yes	Yes	No	No	--	Yes
Notes:	3) These sections are in Michigan W & M law. 4) Presently promulgating regulation for adoption -- authority for metric-only sales are in Michigan W & M law since 1964 with clarification of this section of law in 1978.					
Minnesota	Yes	Yes	No	No	--	Yes
Mississippi	Yes	Yes	No	No	--	Yes
Missouri	Yes	Yes	No	No	--	No Consumer is still not knowledgeable enough of the metric system.
Montana	Yes	Yes	Yes (similar)	Yes	Yes	--
Nebraska	No	No	No	No	--	Yes
Notes:	Our W & M law is the only thing that would cover packaging. Handbook 67 also has some guidelines for what a package must contain.					
Nevada	Yes	No	No	No	--	Yes
Notes:	4) Statute permits inch-pound or metric units.					
New Hampshire	Yes	Yes	Yes	Yes	Yes	--
New Jersey	Yes	Yes	Yes	No		
Notes:	4) We plan to amend regulations to include this. 4b) We have not yet taken a position. 5) We have not been approached on the subject.					
New Mexico	No	No	No	No	--	Yes
New York	Yes	Yes	Yes	No	--	No Regulation requires dual declaration for both consumer and non-consumer packages.
North Carolina	Yes	Yes	No	No	--	Yes*
Notes:	1) We are in the process of adopting H-130. 2) per H-130. 3) & 4) (but pending). *4b) (We will).					
North Dakota	Yes	Yes	No	No	--	Yes

State	1	2	3	4	4a	4b	5
Ohio	Yes	Yes	No	No	--	Yes	
Notes:	3) We have adopted 1972 MSPLR: our State law, which supersedes the regulation, allows the use of metric-only labeling.						
Oklahoma	Yes	Yes	Yes	Yes	Yes	--	
	Question Number:						
Oregon	Yes	Yes	Yes	Yes	Yes	--	
Notes:	3) KJS NOTE OAR 603-27-115 sub. sect.(2) = 2.2, sect.(3) = 2.3 4) Earlier version that states "nothing in this section shall prohibit the labeling...in...units of the metric system."						
Pennsylvania	Yes	Yes	Yes	No	Yes	Yes	
Puerto Rico							
Rhode Island	Yes	No	Yes	No	--	Yes	
South Carolina	Yes	Yes	Yes	No	--	Yes	
Notes:	4) State Statutes allow the use of metric labeling.						
South Dakota	No	No	No	No	--	Yes	
Tennessee	Yes	Yes	*	*	Yes	--	
Notes:	*In the process of adopting Model State Packaging and Labeling Regulation.						
Texas	Yes	Yes	No	No	--	Yes	
Utah	Yes	Yes	Yes	Yes	Yes	--	
Vermont	Yes	Yes	Yes	Yes	Yes	--	
Virginia	Yes	Yes	Yes	Yes	Yes	--	
Virgin Islands							
Washington	Yes	Yes	Yes	Yes	Yes	Yes	
West Virginia	Yes	Yes	No	No	--	No	Confusion results and value comparisons made very difficult.

<u>State</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>4a</u>	<u>4b</u>	<u>5</u>
Wisconsin	Yes	Yes	No	No	--	Yes	
Notes:	4b)	Wisconsin	Stats	98.02			
Wyoming	No	Yes	No	No	--	Yes	
Notes:	2)	implied in State Law					
	4b)	prefer dual labeling on consumer and non-consumer packages.					

203-4 SECTION 10.9.5(b) SEWING THREADS, HANDICRAFTS, AND YARN

A consumer has requested that the net quantity statement for yarn be changed from weight to length. The proposal is based on her use of the product and her experience that darker colors often weigh more per unit of length. Therefore she has found that a lighter color yarn will "go farther" in her craft application than a darker yarn; she complains that she cannot predict how much yarn of varying colors to purchase based on a weight declaration. The Committee is sympathetic to the request but must support existing labeling requirements for several reasons.

Yarn is by nature extremely stretchy; in order to label yarn by length, a specified tension would have to be applied in order to make any repeatable length measurement. Such a tension would have to be agreed upon by all the manufacturers of yarn, and would have to be applied in any compliance testing of product by weights and measures officials. Even if this tension "standard" were negotiated and decided upon, it would have little real meaning in use by needle-crafters, knitters, and others. The tension applied to yarn in use varies from user to user and from application to application; therefore, the length also varies. Not only does dyeing yarn change the weight, dyeing also changes the length of yarn. For these reasons, industry representatives also support the requirements as they presently are written in the Model State Packaging and Labeling Regulation.

The Committee recognizes the difficulty of working with this product and suggests that users of yarn consider buying an excess of the yarn over what is expected to be used in any application, and find out before purchase if, after finishing the product, they can return the unopened skeins to the retailers from whom the skeins were purchased.

(Item 203-4 was adopted as part of the consent calendar.)

203-5 BAKERY PRODUCTS: VARIATIONS FROM DECLARED NET WEIGHTS

(This item was carried over from the 67th NCWM, 1982, in which it was assigned a voting key of 203-3).

The American Bakers Association (ABA) proposed the need for special individual package variations for bakery products. They argue that neither the permitted variations in Handbook 67 ("Unreasonable Minus or Plus Errors") or in Handbook 133 ("Maximum Allowable Variations") are large enough for the special quality control problems prevalent in their industry. The Committee requested specific data from the ABA that would support their proposal and agreed to work with the Office of Weights and Measures and the ABA in order to determine if special limits of reasonable variation should be set for bakery products.

The ABA supplied data from 185 lots, from 5 companies, of several types of product (biscuits, buns, bread, donuts, cakes, pies, etc.) with net weight declarations from 2 1/4 to 30 oz. The data for each product

produced by each plant consisted of about 50 individual package net weights taken at intervals of 10 min to 1/2 h spaced throughout a production run (one day's run). Other data were supplied on a few products for which 10 packages coming consecutively off the production line were collected at hourly intervals and weighed.

Both sets of data indicated very great variability in net weight for any given product.

Having reviewed the data submitted to the Committee by their member companies, the ABA requested a tentative figure of twice the maximum allowable variations as described in Handbook-133.

Two Weights and Measures jurisdictions provided copies of recent package test reports on bakery products. One jurisdiction tested these products using Handbook 67 (H-67) and the other using Handbook 133 (H-133).

In the jurisdiction using H-67, 148 samples were taken, (mostly at retail), with only seven lots rejected on the basis of the sample data (4.7%); the lots that were rejected failed the average requirements as well as the allowable number of individual packages with "unreasonable minus errors." However, four more lots would have failed if H-67 had been followed to the letter; four more lots had at least two packages in a sample of 10 that exceeded the table values of unreasonable minus errors in H-67. Since the particular jurisdiction that provided these data uses the tables shown in reference key 202-3 rather than H-67, only one lot in addition to the seven that were rejected should have been rejected on the basis of the sample data (5.4% rejected). The variability in each sample was large; however, because the bakers had overpacked to the extent necessary to account for such variability, 94.6% of the lots complied with the requirements.

In the jurisdiction using H-133, 15 samples from different types of baked goods were analyzed; 4 were rejected based on the fact that the average error was minus and only one was rejected on both the average being minus and on individual packages exceeding the MAV. Again, some of the data showed wide variability in individual package weights from the same lot; however the bakeries had accommodated the variability by setting their targets higher than the label.

Although baked goods do show large variability, the data provided to the Committee plus the personal experience of the Committee members indicate that there are no serious compliance problems with such packaged goods. Although permitting larger individual package variations would permit some bakeries to decrease their target weights, the Committee wishes to see the status quo maintained. Members of the Committee are convinced that packagers producing baked goods are able to meet the existing standards and that those standards are adequate and not in need of changing. Based on this information, the Committee therefore recommends no addition to either the Model State Packaging and Labeling Regulation or to H-67 or H-133 for bakery products.

(Item 203-5 was adopted as part of the consent calendar.)

203-6 NONWOVEN SYNTHETIC SCOURING PADS: VARIATIONS FROM DECLARED
NET QUANTITIES

(This item was carried over from the 67th NCWM, 1982, in which it was assigned a voting key of 203-2.)

3M requests a withdrawal of its proposal for individual package variations of 2 percent from declared dimensions for non-woven synthetic scouring pads, because improvements in process and product quantity control have reduced the variability in 3M's scouring pads. The Committee recommends no further action on this item.

(Item 203-6 was adopted as part of the consent calendar.)

204 MODEL STATE REGULATION FOR THE METHOD OF SALE OF COMMODITIES

*204-1 SURVEY ON STATE ADOPTION OF THE MODEL REGULATION

A review of the Model State Regulation for the Method of Sale of Commodities was undertaken by the Committee as part of its long range work plan.

The Committee selected this Model because of the large number of proposals and requests that are submitted each year for changes to this Model.

The first step in this review was to intercompare the model with existing State requirements. The committee's technical advisor was asked to make this intercomparison. The Committee requested all State Weights and Measures officials as well as those representing the District of Columbia, the Virgin Islands, and Puerto Rico to review this material and submit any corrections including proper citations to the Committee before the annual meeting in July, 1983.

In view of the interest shown this Model by the Conference, the extent of nonuniformity of adoption by the States may be surprising. Fewer than ten States have adopted more than 50% of the Model. Only three States (Maine, New Hampshire, and Vermont) automatically update their method of sale requirements as the NCWM recommends changes.

It is the opinion of the members of the Committee that this compilation indicates:

- (a) the value of adoption of the models by citation by the States, (see reference key 202-1) and,
- (b) that the States and the National Conference should review and reach a consensus on the continuing need for large sections of the Model.

The Committee recommends carrying this item over for further work next year.

Intercomparison of State Requirements
with the Model State Regulation for the
Method of Sale of Commodities

by C. S. Brickenkamp and Paula Boelke.¹

The Office of Weights and Measures has intercompared the State weights and measures laws and regulations with the Model State Regulation for the Method of Sale of Commodities, 1982 version. Methods of sale had been contained in the model law at one time; therefore, State weights and measures laws were searched as well as their regulations. The compilation appears on the following pages.

¹Physical Science Aide, Office of Weights and Measures, National Bureau of Standards.

Key to the following tables:

+: Has adopted this Section of the Model
-: Has modified this Section
pt: Has adopted part of Section
blank: Has not adopted this Section

State	1.1 (a)	1.1 (b)	1.2 (a)	1.2 (b)	1.3 (a)	1.3 (b)	1.4 (a)	1.4 (b)	1.5 (a)	1.5 (b)	1.6 (a)	1.6 (b)	1.7 (a)	1.7 (b)	1.7 (c)	1.8	1.9	1.10
Alabama	+	+	+	+	+	+	+	+	pt	+	+	+	+	+	+	+		
Alaska	+	+	-	+	+	+	+	+	pt	+	+	+	+	+	+	+		
Arizona	+	+	+	+	+	+	+	+	+	+	+	+	+	+	pt	+		
Arkansas	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
California	+	-	+	+	+	+	+	+	pt	pt	+	+	+	+	+	+		
Colorado	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Connecticut	+	+	+	+	+	+	+	+	pt	+	+	+	+	+	+	+		
Delaware	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
District of Columbia	+	+	+	+	+	+	+	+	pt	+	+	+	+	+	+	+		
Florida	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Georgia	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Hawaii	pt	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Idaho	+	+	pt	+	+	+	+	+	+	+	+	+	+	+	+	+		
Illinois	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+		
Indiana	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Iowa	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Kansas	+	+	+	+	+	+	+	+	pt	+	+	+	+	+	+	+		
Kentucky	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Louisiana	+	+	+	+	+	+	+	+	pt	+	+	+	+	+	+	+		
Maine	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Maryland	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Massachusetts	+	+	+	+	+	+	+	+	pt	+	+	+	+	+	+	+		

State	1.11	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(a)	(b)	(c)	(a)	(b)	(c)	(d)	(e)	(f)	2.4	2.4.1
Alabama	+	+	+	+	+	+	+	+	+													pt	+
Alaska																+						+	+
Arizona																+						+	+
Arkansas																							
California																			+				
Colorado																+			+	+	+	+	+
Connecticut																+			+	+	+	+	+
Delaware																+			+	+	+	+	+
District of Columbia																							
Florida																							
Georgia																+						+	+
Hawaii	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Idaho																							
Illinois																							
Indiana																							
Iowa																							
Kansas																							
Kentucky	+		+						+							+						+	+
Louisiana																							
Maine	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Maryland																+	+	+	+	+	-	+	+
Massachusetts																+	+	+	+	+	+	+	+

State	2.4.2.1	(a)	(b)	2.4.2.2	(a)	(b)	2.5	(a)	(b)	(c)	2.6	2.6.1.1	2.6.1.2	2.6.1.3	2.6.2	2.6.2.1	2.6.2.2	2.7	2.8.1	2.8.2.1	2.8.2.2	2.8.2.3	2.8.2.4	2.8.2.5	2.8.3	(a)	(b)	(c)	2.9	2.9.1.1	
Alabama	+	+	+	+	pt	+	+	+	+	+	pt	+	+	+	+	+	pt	pt												+	+
Alaska	+	-	+	+	pt	+	+	+	+	+	pt	+	+	+	+	+	pt	pt	pt	pt	pt	pt	pt	pt	pt	pt	pt	pt	pt	+	+
Arizona	+	+	pt	+	+	+	+	+	+	+	pt	+	+	+	+	+	pt	pt	pt	pt	pt	pt	pt	pt	pt	pt	pt	pt	pt	+	+
Arkansas																															
California																															
Colorado	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	pt	pt	+	+	+	+	+	+	+	+	+	+	+	+
Connecticut																															
Delaware																															
District of Columbia																															
Florida																															
Georgia	+	+	+	+	pt	+	+	+	+	+	pt	+	+	+	+	+	+	pt	pt	+	+	+	+	+	+	+	+	+	+	+	+
Hawaii	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	pt	pt	+	+	+	+	+	+	+	+	+	+	+	+
Idaho																															
Illinois													+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Indiana																															
Iowa																															
Kansas																															
Kentucky	+	+	+	+	pt	+	+	+	+	+	pt	+	+	+	+	+	+	pt	pt	+	+	+	+	+	+	+	+	+	+	+	+
Louisiana																															
Maine	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Maryland	+	-	+	+	pt	+	+	+	+	+	pt	+	+	+	+	+	+	pt	pt	+	+	+	+	+	+	+	+	pt	+	+	+
Massachusetts																															

State	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Alabama																				
Alaska																				
Arizona																				
Arkansas																				
California																				
Colorado																				
Connecticut																				
Delaware																				
District of Columbia																				
Florida																				
Georgia																				
Hawaii																				
Idaho																				
Illinois																				
Indiana																				
Iowa																				
Kansas																				
Kentucky																				
Louisiana																				
Maine																				
Maryland																				
Massachusetts																				
2.9.1.2	-	+																		
2.9.1.3	-	+																		
2.9.1.4	pt	+																		
2.9.1.5	+	+																		
2.9.1.6	+	+																		
2.9.1.7	+	+																		
2.9.1.8	+	+																		
2.9.1.9		+																		
2.9.1.10		+																		
2.9.1.11			+																	
2.9.1.12		+	+																	
2.9.1.13	+	+																		
2.9.2	+	+	+																	
2.9.3	+	+	+																	
(a)																				
(b)																				
TABLE 1	+	+																		
NOTE 1	+	+																		
NOTE 2	+	+																		
2.10	(a)	(b)	(c)	(d)	(e)															
2.12.1	(a)	(b)	(c)	(d)	(e)															
2.12.2	(a)	(b)	(c)	(d)	(e)															

<u>State</u>	3.4	3.4.1	3.4.2	(a)(1)	(2)	(3)	(b)(1)	(2)	(3)	3.4.3	3.4.4	3.4.5	(a)	(b)	4.	5.
Alabama	+	+	+	+	+	+	+			+		+	+	+		+
Alaska																
Arizona	+	+	+	+	+	+	-	-	-	+	+					
Arkansas																
California																
Colorado	+	+	+	+	+	+	+	+	+	+		+	+	+		
Connecticut																
Delaware																
District of Columbia																
Florida																
Georgia																
Hawaii																
Idaho															+	
Illinois																
Indiana																
Iowa																
Kansas																
Kentucky	+	pt	+	+	+	+				+	+	+	+	+		
Louisiana																
Maine		+	+	+	+	+	+	+	+	+	+	+	+	+		
Maryland	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+
Massachusetts																

<u>State</u>	<u>Citations to State Laws and Regulations</u>
Alabama	Weights and Measures Regulation No. 2 (1980), 4 (1981).
Alaska	Alaska Statutes Chap. 75, "Weights and Measures Act"; Alaska Administrative Code, Chap. 3, Section 34 (1974).
Arizona	Weights and Measures Rules & Regulations, Articles 3 & 4 (1975).
Arkansas	Circular 2-A, Reg. 1, 2, 3 (1969).
California	California Administrative Code, Title 4, Chap. 8, Sub. 3; Chap. 9, Subchapter 10 (1983).
Colorado	"Measure and Standards Act," Colorado Revised Statutes 1973, 35-14-114 to 35-14-129 (1981).
Connecticut	General Statutes, Revision of 1958, Title 43, Chap. 752, Weights and Measures (1981).
Delaware	State of Delaware Code, Title 6, Chap. 51 (1974); Title 16, Chap. 41 (1961); Regulation No. 2 (1962).
District of Columbia	Standard Weights and Measures Laws and Regulations (1973).
Florida	
Georgia	Weights and Measures Rules & Regulations 40-15-3 to 40-15-6, also 40-7-4 (1973).
Hawaii	Hawaii Administrative Code, Title 4, Sub. 7, Chap. 92 (1982).
Idaho	Idaho Code, Title 71 - Weights and Measures (1969), Regulations for Weights and Measures, Part 4, 5, 6, 8 (1972).
Illinois	Laws and Rules and Regulations "Illinois Weights and Measures Act of 1963," Illinois Rev. Stat: Chap. 147 (1981).
Indiana	"Laws Governing Weights and Measures," Indiana Code, Title 16, Article 6, Chap 2 and 8 (1978).
Iowa	Code of Iowa, Chap. 210, 212 (1981).
Kansas	Kansas Statutes 83-101 thru 83-154, "Weights and Measures Laws" (undated).

StateCitations

Kentucky	Weights and Measures Regulations, "Method of Sale," Kentucky Administrative Regulations, Title 302, Chap. 76 (undated). Most recent paragraph added (1975).
Louisiana	Louisiana Revised Statutes of 1950, Title 55; Weights and Measures Regulations No. 2, 3, 4, 5, 6 (undated).
Maine	Maine Revised Statutes 1964, Title 10 (1979). (Automatic adoption of model.)
Maryland	Annotated Code of Maryland, Title 11, Subtitle 3, (1981). Maryland Department of Agriculture (Regulations) Title 15, Subtitle 3, Chapter 3 (undated).
Massachusetts	General Laws of Massachusetts, Chap. 94 (1979).

<u>State</u>	<u>Other Methods of Sale Not Included in Model That Are State Requirements</u>
AL	Actual and declared capacities; dimensions of toilet tissue; paper towels; napkins and facial tissues; weights per bushel, barrel for agricultural commodities.
AK	Furnace and stove oil; coal; coke and charcoal; textile products.
AR	Fruits and vegetables; paper products.
AZ	Paper plates; vehicle fluids; ice; hay; coal, coke, charcoal; fruits and vegetables; additional polyethylene products; metric softwood lumber.
CA	Textiles; soap allowances; produce; minerals; brick; stone; water; live fish for stocking purposes; baler and binder twine; paper and plastic cups; paper plates; sanitary paper products.
CT	Weights per bushel, barrel; charcoal; flour; potatoes; heated petroleum; bulk grains; feedstuffs; sand and gravel; saw logs; thread; additional information for liquid petroleum gas cylinders.
DE	Textile products; twine and cordage, weight of a gallon of ice cream; furnace and stove oil; variations from net weight for bread.
DC	Coal, charcoal and coke; ice; oysters.
FL	
GA	Bagged coal; weights per bushel; additional requirements for roofing; polyethylene and polyolefin sheeting; bark and hull mulches.
HI	Aburage; canned abalone or concholepas; Christmas trees; liquid fuel products; petroleum; honey; konnyaku; roofing; lettuce; nuts; Nori; media for planting.
ID	Liquid petroleum gas; petroleum products; polyethylene sold from bulk.
IL	Coal; heating and cooking oil; standard of fill for nuts; advertising and sale of petroleum products; standard weights per bushel for agricultural commodities.
IN	Weights per bushel; lime; coal; charcoal; standard weights of commodities in barrels, gallons.
IA	Weights per bushel, perch of stone; fruit and vegetables in climax baskets; regular/premium grades of gas; saw logs.
KS	Ice cream weight per gallon; fruit and vegetables in climax baskets; liquified petroleum gas; weights per bushel for certain commodities.
KY	Paper plates; sanitary paper products; weights and measures; bulk commodities; fuel oil.
LA	Tolerances for bakery items and fluid packages; fish; shrimp; oysters; cotton; live and dressed poultry.
ME	Wood: weight scale, butt scale, log rule, volume scale; wrapped paper rolls; sheeted paper; wrapped bundles of paper; herring; "loose cord."
MD	Liquid fuels; ice.
MA	Fish; kindling wood; thread; fuel oils; coke, coal and charcoal; cranberries; ice; grain and meal; feeding stuff; hay; seed; nails.

State	1.1 (a)	1.2 (a)	1.3 (a)	1.4 (a)	1.5 (a)	1.6 (a)	1.7 (a)	1.8 (a)	1.9 (a)
Michigan		+	-	+	+	+	+		
Minnesota	(no method of sale requirements)								
Mississippi	+	+	pt	+	+	+	+	+	+
Missouri					pt				
Montana	+	+	+	+	+	+	+	+	+
Nebraska	(no method of sale requirements)								
Nevada	+	+	+	+	+	+	+	+	+
New Hampshire	+	+	+	+	+	+	+	+	+
New Jersey					pt				
New Mexico	+	+	+	+	+	+	+	+	+
New York	+	+	+	+	+	+	+	+	+
North Carolina	+	+	+	+	+	+	+	+	+
North Dakota									
Ohio	+								
Oklahoma									
Oregon	+	+		+	+	+	+	+	+
Pennsylvania	+	+	+	+	+	+	+	+	+
Puerto Rico		+							
Rhode Island									
S. Carolina	+	+	+	+	+	+	+	+	+
South Dakota	(no method of sale requirements)								
Tennessee	+		+	+	+	+	+	+	+
Texas		pt	+	+					

State	1.11	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(a)	(b)	(c)	2.2	2.3	2.3.1.1	2.3.1.2	2.3.1.3	2.3.2	2.3.3	2.3.4	2.3.5	(a)	(b)	(c)	(d)	(e)	(f)	2.4	2.4.1		
Michigan			-		-	+	+	+	+	+	-	+							+															
Minnesota																																		
Mississippi																																		
Missouri	+	+	+	+	+	+	+	+	+	+	+	+	+									pt			+	+	+							
Montana	+								+										+															
Nebraska																																		
Nevada																			+															
New Hampshire	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
New Jersey	+	+	+	+	+	+	+	+	+									+	+					+	+	+	+	+	+	+	+	+	+	
New Mexico																		+	+			pt		+	+	+	+	+	+	+	+	+	+	
New York	+	+	+	+	+	+	+	+	+	+	+	+	+					pt	pt			pt		+	+	+	+	+	+	+	+	+	+	
North Carolina	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	
North Dakota																		+	+															
Ohio																																		
Oklahoma																								+	+	+	+	+	+	+	+	+	+	
Oregon																																		
Pennsylvania	+	+	+	+	+	+	+	+	+	+	+	+	+					+	+	+	+	+	+	+	+	pt	+	+	+	+	+	+	+	
Puerto Rico																		+	+															
Rhode Island																																		
S. Carolina																		+	+															
S. Dakota																																		
Tennessee																																		
Texas																																		

State	(a)	(b)	(a)	(b)	(a)	(b)	(c)	(a)	(b)	(c)	(a)	(b)	(c)	(a)	(b)	(c)	(a)	(b)	(c)	(a)	(b)	(c)	(a)	(b)	(c)
Michigan	2.4, 2.1																								
Minnesota																									
Mississippi																									
Missouri																									
Montana																									
Nebraska																									
Nevada																									
New Hampshire																									
New Jersey																									
New Mexico																									
New York																									
North Carolina																									
North Dakota																									
Ohio																									
Oklahoma																									
Oregon																									
Pennsylvania																									
Puerto Rico																									
Rhode Island																									
South Carolina																									
South Dakota																									
Tennessee																									
Texas																									

State	2.9.1.2	2.9.1.3	2.9.1.4	2.9.1.5	2.9.1.6	2.9.1.7	2.9.1.8	2.9.1.9	2.9.1.10	2.9.1.11	2.9.1.12	2.9.1.13	2.9.2	2.9.3	(a)	(b)	(c)	(d)	(e)	2.12.1	(a)	(b)	(c)	(a)	(b)	2.12.2	(a)	(b)
Michigan																												
Minnesota																												
Mississippi																												
Montana																												
Nebraska																												
Nevada																												
New Hampshire	+																								+			
New Jersey																									+			
New Mexico																												
New York																									+			
North Carolina	-																								+			
North Dakota																									+			
Ohio																												
Oklahoma																												
Oregon																												
Pennsylvania																												
Puerto Rico																												
Rhode Island																												
South Carolina																												
South Dakota																												
Tennessee																												
Texas																												

State	2.12.3 (a)	2.12.3 (b)	2.12.3 (c)	2.12.4 (a)	2.12.4 (b)	2.12.5 (a)	2.12.5 (b)	2.12.5 (c)	2.12.5 (d)	2.12.6 (a)	2.12.6 (b)	2.12.6 (c)	2.12.6 (d)	2.13.1	2.13.2	2.13.3	2.14	2.15	2.15.1	2.15.2	3.1	3.2	3.2.1(a)(1)	3.2.1(b)(1)	(2)	(2) 3.3	(a)	(b)	(c)
Michigan																													
Minnesota																													
Mississippi																													
Missouri																													
Montana																													
Nebraska																													
Nevada																													
New Hampshire	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
New Jersey																													
New Mexico																													
New York	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
North Carolina	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
North Dakota																													
Ohio																													
Oklahoma																													
Oregon																													
Pennsylvania																													
Puerto Rico																													
Rhode Island																													
South Carolina																													
South Dakota																													
Tennessee																													
Texas																													

State	3.4	3.4.1	3.4.2	(a)(1)	(2)	(3)	(b)(1)	(2)	(3)	(a)	(b)	4.	5.
Michigan													
Minnesota													
Mississippi													
Missouri													
Montana													
Nebraska													
Nevada													
New Hampshire	+	+	+	+	+	+	+	+	+	+	+	+	+
New Jersey													
New Mexico													+
New York													
North Carolina	+	+	+	+	+	+	+	+	+	+	+		
North Dakota													
Ohio													
Oklahoma													
Oregon	+	pt	+	+	+	+			+				
Pennsylvania													
Puerto Rico													
Rhode Island													
South Carolina													
South Dakota													
Tennessee													
Texas													

<u>State</u>	<u>Other Methods of Sale Not Included in Model That Are State Requirements</u>
MI	Sale of cherries; oleo or margarine; bread pan sizes; weights per bushel; buckwheat flour.
MN	
MS	Paper napkins; paper towels; writing paper; wrapping paper; facial tissues; toilet tissues.
MO	Bread.
MT	Use of metric; additional requirements for paint; liquid petroleum gas; fuel oil; furnace and stove oil; gasoline, diesel and kerosene.
NE	
NV	Sale of liquified petroleum gas; false bottoms, sides, lids and deceptive construction prohibited on containers, firewood by "loose cord" or "standard load"; 3 quart dairy products; 1 1/2 lb butter and margarine; petroleum products; antifreeze.
NH	Furnace and stove oil; packages sold by count; ice.
NJ	Holiday decorating materials; box lunches; weights per bushel for various commodities; dried, smoked fish; shellfish; standard containers for farm products; sectioned poultry; paper products; fresh fruits, vegetables.
NM	Liquid feed for livestock by weight or liquid measure; fuel wood by weight if equivalent price per cord and unit price is provided; pan size requirements for bread.
NY	Petroleum products; bulk sale of coal/coke; gasoline; cherries; beer, ale, port; hay or straw; standard log rule; lawn dressings and fertilizers; deli-products.
NC	Weights per bushel for various commodities; standard loaves of bread.
ND	Weights per bushel for various commodities; standard measure of wood; standard weight of coal, charcoal; ice, perch of stone.
OH	Commercial fertilizers; liming materials; feedstuffs; eggs; maple syrup; frozen desserts; oils and paints; seeds; containers for fruits and vegetables.
OK	Weights per bushel for various commodities; weighing of cotton, "ton of hay" defined; "perch" of mason work defined.
OR	Ice; sawdust; wood particles; liquid petroleum gas and liquid fuels.
PA	Paper products; produce; liquified petroleum gases; random weight packaged meats; bulk meat identity; potatoes; fruits and vegetables; solid fuel.
PR	Tolerances for loaves of bread; construction materials; roofing; steel mesh; octane rating of gasoline.
RI	Grain; salt; weights per bushel, dimensions of bushel; cotton; neat-cattle; charcoal; fish; hay and straw, thread; lumber; salted meats; apples; fruits and vegetables.
SC	Weights per bushel; tobacco baskets; agricultural seed; petroleum products.
SD	
TN	Flour and corn meal exceptions; coal, coke, and charcoal; paper products.
TX	

StateCitations to State Laws and Regulations

Michigan	Michigan Compiled Laws, Weights and Measures Act of 1964, Act No. 283, Public Acts of 1964, as amended (1978), Weight per bushel of grain, etc., Act No. 223, Public Acts of 1863 (1925); Oleo or Margarine, Act No. 63, Public Acts of 1913, as amended, (1980); Standard Bread Pan Law, Act No. 317, Public Acts of 1941, as amended (1975); Buckwheat Flour, Act 208 of Public Acts of 1903 (1963); Primal Cut and Carcass Weight Meat Law Act No. 315 of Public Acts of 1972, as amended (1972); Michigan Administrative Code, Regulation No. 548 (R 285.548) "Sale of Cherries Suspended in Liquid" as amended (1973).
Minnesota	
Mississippi	Regulations No. 2, 3, 4, 5, 6, 7, 8, 11 in "Rules and Regulations for the Enforcement of the Mississippi Weights and Measures Law, Chapter 221, Laws of 1964" (1964).
Missouri	Code of State Regulations, Title 2, 90-20 (1978).
Montana	Montana Code Annotated, Title 30, Chap. 12; Administrative Rules of Montana 8.5.302 (1980); 8.77.201 (12) (1979).
Nebraska	
Nevada	Nevada Revised Statutes, Chapters 581 and 590 (1981).
New Hampshire	New Hampshire Revised Statutes Annotated 359-A as inserted by 1969, 457:2, "Weights and Measures Act" (1969), Regulation 4 and 5 (1973). (Automatic adoption of model.)
New Jersey	New Jersey Administrative Code, Department of Law and Public Safety, "Weights and Measures Rules," Title 13, Subtitle I (1973 with revisions to 1982.)
New Mexico	Regulatory Order of the Board of Regents of New Mexico State University, No. 5, (1975); Regulatory Order No. 10, (1975).
New York	Agriculture and Markets Law, Article 16 as quoted in the Bureau of Weights and Measures Circular 904 (revised 1977); New York Codes, Rules, and Regulations, Chapter V, Weights and Measures (1978).
North Carolina	North Carolina General Statutes, Chap. 81. Art. 3 and 4; adopted model, 1983 edition, with exceptions in Administrative Code, Chap. 38, Section .0400 (1983).

Citations

North Dakota	North Dakota Century Code, Title 64 (1981); Weights and Measures Rules and Regulations 69-10-01 (1981).
Ohio	Revised Code of Ohio, Sections 1327, 905, 907, 911, 917, 918, 923, 925, 3715, 3717, 3741 (1974).
Oklahoma	Oklahoma Statutes 1971, "Oklahoma Weights and Measures Law," Title 2, Article 5 (revised 1976).
Oregon	Oregon Administrative Rules, Chapter 603, Sec. 27-200 thru 27-400 (1980).
Pennsylvania	Commonwealth of Pennsylvania Act 368 of 1965 as amended (1974) Sections 28-31; Act 86 of 1941 as amended (1941); 70 Pennsylvania Code 23 (1980).
Puerto Rico	Weights and Measures Law of the Commonwealth of Puerto Rico Act No. 145, Section 19, (1968); Regulation for Specifications of Weight, Measure, Quantity and Tolerances or Variations for Construction Materials (1966).
Rhode Island	Laws Governing Weights and Measures and Balances (Bulletin 11) Title 47, Chapters 4 thru 14 (1980).
South Carolina	"South Carolina Weights and Measures Law", Code of Laws of South Carolina, Title 66, as amended (1971); "South Carolina Seed Law", Code of Laws of South Carolina, 1962, with amendments, Title 3 (1971); Regulations No. 1, 2, and 3 (1971).
South Dakota	
Tennessee	"Weights and Measures Act of the State of Tennessee with Regulations", Tennessee Code Annotated, Title 71, Chap. 2 (1961); Regulation Pertaining to Paper Products, Regulation No. 2 (1966).
Texas	"Weights and Measures Laws," Revised Civil Statutes of Texas, 1925, as amended, Title 93, Chapter 7 (1980).

State	1.1 (a)	1.2 (a)	1.3 (a)	1.4 (a)	1.5 (a)	1.6 (a)	1.7 (a)	1.8 (a)	1.9 (a)	1.10 (a)
Utah	+	+	+	+	+	+	+	+	+	+
Vermont	+	+	+	+	+	+	+	+	+	+
Virginia	+	+	+	+	+	+	+	+	+	+
Virgin Islands					pt	+	+	+	+	+
Washington		+	+	+	pt	+	+	+	+	+
West Virginia	+	+	+	+	+	+	+	+	+	+
Wisconsin	+	+	+	+	+	+	+	+	+	+
Wyoming										

State	2.1 (a)	2.2 (a)	2.3 (a)	2.4 (a)	2.5 (a)	2.6 (a)	2.7 (a)	2.8 (a)	2.9 (a)	2.10 (a)
Utah	+	+	+	+	+	+	+	+	+	+
Vermont	+	+	+	+	+	+	+	+	+	+
Virginia										
Virgin Islands										
Washington										
West Virginia										
Wisconsin										
Wyoming										

State	Utah	Vermont	Virginia	Virgin Islands	Washington	West Virginia	Wisconsin	Wyoming
2.4.2.1	+	+	+	+	+	+	+	+
(a) (b)	+	+	+	+	+	+	+	+
2.4.2.2	+	+	+	+	+	+	+	+
(a) (b)	+	+	+	+	+	+	+	+
2.6.1.1	+	+	+	+	+	+	+	+
2.6.1.2	+	+	+	+	+	+	+	+
2.6.1.3	+	+	+	+	+	+	+	+
2.6.2	+	+	+	+	+	+	+	+
2.6.2.1	+	+	+	+	+	+	+	+
2.6.2.2	pt	+	+	pt	pt	pt	pt	pt
2.7	pt	pt	pt	pt	pt	pt	pt	pt
2.8.1	+	+	+	+	+	+	+	+
2.8.2.1	+	+	+	+	+	+	+	+
2.8.2.2	+	+	+	+	+	+	+	+
2.8.2.3	+	+	+	+	+	+	+	+
2.8.2.4	+	+	+	+	+	+	+	+
2.8.2.5	+	+	+	+	+	+	+	+
2.8.3	+	+	+	+	+	+	+	+
2.9.1.1	+	+	+	+	+	+	+	+

State	Utah	Vermont	Virginia	Virgin Islands	Washington	West Virginia	Wisconsin	Wyoming
2.9.1.2	+	+	+	+	+	+	+	+
2.9.1.3	+	+	+	+	+	+	+	+
2.9.1.4	+	+	+	+	+	+	+	+
2.9.1.5	+	+	+	+	+	+	+	+
2.9.1.6	+	+	+	+	+	+	+	+
2.9.1.7	+	+	+	+	+	+	+	+
2.9.1.8	+	+	+	+	+	+	+	+
2.9.1.9	+	+	+	+	+	+	+	+
2.9.1.10	+	+	+	+	+	+	+	+
2.9.1.11	+	+	+	+	+	+	+	+
2.9.1.12	+	+	+	+	+	+	+	+
2.9.1.13	+	+	+	+	+	+	+	+
2.9.2	+	+	+	+	+	+	+	+
2.9.3	+	+	+	+	+	+	+	+
(a)	+	+	+	+	+	+	+	+
(b)	+	+	+	+	+	+	+	+
TABLE 1	+	+	+	+	+	+	+	+
NOTE 1	+	+	+	+	+	+	+	+
NOTE 2	+	+	+	+	+	+	+	+
2.10 (a)	+	+	+	+	+	+	+	+
(b)	+	+	+	+	+	+	+	+
(c)	+	+	+	+	+	+	+	+
(d)	+	+	+	+	+	+	+	+
(e)	+	+	+	+	+	+	+	+
2.11	+	+	+	+	+	+	+	+
2.12.1 (a)	+	+	+	+	+	+	+	+
(b)	+	+	+	+	+	+	+	+
(c)	+	+	+	+	+	+	+	+
(a) (b)	+	+	+	+	+	+	+	+
2.12.2	+	+	+	+	+	+	+	+
(b)	+	+	+	+	+	+	+	+

State	2.12.3	2.12.4	2.12.5	2.16.6	(a)	(b)	(c)	(d)	3.1	3.2	3.2.1(a)(1)	3.2.1(b)(1)	(2)	(2)	3.3	(a)	(b)	(c)
Utah	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Vermont	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Virginia									+	+	+				+	+	+	+
Virgin Islands																		
Washington																		
West Virginia									+	+					+	+	+	+
Wisconsin																		
Wyoming																		

State	3.4	3.4.1	3.4.2	(a)(1)	(2)	(3)	(b)(1)	(2)	(3)	3.4.3	3.4.4	3.4.5	(a)	(b)	4.	5.
Utah	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Vermont	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Virginia	+	pt	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Virgin Islands																
Washington																
West Virginia	+	pt	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Wisconsin																
Wyoming																

<u>State</u>	<u>Other Methods of Sale Not Included in Model That Are State Requirements</u>
UT	Agricultural twine; dry weight of wood; bulk food commodities; temperature compensation; petroleum tare weights; motor fuel labeling.
VT	Ice; coal, coke, charcoal; log measures; liquid fuels.
VA	Paper plates; sanitary paper products; how certain commodities are to be sold; misleading containers; coal, coke, charcoal; textile yard goods.
VI	Petroleum products octane posting.
WA	Bread pans.
WV	Paper plates; sanitary paper products; capacities and markings of milk bottles; weights per bushel; barrels; climax baskets; measurement of logs, lumber, and timber.
WI	Pickled fruits and vegetables; cheese; fruits and vegetables.
WY	Weights per bushel; measurement of hay; labeling of gasoline.

<u>State</u>	<u>Citations to State Laws and Regulations</u>
Utah	Regulations Governing Method of Sale of Commodities Promulgated Under Authority of Title 4, Chapter 9, Sec. 2, Utah Code Annotated 1953 as Amended A70-05-W4 (1980).
Vermont	Vermont Statutes Annotated, Title 9, Chap. 73, Subchap. 1, (1973). (Automatic adoption of model.)
Virginia	Rules and Regulations for the Enforcement of the Virginia Weights and Measures Law, Sections 3.1-919 through 3.1-969, Code of Virginia 1950, Regulation No. 2 (1975).
Virgin Islands	"Consumer Code of the Virgin Islands" Title 12A, (1981).
Washington	Revised Code of Washington, Title 19, Chapters .92 and .94, (1979).
West Virginia	"Labor Laws of West Virginia" Official Code of West Virginia; Chap. 47, Article 1 (1953); West Virginia Administrative Regulations Chap. 21-2, Series 1 (1976).
Wisconsin	Wisconsin Statutes 1977, Chapter 98 "Weights and Measures", Chapter Ag 54 (1977).
Wyoming	"Weights and Measures Law", Wyoming Statutes, Title 40, Chap. 10 (undated).

*204-2 ICE CREAM AND FROZEN DESSERT COMBINATION FOODS

(This item was carried over from the 67th NCWM, 1982, in which it was assigned voting key 204-5.)

A variety of types of frozen dessert foods are being sold in combination with each other (ice cream, cookies, coatings, etc.) and are being labeled differently from packager to packager. In addition, the net contents declarations as presently expressed on the packages make compliance testing very difficult. For example, an ice milk dessert in a cone with chocolate and nut topping is labeled "3 fl oz ice milk and 1 cone." Another example, an ice cream and cookie sandwich, is labeled "3 fl oz sandwich." A third example, another sandwich, is labeled "3 fl oz plus 2 wafers." The weight or other declaration of the wafer, cookies, cone, or topping is not made and it is extremely difficult to separate the ice cream, ice milk, etc. from the rest of the dessert in order to determine compliance with the fluid volume label declaration.

In response to a letter from the Conference, FDA has said that there is a firmly established trade custom of expressing the quantity of frozen dessert foods in terms of fluid volume and that there does not seem to be any customer confusion resulting from volume plus count declarations for such items as ice cream sandwiches, for example.

The International Association of Ice Cream Manufacturers (IAICM) concurs with the FDA position, noting that a recent study of purchase behavior showed that piece count in ice cream novelties was more important in consumer decisions than the total quantity of contents, and that a review of consumer complaints for the last five years did not reveal a single complaint about the quantity of contents.

The IAICM has volunteered to determine if an audit technique can be developed to spot check these products at the point of sale to determine if an official test needs to be made. Mr. Austin Rhoads, representing IAICM, reported that consultation with ice cream experts indicates that there is some promise of success in a nondestructive checkweighing technique. The official test requires the use of a kerosene bath and is both difficult and tedious; an alternative to the official test is also being investigated. The Committee recommends that this item be carried over until next year.

204-3 SECTION 2.4.2. (PEAT AND PEAT MOSS) UNITS

Several peat and peat moss manufacturers have requested that the specific package sizes listed in sections 2.4.2.1.(a) and (b) and 2.4.2.2.(a) and (b) be eliminated. Changes in marketing required a change in the permitted sizes in 1975. Now the industry finds other sizes than what the model regulation permits (5 and 3 cu ft) to be necessary to follow a new marketing trend. The Committee sees no obvious reason for a list of permitted sizes in this commodity; the Reports of the 1952, 53, 54, 56, 58, 59, 68, 69, 70, 71, and 1975

NCWM's do not indicate the reasons for selecting these sizes or limiting the packaged product to these sizes. It is the only non-food product in the model regulation limited as to sizes; no other horticultural product is so limited. Therefore the Committee recommends elimination of all specific sizes for peat and peat moss. The proposed revision is:

2.4.2. UNITS. --

2.4.2.1. WEIGHT. -- Peat and peat moss sold in terms of weight shall be offered and exposed for sale only in weights per subsection 2.4.2.1(a) or subsection 2.4.2.1(b), pounds and/or kilograms.

- (a) Inch-Round Weights - 50, 40, 20, 10, or 3 pounds.
- (b) Metric Weights - 20, 10, 5, 2, or 1 kilogram.

2.4.2.2. CUBIC MEASURE. -- Peat and peat moss sold in terms of cubic measure shall be offered and exposed for sale only in

volumes per subsection 2.4.2.2(a) or subsection 2.4.2.2(b), cubic feet and/or liters. 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).

- (a) Inch-Round Volumes - 6, 5.5, 4, 2, 1, 0.7, 0.5, 0.3, or 0.2 cubic feet
- (b) Metric Volumes - 200, 100, 50, 20, 10, or 5 liters

The Committee is persuaded by comments made at the open hearing that it should consider the issue of dropping weight as a method of sale for peat and peat moss and will take this up as new business at the next interim meeting.

(Item 204-3 was adopted.)

204-4 SECTION 2.13. INSULATION

The Mineral Insulation Manufacturers Association proposes that Section 2.13. be revised in order to be made consistent with requirements of the Federal Trade Commission (FTC) "Labeling and Advertising of Home Insulation" (16 CFR 460). The FTC requirements vary according to the type of insulation, whether loose-fill or batt, and whether cellulose or non-cellulose. Not only do the FTC requirements specify several more items of information on the label than the NCWM model, but also, in the instance of loose-fill insulation, net weight and thickness statements must be minimum declarations, rather than average.

Staff of the FTC have communicated with the NCWM that the FTC rule does not require the use of the term "minimum net weight" on the package label, even though the FTC rule requires loose-fill insulation manufacturers to declare a net weight that is the minimum weight of insulation in the package. The Committee therefore recommends the following section to replace Section 2.13 in order to achieve consistency with FTC requirements.

2.13. INSULATION

2.13.1. PACKAGED LOOSE-FILL INSULATION EXCEPT CELLULOSE -

Packaged loose-fill insulation, except cellulose, shall declare the net weight with no qualifying statement; each package must contain at least the stated weight. In addition, the following information shall be supplied on the package: minimum thickness, maximum net coverage area, number of bags per 1000 square feet, and minimum weight per square foot at R-values of 11, 19, and 22. This information shall also be supplied for any additional R-values listed.

2.13.2. PACKAGED LOOSE-FILL CELLULOSE INSULATION -

The principal display panel of packaged loose-fill cellulose insulation shall declare the net weight with no qualifying statement; each package must contain at least the stated weight. In addition, the following information shall be supplied on the package: minimum thickness, maximum net coverage area, number of bags per 1000 square feet, and minimum weight per square foot at R-values of 13, 19, 24, 32, and 40. This information shall also be supplied for any additional R-values listed.

2.13.3. BATT AND BLANKET INSULATION -

The principal display panel of packaged batt or blanket insulation shall declare the square feet of insulation in the package, length, and width of the batt or blanket. In addition, R-value and thickness shall be declared on the package.

2.13.4. INSTALLED INSULATION -

Installed insulation must be accompanied by a contract or receipt. For all insulation except loose fill and aluminum foil, the receipt must show the coverage area, thickness, and R-value of the insulation installed. For number of bags used. For aluminum foil, the receipt must show the number and thickness of the air spaces, the direction of heat flow, and R-value. The receipt must be dated and signed by the installer.

Example: This is to certify that the insulation has been installed in conformance with the requirements indicated by the manufacturer to provide a value of R-19 using 31.5 bags of insulation to cover 1500 square feet area. Signed and dated.

(Item 204-4 was adopted as part of the consent calendar.)

204-5 SECTION 2.16. PRECIOUS METALS

(This item was carried over from the 67th NCWM, 1982, in which it was assigned a voting key of 204-7.)

Section 2.16 concerning the method of sale of precious metals was adopted in July, 1982. In its Final Report, the Committee decided to carry over consideration of additional requirements proposed for the sale of precious metals, namely:

- (1) to require a delivery ticket that would include the total weight of the item in troy units, the price per troy unit and karat value, and the total price paid for the item; and
- (2) to require posting of acid-etch colors associated with the determination of karat value or fineness.

As to the first proposal, the members of the Committee believe that requiring a delivery ticket does not solve the problem of deception or fraud potential in the buying of precious metals. When an individual sells an item of precious metal and receives a delivery ticket for it, he or she no longer has the proof that what he or she sold, in fact, might not be what is represented on a delivery ticket because he or she has turned over to the buyer the item of precious metal. As to the second proposal, it is the opinion of the Committee members that the determination of fineness by means of an acid etch procedure is a qualitative, subjective test that must be used with great caution, and, in addition, is not a measurement in which weights and measures officials normally have expertise. (The Jeweler's Vigilance Committee, New York City, normally recommends a fire assay in order to determine fineness.) Therefore, the Committee recommends no further additions to the method of sale for precious metals adopted by the Conference last year.

(Item 204-5 was adopted as part of the consent calendar.)

204-6 BARK MULCH

(This item was carried over from the 67th NCWM, 1982, in which it was assigned a voting key of 206-1.)

The Committee has discussed several issues associated with prepackaged bark mulch and has several recommendations to make. The issues are interrelated and so the Committee directs the Conference to the several sections out of sequence with the normal order of the Committee's report. Item 204-6-3 is a proposal for an addition to the Model State Packaging and Labeling Regulation, item 204-6-1 is a proposal for an addition to the Model State Regulation for the Method of Sale of Commodities, and item 204-6-2 is a recommended test procedure which, if adopted by the Conference, would appear in the next edition of NBS Handbook 133.

204-6-1 SECTION 2.17. BARK MULCH (MODEL STATE REGULATION FOR THE METHOD OF SALE OF COMMODITIES)

(This item was carried over from the 67th NCWM, 1982, in which it was assigned a voting key of 206-1-1.)

The Committee directs the Conference to last year's Final Report (p. 145, Report of the 67th NCWM, 1982) for a complete discussion of this item.

The Committee recommended last year that bark mulch be sold by volume. For those packagers desiring to label a metric quantity on the package along with the inch-pound declaration, the Committee sought to determine whether Canada had requirements that would limit the metric declaration for those packagers who also wished to sell their product in Canada.

The Committee has been informed that Canada has no specific labeling requirements for bark mulch. In quantities less than 1/2 cubic meter, the term liter or cubic decimeter may be used in Canada.

It is the opinion of the members of the Committee:

- (1) that volume measure is the most appropriate method of sale for this commodity;
- (2) that the liter is a metric unit better understood by the public than the cubic decimeter;
- (3) that section 6.5(e) and 6.6(e) of the Model State Packaging and Labeling Regulation should be followed in the method of sale of this commodity; and
- (4) that the Federal Trade Commission staff guidelines, entitled the "Rule of 1000" is excellent advice that should be followed by packagers in labeling.

Based on requests from industry and States, the Committee recommends the following addition to the Model State Regulation for the Method of Sale of Commodities:

SECTION 2.17. BARK MULCH - All bark mulch shall be sold, offered, or exposed for sale in terms of volume measure: in inch-pound units, in terms of the cubic yard or cubic foot; in metric units, in terms of the cubic meter or liter.

(Item 204-6-1 was adopted as part of the consent calendar.)

(This item was carried over from the 67th NCWM, 1982, in which it was assigned voting keys of 206-1-2 and 206-1-3.)

In last year's Final Report (p. 146, Report of the 67th NCWM, 1982), the Committee recommended a test procedure for bark mulch on a conditional or trial basis, and requested further information on test container dimensions and other methods.

The Committee thanks all those jurisdictions that provided information and data, in particular: the States of Alabama, Florida, and Virginia, and in addition, Appleton, Wisconsin; Birmingham, Alabama; Bucks County, Pennsylvania; and Nassau and Suffolk Counties, New York.

Data provided the Committee indicate:

- (1) Identical results were obtained when using test measures with a 12-inch by 12-inch cross section as were obtained with test measures with a 9-inch by 16-inch cross section. Only test measures with a 3-to 4-foot high configuration (and either 9" by 16" or 12" by 12" cross section) were compared.
- (2) Rocking the test measure after filling with bark mulch further compressed the mulch one to two inches in depth (144 to 288 cubic inches in volume).

This compression is equivalent to 2.8 to 5.5% compression of a 3-cubic foot bag, or 4.2 to 8.3% of a 2 cubic foot bag. The Committee believes that greater variability will be introduced into the test results if rocking is recommended as part of the procedure. One official may rock the container more or less vigorously than another, resulting in more or less compression.

- (3) Because of the unevenness of the material being measured, a box with interior scribes at each 1/2 inch is sufficient for reading the level. A clear lexan or plexiglass side in the test measure was found convenient in reading the level. A box with a height of 4 feet was found useful for other horticultural products with net contents up to 4 cubic feet.

The Committee recommends the following test method for bark mulch:

Construct test measure of materials that will not bulge when filled with mulch (for example, 1/2 inch plywood), with interior dimensions 9 inches by 16 inches by 48 inches high with 2 opposite inside walls of the measure marked or scribed at 1/2 inch intervals. A container with other interior dimensions is also acceptable as long as it approximates the configuration of the package being tested (e.g., 12- by 12-inch interior). Container height may also be reduced from 48 inches but will restrict the

maximum size of package that can be tested. A lexan or plexiglass side wall can be useful in determining the level of fill.

(Each half inch of depth of the test measure is equivalent to 72 cubic inches of volume in the 9- by 16-in or 12- by 12-in configurations.)

For each bag of mulch to be measured, pour bag into container, and level the contents by hand. Do not rock, shake, drop, or tamp the container. Read the vertical marks in order to determine package net contents.

(Item 204-6-2 was adopted as part of the consent calendar.)

204-6-3 SECTION 10.11. BARK MULCH: VARIATIONS FROM DECLARED VOLUME
(MODEL STATE PACKAGING AND LABELING REGULATION)

(This item was carried over from the 67th NCWM, 1982, in which it was assigned a voting key of 206-1-4.)

Many of the jurisdictions that provided the Committee information on the bark mulch test method also provided actual compliance data on packaged bark mulch. The Committee considered only the variability of individual packages of mulch in those lots of mulch that were found to average at or above the label. In those lots, individual packages were as much as 144 cubic inches short (2.8% of a 3-cubic foot bag or 4.2% or a 2-cubic foot bag), even though other bags in the same lot compensated for the shortages in these individual bags. This corresponds to only one inch of depth in the test measure. Therefore, the Committee recommends permitting an individual bark mulch package variation of 5 percent.

This variation is not a tolerance. The average requirement must still be met. If a jurisdiction is using Handbook 67, the 5 percent figure would be used instead of the Table of Unreasonable Minus or Plus Errors on page 8, and if using Handbook 133, the 5 percent figure would be used instead of Table 2-9.

The Committee therefore recommends the following section (similar to Section 10.9.3. Textiles: Variations from Declared Dimensions.) be added to the Model State Packaging and Labeling Regulation:

*Section 10.11. Bark Mulch: Variations from Declared Volume --
An individual package minus variation greater than 5 percent of
the declared volume shall be considered unreasonable.*

(Item 204-6-3 was adopted as part of the consent calendar.)

The Committee met jointly with the Liaison Committee on this issue.

Manufacturers of unvented (non flue-connected) kerosene heaters recommend the use of fuel meeting the American Society for Testing and Materials (ASTM) specifications for "1-K" (a lower sulfur content than the more common "2-K" kerosene). Kerosene dispensed from bulk at automotive service stations is rarely labeled by its ASTM grade. Furthermore, the Committee was informed that prepackaged containers of kerosene are not always labeled by ASTM grade.

A representative from the American Petroleum Institute (API) explained that the addition of labeling requirements for kerosene will probably result in most kerosene dispensers from bulk being labeled "2-K" (even though close to half of the kerosene being produced is "1-K") because of the numerous possibilities for exchanges of product between refinery and service station. Those marketers who wish to label their product "1-K" will have to provide for dedicated transportation and storage of this specific product; this probably will be most feasible in locations within 150 miles of the refinery, according to the API.

Because of the potential for hazard to health when "2-K" kerosene is used in unvented kerosene heaters, the Committee believes that customers should be informed as to the grade of kerosene prior to purchase. Therefore the Committee recommends the following section to be added to the Model State Regulation for the Method of Sale of Commodities:

SECTION 2.18. KEROSENE - All kerosene kept, offered, exposed for sale, or sold shall be identified as such and will include, with the word kerosene, an indication of its compliance with the standard specification adopted by the American Society for Testing and Materials in Specification number D-3699 (1982 or latest revision). Example: 1K Kerosene; Kerosene - 2K.

It was also pointed out that "space heater fuel" is being sold that may have kerosene in it or be kerosene based, and may even be equivalent to jet fuel. These products may be extremely dangerous with respect to their combustibility and health effects. Officials who observe these products being sold should contact the local fire marshal or environmental health official in order to determine the safety of such products.

(Item 204-7 was adopted.)

*204-8 POTTING AND TOP SOIL

(This item was carried over from the 67th NCWM, 1982, in which it was assigned voting key 204-8.)

In last year's final report, the Committee expressed the opinion that the appropriate net contents statement for these types of products should be dry volume (or cubic measure) with or without a net weight declaration, as the packager chooses. The Committee solicited the opinions and experience of Conference members and others as to whether a method of sale should be recommended. Five manufacturers of these types of products provided reasons for not limiting the method of sale to dry volume or cubic measure only. Some of their reasons were:

Topsoil is a low cost commodity usually sold in 40- or 50-lb packages for use on lawns and gardens. Net weight fillers operate at a higher speed than most volumetric fill machines for this material and would require the outlay of many millions of dollars to comply - all resulting in increased cost to the consumer of a relatively cheap product. Potting soil is used primarily indoors or in containers on patios and varies much more than top soil in density because of the different products that may be mixed to produce the potting soil. If net contents by volume only were permitted, unit pricing and fixed volume bags would tend to favor lower density soils which would weigh less than higher density soils of the same volume; yet, many consumers favor the higher density potting soils.

Consumers are not confused over the present potting soil labeling practices. The product is packaged in a poly bag which can be examined as to the extent of product fill and compared with competing products as to volume, weight, color, and other more qualitative factors.

The Committee heard several comments from the floor during the general meeting concerning the need to consider labeling by volume as a method of sale for these commodities along with soil amendments such as peat and peat moss. Therefore, the Committee recommends carrying this item over to permit input from industry at next year's interim meeting.

*205 MODEL STATE REGULATION FOR THE VOLUNTARY REGISTRATION OF
SERVICEPERSONS AND SERVICE AGENCIES FOR COMMERCIAL WEIGHING
AND MEASURING DEVICES

(This item was carried over from the 67th NCWM, 1982, in which it was assigned a voting key of 205-1).

As a result of the survey conducted by the Committee last year, several proposals to revise and improve the Model Regulation were made to the Committee that required further study. These proposals are listed and discussed below.

1. Add minimum equipment requirements, and
2. Add a requirement that all necessary testing equipment be available and be used at the installation or repair site.

Members of the Committee strongly endorse the addition of minimum equipment requirements. At the present time the Committee can only address scale installation and repair equipment. Further input is needed from Conference members and others concerning minimum equipment requirements for retail and rack liquid measuring devices, LPG meters, and other commercial devices.

The Committee suggests the following minimum equipment for commercial scales:

- (a) small capacity (up to and including 400-lb capacity scales): The applicant must have available and use appropriate and sufficient test weights, approved and calibrated, to test scales to capacity.
 - (b) large capacity: The applicant must have available and use a minimum of 10 000-lb calibrated and approved test weights for large capacity scale installation, testing, and repairing.
3. Add specific qualifications for service representative or service agency.

The members of the Committee feel strongly that the serviceperson must be the one registered, not the agency. The quality of repair and service depends entirely on the quality of an individual's work, assuming he or she has the minimum equipment with which to work. Therefore, the Committee recommends that a registration certificate be issued to the repair person and that only records be kept of service agencies and their employees. This will permit service agencies to hire apprentices who can accompany the registered serviceperson in order to learn the trade, but will permit the weights and measures authority to register only the most qualified service agents.

The Committee discussed many alternatives for specific qualifications for servicepersons; requiring one year's on-the-job experience or attendance at a service school was most favored. However, no unanimity in this area was reached. The Committee does favor inclusion in the policy statement of a recommendation of schooling or one year of experience as minimum qualifications. The Committee does not favor a serviceperson bonding requirement because bonding usually sets limits on the extent of the serviceperson's liability.

4. Add specific information that must be included on the placed-in-service report, including type of test and test equipment used.

Committee members believe that the placed-in-service report should be designed by the weights and measures department and have appropriate spaces for increasing and decreasing load, shift tests, etc. to indicate immediately whether or not all testing had been accomplished. Examples of such placed-in-service reports or of the department's forms for its own officials provided to the Committee will be published in order to provide further guidance.

5. Add a requirement that registration be based on the quality of past performance, and that maintenance of registration be based on both review of placed-in-service reports and on reinspection; and
6. Add an automatic expiration for the registration certificate at the end of the annual or biennial calibration of standards, with reissuance contingent on all requirements of the Director being met.

The Committee strongly concurs with both proposals.

7. Add specifications of what action or failure of action constitute violation of the regulation.

Again, the Committee endorses this proposal. Because the model is written as a voluntary registration, a section describing violations to the regulation should be added so as to clarify what is voluntary (registration) and what is not voluntary (good repair).

It is worthwhile to point out how one State applies its voluntary registration program in order to achieve a condition closer to mandatory registration programs. All scales requiring repair are condemned by the weights and measures officials in this State. Since only registered service persons can remove a red tag, only registered persons can repair the scales.

The Committee believes that the reciprocity section of the model should be deleted. Most States understand this section to cover reciprocity of standards calibration by other State laboratories. Registration records must still be kept and decisions as to quality of service must still be made by each individual State. Therefore, the Committee will propose wording to clarify standards calibration reciprocity.

The Committee received several comments by letter and from the floor at the general meetings:

- o that registration of the service agency should be retained,
- o that the date of re-registration should be staggered so as to spread out the administrative workload,
- o that the certificate should automatically terminate after a set period of time,
- o that 10,000 lbs of test weights are not adequate for large capacity scale installation and repair,

- o that the recommendation for small capacity scale test weights should correspond with changes in the Scale Code of Handbook 44,
- o that NBS Handbooks 105-1, -2, and -3 should be referenced in the regulation.

The Committee is not yet ready to recommend the following revision to the model regulation and the accompanying policy statement. Further input from interested parties would be welcomed, especially with respect to minimum equipment requirements. The Committee recommends that this item be held over until next year.

SECTION 1. POLICY

For the benefit of the users, manufacturers, and distributors of commercial weighing and measuring devices, and for those installing, servicing, and repairing such devices, it shall be the policy of the Director of Weights and Measures, hereinafter referred to as "Director," to accept voluntary applications for registration of (a) an from persons individual and (b) an agency that provided ing acceptable evidence that he, or she, or it is fully qualified by training or experience to install, service, repair, or recondition a commercial weighing or measuring device; has a thorough working knowledge of all appropriate weights and measures laws, orders, rules, and regulations; and has possession of, or available for use, weights and measures standards and testing equipment appropriate in design and adequate in amount. (An employee of government shall not be eligible for registration.)

The Director will check the qualifications of each applicant. It will be necessary for a Scale Mechanic to have available sufficient test weights of approved calibration to test a small capacity scale to capacity (a small capacity scale is a scale of not more than 400-pound capacity) and a minimum of 10 000 pounds of approved test weights for a Large Capacity Scale Mechanic to be registered to service large capacity scales. Test weights to be approved must be calibrated at least once a year (or biennium) or more often by the State Weights and Measures Laboratory or by the proper authorities of another State that can show traceability to the National Bureau of Standards.

It will be necessary for a Liquid Measuring Device Serviceperson to have available

(to be written)

It will be necessary for Other Commercial Devices Serviceperson to have available

(to be written)

It shall also be the policy of the Department to issue to qualified servicepersons whose applications for registration are approved a "Certificate of Registration." This will give authority to remove condemnation seals and tags placed on weighing devices by authorized State Inspectors and local sealers, and to place in service repaired devices, which have been previously condemned, or to place in service devices that have been newly installed.

The Director is NOT guaranteeing the work or fair dealing of a Registered Serviceperson. He will, however, remove from the registration list any Registered Serviceperson who does unsatisfactory work or takes unfair advantage of a device owner.

Registration with the Director shall be on a voluntary basis. The Director shall reserve the right to limit or reject the application of any Serviceperson and to revoke his or her permit to remove condemnation seals and tags for good cause.

This policy shall in no way preclude or limit the right and privilege of any qualified individual or agency not registered with the Director to install, service, repair, or recondition a commercial weighing or measuring device (however, see Section 6 below).

SECTION 2. DEFINITIONS

2.1 REGISTERED SERVICEPERSON. -- The term "Registered Serviceperson" shall be construed to mean any individual who for hire, award, commission, or any other payment of any kind, installs, services, repairs, or reconditions a commercial weighing or measuring device, and who voluntarily registers applies for himself or herself as such with registration and is approved by the Director of Weights and Measures.

~~2.2--REGISTERED-SERVICE-AGENCY.---The-term-"Registered-Service-Agency" shall-be-construed-to-mean-any-agency,-firm,-company,-or-corporation which,-for-hire,-award,-commission,-or-any-other-payment-of-any-kind, installs,-services,-repairs,-or-reconditions-a-commercial-weighing-or measuring-device,-and-which-voluntarily-registers-itself-as-such-with the-Director-of-Weights-and-Measures.--Under-agency-registration, identification-of-individual-servicepersons-shall-not-be-required.~~

2.32 COMMERCIAL WEIGHING AND MEASURING DEVICE. -- The term "commercial weighing and measuring device" shall be construed to include any weight or measure or weighing or measuring device commercially used or employed in establishing the size, quantity, extent, area, or measurement of quantities, things, produce, or articles for distribution or consumption, purchased, or offered, or submitted for sale, hire, or award, or in computing any basic charge or payment for services rendered on the basis of weight or measure, and shall also include any accessory attached to or used in connection with a commercial weighing or measuring device when such accessory is so designed or installed that its operation affects, or may affect, the accuracy of the device.

SECTION-3--RECIPROCITY

~~The-Director-may-enter-into-an-informal-reciprocal-agreement-with-any other-State-or-States-that-has-or-have-similar-voluntary-registration policies.--Under-such-agreement,-the-Registered-Servicepersons-and-the Registered-Service-Agencies-of-the-States-party-to-the-reciprocal agreement-are-granted-full-reciprocal-authority,-including-reciprocal recognition-of-certification-of-standards-and-testing-equipment,-in-all States-party-of-such-agreement.~~

SECTION 4-3. REGISTRATION FEE

There shall be charged by the Director an annual fee of \$1.00-(\$) per Registered Serviceperson and \$5.00-per-Registered-Servic-e-Agency to cover costs at the time application for registration is made, and annually, during the month of January thereafter.

SECTION 5-4. VOLUNTARY REGISTRATION

An individual ~~or agency~~ qualified by training or experience may apply for registration to service weighing devices or measuring devices on an application form supplied by the Director. Said form, duly signed and witnessed, shall include certification by the applicant that the individual ~~or agency~~ is fully qualified to install, service, repair, or recondition whatever devices for the service of which competence is being registered; has in possession, or available for use, and will use all necessary testing equipment and standards; and has full knowledge of all appropriate weights and measures laws, orders, rules, and regulations. An applicant also shall submit appropriate evidence or references as to qualifications.

Application for registration shall be voluntary, but the Director is authorized to reject or limit any application.

SECTION 5. MINIMUM EQUIPMENT

Applicants for small capacity scale service must have available sufficient test weights approved and calibrated to test to capacity scales up to 400-lb capacity. For large capacity weighing systems and scales, 10 000 pounds of calibrated and approved test weights must be shown to be available.

(other equipment requirements to be written)

The Director will review and check the qualifications of each applicant if it is determined that the applicant is qualified. Upon receipt and acceptance of a properly executed application form, The Director shall issue to the applicant a "Certificate of Registration," including an assigned registration number which shall remain effective until either returned by the applicant or withdrawn by the Director. The "Certificate of Registration" will expire on December 31 of each year.

SECTION 7-6. PRIVILEGES AND RESPONSIBILITIES OF A VOLUNTARY REGISTRANT

A bearer of a Certificate of Registration shall have the authority to remove an official rejection tag or mark placed on a weighing or measuring device by the authority of the Director; place in service, until such time as an official examination can be made, a weighing or measuring device that has been officially rejected; and place in service, until such time as an official examination can be made, a new or used weighing or measuring device. The Registered Serviceperson is responsible for installing, repairing, or adjusting weighing or measuring devices such that the devices are adjusted as closely as practicable to zero error.

SECTION 8~~7~~. PLACED IN SERVICE REPORT

The Director shall furnish each Registered Serviceman~~person~~ and Registered-Servic~~ee~~-Agency with a supply of report forms to be known as "Placed in Service Reports." Such a form shall be executed in triplicate, shall include the assigned registration number, and shall be signed by a Registered Serviceman~~person~~ ~~or-by-a-serviceman~~ representing-a-Registered-Agency for each rejected device restored to service and for each newly installed device placed in service. Within 24 hours after a device is restored to service, or placed in service, the original of the properly executed Placed in Service Report, together with any official rejection tag removed from the device, shall be mailed to the Director at _____. The duplicate copy of the report shall be handed to the owner or operator of the device, and the triplicate copy of the report shall be retained by the Registered Serviceman~~person~~ ~~or-Agency~~.

SECTION 9~~7~~8. STANDARDS AND TESTING EQUIPMENT

A Registered Servic~~ee~~person and-a-Registered-Servic~~ee~~-Agency or the Service Agency who supplies his or her test equipment shall submit, at least annually (or biennially) to the Director, for examination and certification, any standards and testing equipment that are used, or are to be used, in the performance of the service and testing functions with respect to weighing and measuring devices for which competence is registered. A Registered Servic~~ee~~person ~~or-Agency~~ shall not use in servicing commercial weighing or measuring devices any standards or testing equipment that have not been certified by the Director. Equipment calibrated by another State Weights and Measures laboratory that can show traceability to the National Bureau of Standards will also be recognized as equipment suitable for use by Registered Servic~~ee~~persons.

SECTION 10~~7~~9. REVOCATION OF CERTIFICATE OF REGISTRATION

The Director may is authorized to for-good-cause, after-careful investigation and consideration, suspend or revoke a Certificate of Registration for good cause, which shall include but not be limited to: failure to have test equipment certified, failure to use adequate testing equipment, or failure of commercial equipment to comply with Handbook 44 subsequent to service or repair.

SECTION 11~~7~~10. PUBLICATION OF LISTS OF REGISTERED

SERVICEPERSONS-AND-REGISTERED-SERVIC~~EE~~-AGENCIES

The Director shall publish, from time to time as he or she deems appropriate, and may supply upon request, lists of Registered Servic~~ee~~persons and-Registered-Servic~~ee~~-Agencies.

SECTION 12~~7~~11. EFFECTIVE DATE

This regulation shall become effective on _____.

The NCWM in 1973 voted to recommend the Model State Open Dating Regulation for adoption by State and local jurisdictions and for use by the private sector in voluntarily providing uniform open dating information. Based on telephone surveys, only five States reported adoption of the model regulation by 1982. A few years after the NCWM Model was adopted, the U.S. Congress' Office of Technology Assessment (OTA) conducted hearings to collect background data for possible Federal legislation. Using the information provided by the NCWM and OTA, the Association of Food and Drug Officials (AFDO) approved a model law in 1980. There is no exact count as to the number of jurisdictions using the AFDO model, but it is estimated that no more than five or six States or cities have adopted this model. AFDO's model does not seriously conflict with NCWM's, but it is more extensive and definitive than the NCWM's. Dr. E.C. Heffron, Chief of the Food Division of the Department of Agriculture, State of Michigan, proposes that the NCWM determine the feasibility of uniformity between NCWM's and AFDO's Open Dating Models, with the long range goal of providing a single model endorsed by both the NCWM and AFDO to the Council of State Governments for their approval and recommendation.

As the first step towards this objective, the Committee provides the AFDO "Uniform State Open Dating Bill" (reprinted below) as information for NCWM members, and requests further discussion and opinions to be forwarded to the Committee's attention. In general, members of the Committee believe that most of the AFDO model requirements are improvements on the NCWM model. There are several issues or items listed below that the Committee will address during the coming year. The Committee will work towards a recommendation for a new NCWM model by January, 1984.

1. The AFDO model is presented as a law because the AFDO organization has not built a system of model regulations that implement a basic enabling law (such as the NCWM Model State Packaging and Labeling Regulation and the Model State Weights and Measures Law). The Committee will make changes in the AFDO model to make it conform to model regulation outlines (e.g., removal of Sections 100.2(a), 100.3 (a)(1), 100.10, 100.11, 100.12, 100.13, and 100.14; change of title and references to "Act").
2. The NCWM model limits food requiring a "sell by" date to that spoiling or losing palatability within 60 days from the date of packaging. The AFDO model requires the "sell by" date on food spoiling within 90 days from the date of packaging. The Committee presently favors the 60-day definition, but would appreciate receiving any opinions or information on this issue.

3. Meat, poultry, seafood, and fresh produce are specifically excluded in Section 2.3 of the NCWM Model State Open Dating Regulation. The AFDO model specifically exempts fresh produce and not meat, poultry, and seafood. The Committee requests input on whether NCWM members wish to continue exclusion of these latter items from open dating requirements. Presented on the following pages is the AFDO model:

ASSOCIATION OF FOOD AND DRUG OFFICIALS
MODEL UNIFORM STATE OPEN DATING BILL

100.1 Short Title. This Act may be cited as the Open Dating Act of (insert year enacted).

100.2 Purpose, scope, and application.

(a) Purpose. The purpose of this Act is to cause certain foods to be identified relative to physical sensory qualities both for the use by the user and rotation by the distributor(s).

(b) Scope. This Act prescribes the method of posting and identification date, date determination, required records, responsible persons, and foods subject to the Act. In addition, this Act provides for exemption of certain foods and for sale of foods after the expiration of an identifying open date.

100.3 Definitions.

(a) For purposes of this Act, the following definitions shall be applicable:

- (1) "Act" means Act No. (insert No.) of the Public Act of (insert year).
- (2) "Sell by date" means a recommended last date of sale that permits a subsequent period before deterioration of qualities described in (3), (4), and (5).
- (3) "Perishable food" means any food having a significant risk of spoilage, loss of value, or loss of palatability within 90 days of the date of packaging.
- (4) "Semi-perishable food" means any food with greater than 90 days, but less than 6 months after the date of packaging before having a significant risk or spoilage, loss of value, or loss of palatability.
- (5) "Long shelf-life food" means any food in which a significant risk of spoilage, loss of value, or loss of palatability would not occur sooner than 6 months after the date of packaging including foods preserved by freezing, dehydrating, or being in a hermetically sealed container.
- (6) "Prepackaged" means packaged prior to being displayed or offered for retail sale.
- (7) "Best if used by date" means a date prior to deterioration of qualities described in (4) and (5).

- (8) "Person" means an individual, partnership, association or corporation.

100.4 Sale of perishable food and date determination.

(a) A retail food establishment shall not sell or offer for sale prepackaged perishable food unless identified with a "sell by" date.

- (b)(1) Perishable foods shall not be offered for sale after the "sell by" date unless it is wholesome and advertised in a conspicuous manner as being offered for sale after the recommended last date of sale. The placement of a sign, sticker, or tag is acceptable for such advertising if it is easily readable and clearly identifies the perishable food as having passed the recommended last date of sale.
- (2) The retailer or final seller is responsible for the advertisement, described in (1), of a perishable food offered for sale after the recommended last date of sale.
- (c)(1) A manufacturer, processor, packer, repacker, retailer, or other person who prepackages perishable food, shall determine a date which allows a reasonable period after sale, for consumption of the food, without physical spoilage, loss of value, or loss of palatability. A reasonable period for consumption shall consist of at least one third of the approximate total shelf life of the perishable food.
- (2) A retailer who purchases prepackaged perishable food may upon written agreement with the person prepackaging such food determine, identify, and be responsible for the date placed on or attached to each package of such food.
- (d)(1) A person described in section (c)(1) or (2) shall place on or attach to each package of perishable food a date by month and day. However, bakery products with a shelf-life of not more than 7 days may be dated with the day of the week representing the last recommended day of sale.
- (2) The "sell by" date shall be displayed with the term "sell by" immediately preceding or immediately over the designated date unless a prominent notice is on the label describing the date as a "sell by" date and indicating the location of the date.
- (3) If the day of the week is solely designated as provided for in section (d)(1), the name of the day may be abbreviated by the use of either the first two or first three letters of the name of the day.

- (4) Except as provided for in section (d)(1), the date shall be designated by the first three letters of the month followed by a numeral indicating the calendar day or designated by the month represented numerically followed by a numeral designation of the calendar day. The month and day designation shall be separated by a period, slash, dash, or spacing. When a numeral designation of the first nine days of the month is used, the number shall include a zero as the first digit; for example, 01 or 03.
- (5) The "sell by" date may include the year following the day if such year is expressed as a two or four digit number separated as described in section (d)(4).

100.5 Sale of semi-perishable and long shelf-life food.

(a) A manufacturer, processor, packer, repacker, or other person who prepackages semi-perishable or long shelf-life food may place upon or attach to the package an open date providing it is designated by the "best if used by" date.

(b) A retail food establishment may sell or offer for sale food beyond the designated "best if used by" date providing the food is wholesome and the sensory physical quality standards for that food have not significantly diminished.

(c) The "best if used by" date as required by section (a) shall be placed upon or attached to each container or package and be limited to the terms "best if used by" followed by or immediately over the date designated by the month and year unless a prominent notice is on the label describing the date as a "best if used by" date and indicating the location of the date. The date shall be designated by the first three letters of the month followed by a numeral indicating the year. The use of the day of the month is permissible providing the day of the month is placed prior to the month; for example, 30 JUN 81.

100.6 Placement of the date.

The date, whether a "sell by" or "best if used by," shall be printed, stamped, embossed, perforated, or otherwise shown on the package, label on the package, or tag attached to the package in a manner that is easily readable and separate from other information, graphics, or lettering so as to be clearly visible to a prospective purchaser. The date shall not be superimposed on other required information or obscured by other information, graphics, or pricing. Regardless of the type size used, the date shall be easily readable. These requirements do not preclude the serving of a supplemental notice elsewhere on a package describing and/or indicating the location of the date.

100.7 Factors for the date determination.

A person who, as provided for in this Act, places either the "sell by" date or "best if used by" date shall determine the date taking into consideration the food quality, characteristics, formulation, processing impact, packaging or container and other protective wrapping or coating, customary transportation, and storage and display conditions. For purposes of calculating this date, home storage conditions shall be considered similar to the usual retail store except that refrigerated food may be calculated using a home storage temperature standard of 40 degrees Fahrenheit (4.4 degrees Celsius).

100.8 Records.

A person responsible for establishing the date for perishable, semi-perishable, and long shelf-life food shall keep a record of the method used for the determination of that date. A record revision is necessary whenever a factor affecting date determination is altered. Such record shall be retained for not less than 6 months after the most recent "last date of sale" or "best if used by" date and be available during normal business hours for examination upon request by (insert agency name).

100.9 Exemptions.

(a) This Act does not apply to fresh fruits and vegetables offered for sale unpackaged or in a container permitting sensory examination, other non-packaged food and food products, salt, and crystallized refined sugar.

(b) This Act does not apply to an individually packaged food item that is a component of a larger packaged food item if the larger food item is identified with a date the same as or earlier than the date of the component.

100.10 Criminal penalties.

A violation of any provision of this Act shall be a misdemeanor punishable by a fine of not more than (insert appropriate amount) or by imprisonment for not longer than (insert appropriate length of time), or by both such fine and imprisonment.

100.11 Injunctions.

The State of (insert name of State) or any person may bring an action for an injunction in the (insert name of appropriate court) to restrain any violation of this Act and to compel any person or firm subject to the requirements of this Act to comply with its provisions.

100.12 Seizure; Condemnation.

(a) Whenever a duly authorized agent of the (insert agency name) finds or has probable cause to believe any food does not comply with but is subject to the requirements of this Act, he may affix to such article a tag or other appropriate marking, giving notice that such article is suspected of being in violation of this Act and has been detained or embargoed, warning all persons not to remove or dispose of such articles by sale or otherwise until permission is given by an authorized agent or court. It shall be unlawful for a person to remove or dispose of such detained or embargoed articles by sale or otherwise without permission.

(b) When an article is in violation of this Act, it shall be liable to be proceeded against by petition of the (insert type) court in whose jurisdiction the article is located, detained, or embargoed for libel condemnation of such article. When an authorized agent has found that a detained or embargoed article is not in violation of this Act, he shall remove the tag or other marking.

100.13 Destruction; costs; corrected food.

If the court finds the detained or embargoed food is identified in violation of this Act, after entry of the decree it shall be destroyed at the expense of the claimant thereof, under supervision of the agent, and all court costs, fees storage, and other proper expenses shall be taxed against the claimant of such article or his agent. Provided the violation can be corrected by proper labeling, marking, or processing of the food, the court, after entry of the decree and after the costs, fees, and expenses have been paid and a good and sufficient bond has been executed, may direct the food be delivered to the claimant for labeling, marking, or processing under the supervision of an agent of the (insert agency name). The expense of the supervision shall be paid by the claimant. The food shall be returned to the claimant of the food on the representation to the court by the (insert agency name) that the food is no longer in violation of this Act, and the expenses of supervision have been paid.

100.14 Preemption of local, county, and municipal ordinance.

A municipality or county shall not adopt or impose standards or requirements other than those provided for in this Act.

100.15 Effective date.

This Act shall become effective on and after (insert appropriate date).

100.16 Repeal of prior Acts.

(Describe by title and citation any previous State law that establishes requirements for open dating of food) (is)(are) hereby repealed.

The Committee recommends that this item be held over for further action next year.

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GUIDELINES AND INTERPRETATIONS

207-1 POLICY AND GUIDELINES ON MOTOR FUEL DELIVERIES (GAS PUMP) PRICE POSTING RELATING TO CASH DISCOUNTS

In July, 1982, the Conference adopted policy and guidelines for the practice of cash discount sales of motor fuel (see voting key 206-5, p. 150-152, Report of the 67th NCWM, 1982). There continues to be considerable debate concerning whether to set the dispenser computer's unit price (on those dispensers capable of setting only one price) on the cash discount or the credit card price (as long as both prices are displayed somewhere at or on the dispenser). In addition, there has arisen some confusion as to the different regulatory and enforcement roles played by the Federal Reserve Board and the Federal Trade Commission in the administration of the Cash Discount Act.

The Federal Reserve Board (FRB) has been given authority to write regulations under the Federal Cash Discount Act of 1981 (PL97-25). The Federal Trade Commission (FTC) has been assigned the responsibility of enforcing those regulations. The FTC cannot interpret the Federal Cash Discount Act nor can it conflict with interpretations of the FRB. The FRB does not intend to clarify its interpretations of the Federal Cash Discount Act any more than it has (see last year's NCWM report) and this leaves open what might be meant by the statement, "...the higher price...must be displayed at the pump..."

The NCWM Policy and Guidelines as adopted in 1982 are reprinted below:

Policy and Guidelines on Motor Fuel Deliveries (Gas Pump) Price Posting Relating to Cash Discounts

Discounting for cash transactions is a management decision of the merchandiser. Those merchants who elect to offer cash discounts on motor fuel must comply not only with the Federal Cash Discount Act but also with the State and local weights and measures laws and regulations. All such laws are intended to prohibit deceptive, misleading, or misrepresentative information to the consumer. The following guidelines are intended to apply to price advertising or posting at the streetside

or highway as well as at the pump and to the price computed at the dispenser. These guidelines are applicable to other discount offers (such as combination purchases of car wash and gas for example).

1. If a price is posted or advertised, it must be available to all qualified customers. If any condition or qualification is required to obtain the posted price, that condition must also be posted clearly and understandably in conjunction with the price wherever it is posted.
2. The cash price may be disclosed on the posted or advertising sign by itself as long as the sign clearly indicates that the price is limited to cash purchases and as long as State requirements do not prohibit it.
3. If the merchandiser elects to establish separate pumps or islands for credit card and for cash sales, the pumps or islands shall be clearly identified as "cash" or "credit" to avoid customer confusion.
4. If the merchandiser wishes to offer cash discounts off the credit card price as well as permit credit card sales from a single dispenser, a chart expressed in terms of both the total quantity delivered and the total cash discount applicable (in 1¢ increments) shall be prominently displayed so as to be easily read by the customer at the time of purchase. However, this practice should have only "interim" status.
5. In order to permit cash and credit card sales from a single dispenser with the minimum amount of customer confusion, the NCWM should adopt a plan and timetable for changeover to devices that can compute and display final money values for either cash or credit card transactions.

The Committee wishes to reaffirm the policy and guidelines adopted by the Conference last year and provides additional remarks as further explanation.

Policy/Guideline (4) is based on the following premises:

- o This guideline applies to those dispensers that do not have dual-price-computing capabilities (otherwise there would be no need for policy/guidelines covering a cash discount chart).
- o A "chart expressed in terms of...the total cash discount applicable" is to be used to compute a final cash price.

Therefore, this policy/guideline is intended to indicate that the pump computer should be set at the credit card (higher) price. In fact, all the oil company practices in the early stages of cash discount marketing conformed to this approach.

Arguments against this policy/guideline are:

- (a) Some gas stations do 90% of their business as cash sales, so that the majority of customers are not speedily served unless the cash price is automatically computed on the dispenser pump.

In the opinion of the Committee, this argument would suggest that stations doing perhaps 90% of their business as cash should dedicate certain pumps to cash sales.

- (b) Any errors that occur if the cash price were the one set on the dispenser computer would usually be in the favor of the customer (if the higher credit card price were not computed and the dispenser computed price were taken as the final price).
- (c) Customers do not always receive their discount if unscrupulous attendants tell them that the credit card price computed is the final cash price or if the customer does not request the cash price.

As for the last two arguments above, the Committee members believe that the lack of uniformity in marketing motor fuel, when some marketers set their computers at the cash price and others at the credit card price, will in itself generate confusion and mistrust on the part of customers.

Because of the relatively earlier and more widespread practice of setting the dispenser computer at the credit card price and because adding an extra charge for the use of a credit card may be perceived as a surcharge, the Committee rejects the arguments against the Conference recommendation to set the dispenser computer at the credit card price and reaffirms the Conference policy and guidelines adopted last year.

(Item 207-1 was adopted.)

207-2 METHOD OF SALE OF ALCOHOL IN MOTOR FUEL

Representatives of the Northwest Conference on Weights and Measures request that motor fuel containing alcohol be so labeled.

Although alcohol has been used in motor fuels for some years, some serious problems have come to light more recently when large amounts of methanol or ethanol are present. Alcohols can act as solvents dissolving materials that have accumulated on the storage tank walls. Separation of the motor fuel and alcohol can occur if the fuel-alcohol blend comes in contact with significant amounts of moisture.

Finally, the physical characteristics of alcohol-fuel blends may have harmful effects upon vehicle performance. Dissolved materials from storage tanks and water absorbed by the alcohol-fuel blend will also affect vehicle performance adversely.

The purpose of identifying motor fuel as containing alcohol is to inform the customer when significant levels of alcohol are present in the motor fuel.

The questions with which the Committee has had to contend are:

- (1) What is the "significant" amount of alcohol that should trigger a labeling requirement? (The Committee did not wish to involve itself with labeling of very small amounts of alcohol.)
- (2) Which alcohols (methanol, ethanol, butyl, etc.) should be labeled? (Which are the "bad actors" in alcohol-blended fuels?)
- (3) If labeling is required, will the States have to acquire motor fuel quality testing facilities in order to determine compliance?

In order to answer these questions, the Committee makes the following information available to the Conference:

To control nitrous oxides, emissions from evaporation, driveability, and materials compatibility problems, the Environmental Protection Agency, (EPA), under its authority in the Clean Air Act (Section 211(f)), has approved the use of alcohol and certain other oxygen-containing chemicals (all, including alcohol, termed "oxygenates") in unleaded gasoline in amounts up to 2% by weight of oxygen.

If methanol alone is present in unleaded gasoline, EPA limits the amount of methanol permitted to 0.3% by volume (this is a much lower level than the 2% oxygen by weight rule would have permitted). If methanol is blended with another higher molecular weight alcohol, as much as 2.75% methanol by volume may be used.

Although the parallels with motor fuels other than unleaded gasoline are far from clear, the Committee viewed the EPA requirements as a basis for deciding what is a "significant" amount of alcohol (or oxygenates) for labeling purposes. In addition, from the EPA requirements and from information from State motor fuel testing labs, the Committee members are of the opinion that methanol with no higher alcohol added (as a "cosolvent") is the chief "bad actor" to be controlled, but that ethanol in some instances can also cause serious problems. The effects of the other alcohols is much less clear cut.

As to the question of what problems a motor fuel labeling requirement will pose to the States, the Committee is informed that 38 States have motor fuel requirements but that probably no more than 20 States have motor fuel testing facilities related to their weights and measures functions. This may indicate that a clear majority of State Weights and Measures agencies may not be in a position to check for compliance

with motor fuel labeling requirements. However, it should be pointed out that general product identity requirements for motor fuel in Handbook 44 (LMD Code S.1.4.3) and for other commodities in Handbook 130 have been generally adopted by the States even though some States may not have had the capability to test for compliance with every detail of the label.

The Committee also points out that States are not precluded from taking product samples to private testing laboratories when complaints or other problems surface.

Nevertheless, because of the lack of clear-cut figures to propose for amounts of alcohol above which labeling should be required, the Committee proposes a guideline for labeling and requests further input from industry and governmental officials as to the need for a section in the Model State Method of Sale of Commodities Regulation or other action.

It must be stressed that the Committee has no intention of proposing limits to the amounts of these substances to be added to motor fuel, only to require disclosure of their presence in motor fuel on the dispenser face. The Committee also wishes to affirm its endorsement of standards expected to be issued by the American Society for Testing and Materials. It is because these standards have not been issued that the Committee believes the guideline is needed.

Although the Committee proposed labeling guidelines in its interim and final report paralleling EPA requirements under the Clean Air Act, the Committee and Conference were persuaded by an eloquent address by Mr. N. D. Smith, State Representative from North Carolina, to amend the Committee's final report. The following represents the substance of his remarks and is incorporated as the Committee's report.

Since the 1930's the State of North Carolina has operated a motor fuels testing program. Our 1983-84 budget for this program is almost \$2,000,000 and includes a staff of analytical chemists and chemical engineers. In terms of operation and effectiveness, our program is very similar to the programs in Florida, Arkansas, and California.

Many on our staff are very active in ASTM and indeed serve on various ASTM petroleum committees. Our petroleum testing program operates under the authority of a Gasoline and Oil Inspection Board which is composed of people knowledgeable of the petroleum industry. Thus, we are not to be considered a fly-by-night organization or one that has no knowledge of the testing of motor fuels.

Ladies and gentlemen of this Conference, we (North Carolina) have held public hearings on specifications for alcohol-gasoline fuels and we have heard all the arguments on why alcohol fuels should not be singled out for special labeling. Notwithstanding the arguments of Syd Andrews* and others, we feel it is time to stand up and be counted. We hold that it

is a fundamental right for the purchasers of motor fuels to know if a fuel contains significant amounts of alcohol. With the motor vehicle manufacturers limiting new car warranties when alcohol fuels are used, it is imperative that a fuel purchaser be advised of the presence of alcohol. Even with older cars, there may be problems with using alcohol fuels which affect filters and driveability. While these particular problems may not constitute a permanent injury to the engine, they are still a nuisance and extra expense to the vehicle owner which could have been avoided if the presence of alcohol was declared. After all, the proposed action by Chrysler establishes the need for labeling. Whether you agree with Chrysler** or not, Chrysler has established a policy on vehicle warranties and alcohol fuels that can not be ignored.

Having said all this, I must agree with Syd Andrews that this is a complex problem which should be dealt with by experts. However, as weights and measures officials we are most often the sounding board for consumer complaints and perhaps the first group to learn of new marketing techniques or strategies. Thus, I feel that it is the responsibility of this Conference to clearly send a message to the experts so they will be moved to declare the suitability of alcohol-gasoline motor fuels.

While I feel the Committee has done an excellent job in the face of conflicting testimony, I feel the alcohol percentages are too high. It is certainly easier to start with a tight labeling requirement and soften it as more information is developed than to start with a soft requirement and tighten it later.

I move to amend the Committee on Laws and Regulations recommended guideline by striking the entire Laws and Regulations guideline and substituting the following:

"All motor fuel kept, offered, or exposed for sale, or sold containing at least one percent by volume ethanol or methanol should be identified on the motor fuel dispenser as "with" or "containing" ("ethanol"), ("methanol") or ("ethanol/methanol") or similar wording.

*Director, Florida Division of Standards. He argued that weights and measures jurisdictions should not involve themselves in questions of quality, and that ASTM has been working on and has not solved this problem in many years.

**Chrysler Motor Co. proposes limiting its new car warranties excluding coverage of repairs if gasoline containing methanol is used.

(Item 207-2 as amended was adopted.)

207-3 METHOD OF SALE OF CLAMS, MUSSELS, AND OYSTERS

(This item was carried over from the 67th NCWM, 1982, in which it was assigned voting key 206-4)

The Committee recommends the following methods of sale for clams, mussels, and oysters. Because there is a conflict between existing trade practices in some areas of the country (selling whole clams, oysters, or mussels in the shell by weight) and what is being proposed below, the Committee proposes the following to be a guideline rather than as part of the Model State Regulation for the Method of Sale of Commodities. The Committee invites further comment from any interested party.

Guideline for Method of Sale of Clams, Mussels and Oysters

1. *Stuffed clams or mussels on the half shell should be sold by net weight excluding the weight of the shell.*
2. *Canned (heat-processed) oysters should be sold by net weight.*
3. *Fresh oysters, clams, or mussels removed from the shell and placed in a container should be sold by fluid volume.*
4. *Frozen oysters, clams, or mussels should be sold by net weight.*
5. *Whole clams, oysters, or mussels in the shell (fresh or frozen) should be sold by dry measure (e.g., bushel) or count plus size, not by net weight.*

During the discussions on this item at the interim meeting, it was asked what the maximum amount of free liquid is permitted to be in fresh oysters, clams, or mussels removed from the shell and sold by fluid volume (item 3 above). It was reported that regulations of the Food and Drug Administration (21 CFR 161.130) permit 5 percent liquid by weight for oysters. However, Alabama and New York reported permitting 10 percent free liquid, and Louisiana 15 percent. The amount of free liquid permitted for clams and mussels is not standardized by Federal regulations.

(Item 207-3 was adopted as part of the consent calendar.)

207-4 METHOD OF SALE OF VEGETABLE OIL

Packages of liquid vegetable oil are being sold for restaurant and other small food business use labeled by weight. It has been brought to the attention of the Committee that containers of product labeled "5 gallons" look identical in dimensions to those labeled "35 pounds", but the density of the vegetable oil is such that the 35-pound cans contain only about 4 1/2 gallons. The Institute of Shortening and Edible Oils indicates that companies selling liquid vegetable oils often compete with those selling solid shortening, and that a net weight comparison is useful for these purposes. Recipes for food products in large sizes sometimes provide ingredient quantities by weight or by volume.

It is the opinion of the members of the Committee that packaged liquid vegetable oil must be labeled by liquid volume, although a net weight may be declared in addition to the net volume statement.

When a single manufacturer of vegetable oil packages the same oil in the same size container with two such widely different net quantity statements, this practice could easily be considered (a) misleading to the customer, and (b) nonfunctional slack-fill. Weights and measures enforcement action should be taken.

(Item 207-4 was adopted as part of the consent calendar.)

207-5 METHOD OF SALE OF POTPOURRI

Minnetonka, Inc. (Minnetonka, MN) manufacturers a line of fragrant dried herbs and flowers ("Pot Pourri") used for their decorative nature and fragrance, and sold from bulk and in prepackaged form. The Federal Trade Commission (FTC) has communicated with Minnetonka and is of the opinion that the prepackaged potpourri put up in decorative containers can be considered as an air freshener unit and, therefore, no net contents statement would be required (because FTC has ruled similarly for incense and other air fresheners).

The Southern Weights and Measures Association has requested the NCWM to resolve the conflict between Section 13 of the Model State Weights and Measures Law (requiring a quantity of contents statement in terms of weight, measure, or count) and the FTC opinion.

The Liaison Committee and Committee on Laws and Regulations met jointly to consider this issue. Neither Committee saw conflict between the FTC opinion and the Model Law. Section 11 of the Model Law states in part "... commodities not in liquid form shall be sold only by weight, or by measure, or by count, so long as the method of sale provides accurate quantity information." The quantity of air freshener or incense in decorative containers does not directly translate into easily measurable units such as weight or volume, so count (e.g., "one") appears to be a minimally acceptable declaration of net contents. This is the interpretation of the FTC.

Sale of potpourri from bulk has been made by weight or by dry measure. Questions of how to sell the product from bulk arose because the company was informed by weights and measures officials that they were supplying scales that would not meet the requirements of Handbook 44. The company sells their product in boutiques and department stores, most of which are not equipped with suitable scales. Therefore, Minnetonka had to supply a measuring device with its bulk potpourri. Since the fragrance and visual appearance of the product are the main reasons for consumer purchases, the dry volume of product seemed to be an alternative and adequate method of sale (since the volume is related to the surface area exposed which in turn is related to the amount of fragrance given off). Minnetonka had volumetric measures fabricated and sent to the National

Bureau of Standards for type approval. The dry volume measures hold 1/8 and 1/4 dry pint and have been issued reports of test. These dry volume measures were fabricated for Minnetonka and are not available to the commercial trade, so far as the Committee is aware.

The Committee would like to alert field officials to the likelihood of these and other commodities being sold by weight or measure from bulk in department stores and other retail outlets not usually recognized as locations where commercial measuring equipment would be present.

The remaining problem is, of course, the fact that the prepackaged material in decorative containers may contain no declaration of weight or volume (per FTC information), whereas the material sold from bulk will be measured by dry volume. This will be a problem for consumers who wish to make a value comparison between the prepackaged product and that sold from bulk. Minnetonka, Inc. is studying the feasibility of putting a declaration of net contents on their prepackaged product in terms of dry volume.

The Committee recommends that potpourri be sold either by weight or by dry measure either when sold from bulk or when prepackaged and not in decorative containers.

(Item 207-5 was adopted.)

208

GENERAL

*208-1 TASK FORCE ON PACKAGE CONTROL

The Committee met jointly with the Liaison Committee to receive a progress report from the Task Force on Package Control. This progress report is included in the Liaison Committee's report, reference key 505.

Although the work and recommendations of the Task Force may have long-reaching implications for weights and measures inspection activities, there is nothing in the objectives or agenda of the Task Force that proposes modification or revision of the model laws or regulations. The Committee intends to follow the progress of the Task Force and participate in its activities as far as possible given the constraints of concurrent meeting schedules during the Conference and Interim Meeting Weeks.

208-2 LONG RANGE PLAN

Committee members agreed on goals and objectives for the Committee and approved a five-year plan towards achieving these objectives. The goals and objectives are presented below. Members of the Committee believe that it is important for the entire Conference to participate in goal setting and planning for each Committee and requests that the Conference endorse the goals and objectives of the Committee.

208-2-1 GOALS AND OBJECTIVES OF THE COMMITTEE ON LAWS AND REGULATIONS

Goals

- o To achieve marketplace equity and uniformity,
- o Minimize opportunities for unfair or deceptive commerce concerning weight or measures, and
- o Remove impediments to interstate commerce and encourage economic growth, while protecting the consumer.

Objectives

1. Review (and revise where necessary) existing model laws and regulations for their suitability in the modern marketplace and for their compatibility with other Federal and State laws;
2. Encourage the promulgation of model laws and regulations by State and local government (including development of efficient means for the States to adopt these models and keep them current);
3. Determine the need for and develop new model laws and regulations (or portions of such) for use by the State and local governments;
4. Determine the level of conformity of State laws and regulations with existing NCWM model laws and regulations;
5. Provide guidance on the use of weights and measures laws and regulations so as to increase the uniformity of application and interpretation of the model laws and regulations.

(Item 208-2-1 was adopted as part of the consent calendar.)

*208-2-2 TASKS OF THE COMMITTEE ON LAWS AND REGULATIONS

The Committee intends to continue its review of existing model laws and regulations for their suitability in the modern marketplace. The work on the Model State Regulation for the Voluntary Registration of Servicepersons and Service Agencies for Commercial Weighing and Measuring Devices and the Model State Open Dating Regulation is part of that activity. Based on the intercomparison of the Model State Regulation for the Method of Sale of Commodities with existing regulations, the Committee believes this model regulation needs serious attention by the Conference as well, and plans to undertake this task in the near future.

The Committee also intends to survey the States in order to determine the extent of weights and measures authority in the following areas:

- petroleum quantity and quality
- pricing and advertising
- package inspection
- unit pricing and open dating

*208-3 MULTI-UNIT, COMBINATION, AND VARIETY PACKAGES/ALL UNITS
CLEARLY VISIBLE

New Jersey Weights and Measures and Pine Consultants, Inc. have begun discussions with the Committee concerning a recurring problem to the weights and measures community: the proper labeling of multi-unit, combination and variety packages (see sections 10.4 through 10.6 of the Model State Packaging and Labeling Regulation). Currently, the model regulation requires a total quantity statement of the entire contents on the labels of these types of packages. The question has been posed to the Committee as to the need for a total quantity statement if two other conditions are met:

- (1) the outer wrapping of the multi-unit, combination, or variety package is completely transparent, and
- (2) each individual item inside the multi-unit, combination, or variety package meets all labeling requirements including net contents declarations and the labeling of each unit is completely visible.

Pine Consultants, Inc. made available to the Committee copies of the Food and Drug Administration provision for this type of packaging of multi-unit packages (21CFR101.105(s)) (underlining added):

On a multiunit retail package, a statement of the quantity of contents shall appear on the outside of the package and shall include the number of individual units, and, in parentheses, the total quantity of contents of the multiunit package in terms of avoirdupois or fluid ounces, except that such declaration of total quantity need not be followed by an additional parenthetical declaration in terms of the largest whole units and subdivisions thereof, as required by paragraph (j)(1) of this section. A multiunit retail package may thus be properly labeled: "6-16 oz bottles-(96 fl oz): or "3-16 oz cans--(net wt. 48 oz)". For the purposes of this section, "multiunit retail package" means a package containing two or more individually packaged units of the identical commodity and in the same quantity, intended to be sold as part of the multiunit retail package but capable of being individually sold in full compliance with all requirements of the regulations in this part. Open multiunit retail packages that do not obscure the number of units or prevent examination of the labeling on each of the individual units are not subject to this

paragraph if the labeling of each individual unit complies with the requirements of paragraphs (f) and (i) of this section. The provisions of this section do not apply to butter or margarine covered by the exemptions in 1.24(a) (10) and (11) of this chapter.

Because this issue was brought to the Committee after the deadline for submission of agenda topics, and because of the need for further study, the Committee is not prepared to propose specific changes to the Model at this time. However, the Committee would like to point out that it does favor extension of this rule, which FDA has applied to multi-unit (same commodity) packages, to combination and variety packages as well. The Committee welcomes comment on this item and recommends carrying the item over until next year.

J. J. Bartfai, New York, Chairman
G. E. Mattimoe, Hawaii
W. R. Mossberg, Los Angeles County, CA
E. P. Skluzacek, Minnesota
D. E. Stagg, Alabama
C. S. Brickenkamp, Technical Advisor, NBS
A. D. Tholen, Executive Secretary, NCWM

COMMITTEE ON LAWS AND REGULATIONS

REPORT OF THE COMMITTEE ON SPECIFICATIONS AND TOLERANCES

Presented by L. H. DeGrange, Assistant Chief, Weights and Measures,
Department of Agriculture, State of Maryland

VOTING KEY

300

INTRODUCTION

The Committee on Specifications and Tolerances submits its report to the 68th National Conference on Weights and Measures. The report consists of the interim meeting report as offered in the Conference Announcement and as amended by the final report.

The report comprises recommendations of the Committee that have been formed on the basis of written and oral comments received during the year and oral presentations made during the Committee discussion session at the Conference. All recommended amendments are to appropriate provisions of National Bureau of Standards Handbook 44, 1983 edition, "Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices."

NOTE: Except where paragraphs are to be added or completely revised as indicated, changes are shown as follows: that which is to be deleted is shown lined out, and that which is to be added is underlined.

The report includes thirty-five Reference Key Items. Of these items some are recommendations for a specific action by the Conference and are to be voted on; the others are informational items only and are not subject to vote. Those items marked with an asterisk are informational items. The items to be voted on are:

- 301-2 Precision Balances
- 301-3 Automatic Bulk Weighing Systems
- 301-4 UR.1.1.4. Value of the Scale Division/For Grain Hopper Scales
- 301-5 S.1.1. Zero Indication-Positive Value/No-Load Reference
- 301-7 UR.3.5. Single-Draft Vehicle Weighing
- 301-8 Menu Service Scales
- 301-11 UR.2.6.1. Approaches/To Vehicle Scales
- 301-12 T.3.8.4. Weighing Coupled In Motion Used For Unit Train Weights
- 301-14 Report of the National Type Evaluation Technical Committee (NTETC)
- 303-1 Retail Motor Fuel Devices - Dispenser/Console Money - Value Division Agreement
- 303-2 Certain Devices Used to Measure Kerosene
- 303-3 N.4.2.2. Specific Tests/For Retail Motor-Fuel Devices
- 303-7 Report of the National Type Evaluation Technical Committee
- 304-1 Temperature Compensation
- 304-2 S.1.4.1. Computing-Type Devices/Display of Unit Price

305	Section 3.34. Cryogenic Liquid-Measuring Devices
306-1	S.3.5.2. Gage Tube
307	Section 5.55. Code for Timing Devices
308-2	Status of Advisory Committee on Grain Moisture Measurement
310-1	Nonretroactive Requirements

The following items have been placed on the consent calendar and are to be voted on in a single ballot:

301-2	303-3	306-1
301-4	303-7	307
301-12	304-2	308-2
301-14	305	310-1

(A motion was made and passed to remove item 307 from the consent calendar. All of the remaining items on the consent calendar were adopted.)

301

SECTION 2.20. SCALES

*301-1 SCALE CODE FORMAT AND TOLERANCES

The reports of the Committee for the last several years have included informational references on this subject. Considerable time and effort have been expended by many individuals in the development of a practical, equitable, easy to use Code that is compatible with OIML International Recommendations, yet recognizes U.S. needs and practices. The organizations and individuals contributing to this effort are too numerous to mention here, but have been recognized in past reports.

During the last several years, tutorial presentations to provide a clear understanding of the principles of proposals have been made at State and regional Conferences for which the committee wishes to express its appreciation to SMA. As a result, suggestions for changes have been made and included in subsequent proposals. It has become evident from these recommendations that considerable thought, time, and effort have been spent in the review of these draft proposals, and that a better understanding does exist.

The Committee considers that the draft code that follows is approaching final form and presents it as an informational item once again for consideration by the Conference. It is the view of the Committee that this draft, with a few changes that may result from this years Conference action on certain items applicable to the existing Code and some additional editing, will be ready for action by next year's Conference for implementation January 1, 1986. There is also a need to provide a few non-retroactive clauses for certain devices that will not fit into the new class structure.

SEC. 2.20. SCALES

A. APPLICATION

A.1. GENERAL.- This code applies to all types of weighing devices other than belt-conveyor scales. The code comprises requirements that are generally applicable to all weighing devices, and specific requirements that are applicable only to certain types of weighing devices.

A.2. WHEEL-LOAD WEIGHERS AND AXLE-LOAD SCALES.- The requirements for wheel-load weighers and axle-load scales apply only to such scales in official use for the enforcement of traffic and highway laws or for the collection of statistical information by government agencies.

A.3. - See also General Code requirements.

S. SPECIFICATIONS

S.1. DESIGN OF INDICATING AND RECORDING ELEMENTS AND OF RECORDED REPRESENTATIONS.

S.1.1. ZERO INDICATION.- Provision shall be made on a scale equipped with indicating or recording elements to either indicate or record a zero balance condition, and on an automatic-indicating scale or balance indicator to indicate or record an out-of-balance condition on both sides of zero.

S.1.1.1. DIGITAL INDICATING ELEMENTS.- A digital zero indication shall represent a balance condition that is within plus or minus one-half the value of the scale division. On a digital indicator equipped with an auxiliary or supplemental "center of zero" indicator, this indicator shall define a zero balance condition to $\pm 1/4$ of a scale division or better.

S.1.2. *Except for scales and weighing systems used exclusively for weighing in predetermined amounts (i.e., batching scales), the value of a scale division (d) expressed in a unit of weight shall be equal to;*

- a. 1, 2, or 5, or
- b. a decimal multiple or submultiple of 1, 2, or 5; or
- c. a binary submultiple of a specific unit of weight.

Examples: scale divisions may be .01, .02, .05; .1, .2, or .5; 1, 2, or 5; 10, 20, 50, or 100; or, scale divisions may be 1/2, 1/4, 1/8, 1/16, etc. (non-retroactive as of January 1, 1985)

S.1.3. GRADUATIONS.

S.1.3.1. LENGTH.- Graduations shall be so varied in length that they may be conveniently read.

S.1.3.2. WIDTH.- In any series of graduations, the width of a graduation shall in no case be greater than the width of the minimum clear interval between graduations, and the width of main graduations shall be not more than 50 percent greater than the width of subordinate graduations. Graduations shall in no case be less than 0.008 inch in width.

S.1.3.3. CLEAR INTERVAL BETWEEN GRADUATIONS.- The clear interval shall be not less than 0.02 inch for graduations representing money values and not less than 0.03 inch for other graduations. If the graduations are not parallel, the measurement shall be made

- (a) along the line of relative movement between the graduations and the end of the indicator, or
- (b) if the indicator is continuous, at the point of widest separation of the graduations.

S.1.4. INDICATORS.

S.1.4.1. SYMMETRY.- The index of an indicator shall be symmetrical with respect to the graduations with which it is associated and at least throughout that portion of its length that is associated with the graduations.

S.1.4.2. LENGTH.- The index of an indicator shall reach to the finest graduations with which it is used, unless the indicator and the graduations are in the same plane, in which case the distance between the end of the indicator and the ends of the graduations, measured along the line of the graduations, shall be not more than 0.04 inch.

S.1.4.3. WIDTH.- The width of the index of an indicator in relation to the series of graduations with which it is used shall be not greater than

- (a) the width of the widest graduation,
- (b) the width of the minimum clear interval between weight graduations, and
- (c) three-fourths of the width of the minimum clear interval between money-value graduations.

When the index of an indicator extends along the entire length of a graduation, that portion of the index of the indicator that may be brought into coincidence with the graduation shall be of the same width throughout the length of the index that coincides with the graduation.

S.1.4.4. CLEARANCE.- The clearance between the index of an indicator and the graduations shall in no case be more than 0.06 inch.

S.1.4.5. PARALLAX.- Parallax effects shall be reduced to the practicable minimum.

S.1.5. WEIGHBEAMS.

S.1.5.1. NORMAL BALANCE POSITION.- The normal balance position of the weighbeam of a beam scale shall be horizontal.

S.1.5.2. TRAVEL.- The weighbeam of a beam scale shall have equal travel above and below the horizontal. The total travel of the weighbeam of a beam scale in a trig loop or between other limiting stops near the weigh-beam tip shall be not less than the minimum travel shown in table 1. When such limiting stops are not provided, the total travel at the weighbeam tip shall be not less than 8 percent of the distance from the weigh beam fulcrum to the weighbeam tip.

TABLE 1.- MINIMUM TRAVEL OF WEIGHBEAM OF BEAM SCALE BETWEEN LIMITING STOPS.

Distance from weighbeam fulcrum to limiting stops	Minimum travel between limiting stops
Inches	Inch
12 or less.....	0.4
13 to 20, incl.....	0.5
21 to 40, incl.....	0.7
Over 40.....	0.9

S.1.5.3. SUBDIVISION.- A subdivided weighbeam bar shall be subdivided by means of graduations, notches, or a combination of both. Graduations on a particular bar shall be of uniform width and perpendicular to the top edge of the bar. Notches on a particular bar shall be uniform in shape and dimensions and perpendicular to the face of the bar. When a combination of graduations and notches is employed, the graduations shall be so positioned in relation to the notches as to indicate notch values clearly and accurately.

S.1.5.4. READABILITY.- A subdivided weighbeam bar shall be so subdivided and marked, and a weighbeam poise shall be so constructed, that the weight corresponding to any normal poise position can easily and accurately be read directly from the beam, whether or not provision is made for the optional recording of representations of weight.

S.1.5.5. CAPACITY.- On an automatic-indicating scale having a nominal capacity of 30 pounds or less and used for direct sales to retail customers,

- (a) the capacity of any weighbeam bar shall be a multiple of the reading-face capacity,
- (b) each bar shall be subdivided throughout or shall be subdivided into notched intervals each equal to the reading-face capacity, and
- (c) the value of any turnover poise shall be equal to the reading-face capacity.

S.1.5.6. POISE STOP.- Except on a steelyard with no zero graduation, a shoulder or stop shall be provided on each weighbeam bar to prevent a poise from traveling and remaining back of the zero graduation.

S.1.6. POISES.

S.1.6.1. GENERAL.- No part of a poise shall be readily detachable. A locking screw shall be perpendicular to the longitudinal axis of the weighbeam and shall not be removable. Except on a steelyard with no zero graduation, a poise shall not be readily removable from a weighbeam. The knife edge of a hanging poise shall be hard and sharp and so constructed as to allow the poise to swing freely on the bearing surfaces in the weighbeam notches.

S.1.6.2. ADJUSTING MATERIAL.- The adjusting material in a poise shall be securely enclosed and firmly fixed in position, and if softer than brass it shall not be in contact with the weighbeam.

S.1.6.3. PAWL.- A poise, other than a hanging poise, on a notched weighbeam bar shall have a pawl that will seat the poise in a definite and correct position in any notch, wherever in the notch the pawl is placed, and hold it there firmly and without appreciable movement. That dimension of the tip of the pawl that is transverse to the longitudinal axis of the weighbeam shall be at least equal to the corresponding dimension of the notches.

S.1.6.4. READING EDGE OR INDICATOR.- The reading edge or indicator of a poise shall be sharply defined, and a reading edge shall be parallel to the graduations on the weighbeam.

S.1.7. CAPACITY INDICATION, WEIGHT RANGES, AND UNIT WEIGHTS.- Except for single or multi-revolution dial scales not equipped with unit weights, scales equipped with two or more weighbeams, or mathematically derived totalized values, an indicating or recording element shall not display or record any values when the gross platform load is in excess of 105% of the capacity of the system. The total value of weight ranges and of unit weights in effect or in place at any time shall automatically be accounted for on the reading face and on any recorded representation.

S.1.8. FOR COMPUTING SCALES ONLY.

S.1.8.1. MONEY-VALUE GRADUATIONS.- The value of the graduated intervals representing money values on a computing scale with analog indications shall be as follows:

- (a) Not more than 1 cent at all unit prices of 25 cents per pound and less.
- (b) Not more than 2 cents at unit prices of 26 cents per pound through \$1.25 per pound. (Special graduations defining 5-cent intervals may be employed, but not in the spaces between regular graduations.)
- (c) Not more than 5 cents per unit prices of \$1.26 per pound through \$3.40 per pound.
- (d) Not more than 10 cents at unit prices above \$3.40 per pound.

Value figures and graduations shall not be duplicated in any column or row on the graduated chart. (See also Sec. 1.14; G-S.5.5., and S.1.8.2.)

S.1.8.2. MONEY-VALUE COMPUTATION.- A computing scale with analog quantity indications used in retail trade may compute and present digital money values to the nearest quantity graduation when the value of the minimum graduated interval is 0.01 pound or less. (See also Sec. 1.14; G-S.5.5.)

S.1.8.3. CUSTOMER'S INDICATIONS.- Weight indications shall be shown on the customer's side of computing scales when these are used for direct sales to retail customers. Computing scales equipped on the operator's side with digital indications, such as the net weight, price per pound, or total price, shall be similarly equipped on the customer's side. Unit price displays visible to the customer shall be in terms of the price per pound and not in fractions or multiples of a pound.

S.1.8.4. RECORDED REPRESENTATIONS, POINT OF SALE SYSTEMS.- The sales information recorded by cash registers when interfaced with a weighing element shall contain the following information for items weighed at the checkout stand:

- (a) the net weight,¹
- (b) the unit price,¹
- (c) the total price, and
- (d) the product class or, in a system equipped with price look-up capability, the product name or code number.

¹Weight values shall be identified by the word "pound", the symbol "lb", or the sign "#".

S.1.9. FOR PREPACKAGING SCALES ONLY.

S.1.9.1. VALUE OF THE SCALE DIVISION.- On a prepackaging scale, the value of the intervals representing weight values shall be uniform throughout the entire reading face, and any recorded representation shall present weight values identical with those on the reading face.

S.1.9.2. LABEL PRINTER.- A prepackaging scale that, as part of the scale itself or of any auxiliary device attached thereto or used in connection therewith, produces a printed ticket to be used as the label for a package shall print all values digitally and of such size, style of type, and color as to be clear and conspicuous on the label.

S.1.10. PROVISION FOR SEALING ADJUSTABLE COMPONENTS ON ELECTRONIC DEVICES.- *Except on Class I scales, provision shall be made for applying a security seal in a manner that requires the security seal to be broken before an adjustment can be made to any component affecting the performance of an electronic device. (Nonretroactive as of January 1, 1979.)*

S.2. DESIGN OF BALANCE, TARE, LEVEL, DAMPING, AND ARRESTING MECHANISMS.

S.2.1. ZERO-LOAD ADJUSTMENT.

S.2.1.1. GENERAL.- A scale shall be equipped with means by which the zero-load balance may be adjusted, and any loose material used for this purpose shall be so enclosed that it cannot shift in position in such a way that the balance condition of the scale is altered.

S.2.1.2. ON SCALES USED IN DIRECT SALES.- A manual zero setting mechanism (except on a digital scale with an analog zero adjustment mechanism with a range of not greater than one scale division) shall be operable or accessible only by a tool outside of and entirely separate from this mechanism, or enclosed in a cabinet. Except on Class I or II scales, a balance ball shall either meet this requirement or not itself be rotatable.

A semi-automatic zero setting mechanism shall be operable or accessible only by a tool outside of and entirely separate from this mechanism or enclosed in a cabinet, or shall be operable only when the indication is stable within:

- (a) Plus or minus 3 scale divisions for scales of more than 5000 pounds capacity in service prior to January 1, 1981 and for all axle load, railway track, and vehicle scales.
- (b) Plus or minus 1 scale division for all other scales.

S.2.1.3. ON SCALES EQUIPPED WITH AN AUTOMATIC ZERO SETTING MECHANISM.- Under normal operating conditions the maximum load that can be "rezeroed" when all at once either placed on or removed from the platform shall be:

- (a) For bench, counter, and livestock scales - 0.6 scale division,*
- (b) For axle load, railway track, and vehicle scales - 3.0 scale divisions,*
- (c) For all other scales - 1.0 scale division.*

(Nonretroactive and enforceable as of January 1, 1981.)

S.2.1.4. ON MONORAIL SCALES.- On a monorail scale equipped with digital indications, means shall be provided for setting the zero-load balance to within 0.02% of scale capacity. On an in-motion system, means shall be provided to automatically maintain these conditions.

S.2.2. BALANCE INDICATOR.- On a balance indicator consisting of two indicating edges, lines, or points, the ends of the indicators shall be sharply defined and shall be separated by not more than 0.04 inch, measured horizontally, when the scale is in balance.

S.2.2.1. ON DAIRY-PRODUCT-TEST, GRAIN-TEST, PRESCRIPTION, AND CLASS I AND II SCALES ONLY.- Except on digital indicating devices, a dairy-product-test, grain-test, prescription, or Class I or II scale shall be equipped with a balance indicator. If this consists of an indicator and a graduated scale that are not in the same plane, the clearance between the indicator and the graduations shall be not more than 0.04 inch.

S.2.3. TARE.- On any scale, (except a monorail scale equipped with digital indications) the value of the tare division shall be equal to the value of the scale division. The tare mechanism shall operate only in a backward direction (that is, in a direction of underregistration) with respect to the zero load balance condition of the scale. On a device designed to automatically clear any tare value entered, means shall be provided to prevent the clearing of tare until a complete transaction has been indicated.* (*Non-retroactive as of January 1, 1983.)*

Note: On a computing scale this requires the input of a unit price and the display of the unit price and a computed positive total price at a readable equilibrium. On other devices it requires a complete weighing operation, including a tare, net, and gross weight determination.

S.2.3.1. ON MONORAIL SCALES EQUIPPED WITH DIGITAL INDICATIONS.- On a monorail scale equipped with digital indications means shall be provided for setting any tare value of less than five percent of the scale capacity to within 0.02% of scale capacity. On an in-motion system means shall be provided to automatically maintain this condition.

S.2.4. LEVEL-INDICATING MEANS.- If the weighing performance of a portable scale (*except a prescription, jewelers, dairy product-test, or Class I or II scale*) is changed by an amount greater than the appropriate acceptance tolerance when it is moved from a level position and rebalanced in a position that is out of level in any upright direction by 5 percent or approximately 3 degrees, the scale shall be equipped with level-indicating means. The indications of this level-indicating means shall be readily observable without the necessity of disassembly of any scale parts requiring the use of mechanical means separate from the scale. (*For excepted scales, this requirement will be non-retroactive and enforceable as of January 1, 1985.*)

S.2.5. DAMPING MEANS.- An automatic-indicating scale, and balance indicator, shall be equipped with effective means for damping the oscillations whenever such means are necessary to bring the indicating elements quickly to rest.

S.2.5.1. ELECTRONIC ELEMENTS.- Electronic indicating elements equipped with recording elements shall be equipped with effective means to permit the recording of weight values only when the indication is stable within:

- (a) Plus or minus 3 scale divisions for scales of more than 5000 pounds capacity in service prior to January 1, 1981 and for all axle load, railway track, livestock, and vehicle scales.
- (b) Plus or minus 1 scale division for all other scales.

The values recorded shall be within applicable tolerances.

S.2.5.2. ON JEWELERS, PRESCRIPTION, AND CLASS I AND CLASS II SCALES ONLY.- A jewelers, prescription, and Class I and Class II scale shall be equipped with appropriate means for arresting the oscillation of the mechanism.

S.3. DESIGN OF LOAD-RECEIVING ELEMENTS.

S.3.1. TRAVEL OF PANS OF EQUAL-ARM SCALE.- The travel between limiting stops of the pans of a nonautomatic-indicating equal-arm scale not equipped with a balance indicator shall be not less than the minimum travel shown in table 2.

TABLE 2.- MINIMUM TRAVEL OF PANS OF NONAUTOMATIC INDICATING EQUAL-ARM SCALE WITHOUT BALANCE INDICATOR.

Nominal Capacity	Minimum
Pounds	travel of pans
	Inch
4 or less.....	0.35
5 to 12, incl.....	0.5
13 to 26, incl.....	0.75
Over 26.....	1.0

S.3.2. DRAINAGE.- A load-receiving element intended to receive wet commodities shall be so constructed as to drain effectively.

S.3.3. SCOOP COUNTERBALANCE.- A scoop on a scale used for direct sales to retail customers shall not be counter-balanced by a removable weight. A permanently attached scoop-counterbalance shall indicate clearly on both the dealer's and customer's sides of the scale whether it is positioned for the scoop to be on or off the scale.

S.4. DESIGN OF WEIGHING ELEMENTS.

S.4.1. ANTIFRICTION MEANS.- At all points at which a live part of the mechanisms may come into contact with another part in the course of normal usage, frictional effects shall be reduced to a minimum by suitable antifriction means; i.e., opposing surfaces and points shall be properly shaped, finished, and hardened. A platform scale having a frame around the platform shall be equipped with means to prevent interference between platform and frame.

S.4.2. ADJUSTABLE COMPONENTS.- An adjustable component such as a nose-iron, pendulum, spring, or potentiometer shall be held securely in adjustment and except for the level adjusting and zero load balance mechanisms shall not be adjustable from the outside of the scale. The position of a nose-iron on a scale of more than 2000-lb capacity, as determined by the factory adjustment, shall be accurately, clearly, and permanently defined.

S.4.3. MULTIPLE LOAD-RECEIVING ELEMENTS.- Except for mechanical bench and counter scales, a scale with a single indicating or recording element, or a combination indicating-recording element, that is coupled to two or more load-receiving elements with independent weighing systems shall be provided with means to prohibit the activation of any load-receiving element (or elements) not in use, and shall be provided with automatic means to indicate clearly and definitely which load-receiving element (or elements) is in use.

S.5. DESIGN OF WEIGHING DEVICES, ACCURACY CLASS.

S.5.1. Weighing devices are divided into accuracy classes and shall be designated as I, II, III, III L, or IIII.

S.5.2. The accuracy class as designated by the manufacturer is determined by table 3.

TABLE 3.- ACCURACY CLASSES

Class	Value of the Verification Scale Division (d or e*)	Number of Scale Divisions (n)	
		Minimum	Maximum
I	$d(e) \geq 0.001 \text{ g}$	50 000	--
II	$0.001 \text{ g} \leq d(e) \leq 0.05 \text{ g}$	100	50 000
	$d(e) \geq 0.1 \text{ g}$	5 000	50 000
III	$0.0002 \text{ lb} \leq d \leq 0.005 \text{ lb}$	100	10 000
	$0.005 \text{ oz} \leq d \leq 0.125 \text{ oz}$		
	$0.1 \text{ g} \leq d \leq 2.0 \text{ g}$	480	10 000
	$d \geq 0.01 \text{ lb}$		
III L	$d \geq 0.25 \text{ oz}$		
	$d \geq 5.0 \text{ g}$		
	$d \geq 5 \text{ lb}$	2 000	8 000
IIII	$d \geq 2 \text{ kg}$	100	1 000
	$d \geq 0.01 \text{ lb}$		
	$d \geq 0.25 \text{ oz}$		
	$d \geq 5.0 \text{ g}$		

*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.

NOTE: The symbols \leq and \geq mean "equal to and less than" and "equal to and more than" respectively. Thus, the term " $d \leq 5 \text{ lb}$ " means that d is equal to or less than 5 lb and the term " $d \geq 5 \text{ lb}$ " means that d is equal to or more than 5 lb.

S.6. MARKING REQUIREMENTS. (See also G-S.1.)

S.6.1.- ACCURACY CLASS.- The accuracy class of a device shall be marked on the identification plate required by G-S.1. with the appropriate designation as I, II, III, III L, or IIII.

S.6.2.- NOMINAL CAPACITY.- The nominal capacity shall be conspicuously marked as follows:

- On any scale equipped with unit weights or weight ranges.
- On any scale with which counterpoise or equal-arm weights are intended to be used.

- (c) On any automatic-indicating or recording scale so constructed that the capacity of the indicating or recording element or elements is not immediately apparent.
- (d) On any scale with a nominal capacity less than the sum of the reading elements.

S.6.3. VALUE OF THE SCALE DIVISION.- The value of the scale division shall be conspicuously marked adjacent to the weight display on any scale so constructed that the value of the scale division is not immediately apparent. This value shall be marked with the nominal capacity in the following manner as appropriate.

Capacity: 100,000 x 10 lb

Capacity: 30 x .01 lb

On multi-range devices or devices capable of indicating in two or more units each range and unit shall be marked. (Added and nonretroactive as of January 1, 1983.)

S.6.4. FOR PREPACKAGING SCALES ONLY.- A prepackaging scale shall be conspicuously marked on the operator's side and on the opposite side with the words "For Prepackaging Use Only" or with a similar and suitable statement.

(See the footnote following the section on user requirements in the Scale Code.)

S.6.5. FOR LIVESTOCK, VEHICLE, AND RAILWAY TRACK SCALES ONLY.- A livestock, vehicle, or railway track scale shall be marked with the maximum capacity of each section of the load-receiving element of the scale. Such marking shall be accurately and conspicuously presented on or adjacent to the identification or nomenclature plate that is attached to the indicating element of the scale.

S.6.6. FOR WEIGHING ELEMENTS.- On a weighing element not permanently attached to an indicating element, there shall be clearly and permanently marked for the purposes of identification the name, initials, or trademark of the manufacturer, the manufacturer's designation that positively identifies the pattern or design, and the nominal capacity.

N. NOTES

N.1. TESTING PROCEDURES.

N.1.1. INCREASING-LOAD-TEST.- An increasing load test shall be conducted on all scales with the test loads approximately centered on the load-receiving element of the scale, except on a scale having a nominal capacity greater than the total available known test load, in which case the available test load is used to greatest advantage by concentrating it, within prescribed load limits, over the main load supports of the scale.

N.1.2. DECREASING-LOAD TEST.- A decreasing-load test shall be conducted on automatic indicating scales and, except for Class III L scales, with test loads equal to the maximum test load at which the smallest tolerance value would apply; for example on a Class III scale at test loads equal to 4000d, 2000d, and 500d (for scales with less than 1000d, a test load equal to one-half capacity). On a Class III L scale the test load shall be equal to one-half of the maximum applied test load. The test load shall be distributed approximately evenly on the load receiving element of the scale.

N.1.2.1. ZERO BALANCE SHIFT.- A balance shift test shall be conducted on all scales after the removal of any test load. The balance should not change more than the minimum tolerance applicable. (See also G-UR.4.2.)

N.1.3. SHIFT TEST.

N.1.3.1. ON BENCH OR COUNTER SCALES.- A shift test shall be conducted with a half-capacity test load centered successively at four points equidistant between the center and the front, left, back, and right edges of the load-receiving element.

N.1.3.2. ON DAIRY-PRODUCT-TEST SCALES.- A shift test shall be conducted with a test load of 18 grams, this load being successively positioned at all points at which a weight might reasonably be placed in the course of normal use of the scale.

N.1.3.3. ON EQUAL-ARM SCALES.- A shift test shall be conducted with a half-capacity test load shifted, as prescribed in N.1.3.1., on each pan, with an equal test load centered on the other pan.

N.1.3.4. ON VEHICLE SCALES.- A shift test shall be conducted with at least two different test loads successively distributed between the two load bearings (or other weighing elements) that support each section of the scale.

N.1.3.5. ON RAILWAY TRACK SCALES WEIGHING INDIVIDUAL CARS IN SINGLE DRAFTS.- A shift test shall be conducted with at least two different test loads, if available, distributed over, or to the right and left of, each pair of main levers or other weighing elements supporting each section of the scale.

N.1.3.6. ON ALL OTHER SCALES EXCEPT CRANE SCALES AND HANGING SCALES.- A shift test shall be conducted on all other scales, except crane scales and hanging scales, with a half-capacity test load centered, as nearly as possible, successively at the center of each quarter of the load-receiving element, or with a quarter-capacity test load centered, as nearly as possible, successively over each main load support.

N.1.4. SENSITIVITY TEST.- A sensitivity test shall be conducted on non-automatic indicating (weighbeam) scales only, with the weighing device in equilibrium at zero-load and at maximum test load.

N.1.5. DISCRIMINATION TEST.- A discrimination test shall 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.

N.1.5.1. ON A DIGITAL DEVICE.- On a digital device, this test is conducted from the lower or upper edge of the zone of uncertainty for increasing and decreasing load tests, respectively.

N.1.6. RATIO TEST.- A ratio test shall be conducted on all scales employing counterpoise weights and on nonautomatic-indicating equal-arm scales.

N.2. VERIFICATION (TESTING) STANDARDS.- Standard weights and masses used in verifying weighing devices shall comply with requirements of NBS Handbook 105-1 (Class F) or the tolerances expressed in Fundamental Considerations, paragraph 3.2. (i.e., 25% of the smallest tolerance applied)

N.3. MINIMUM TEST-LOAD* FOR IN-SERVICE TESTS.

N.3.1. ON DEVICES OF 100 POUNDS CAPACITY OR LESS.- The minimum test weight load for devices of 100 pounds capacity or less, shall be 106% of device capacity.

N.3.2. ON DEVICES OF MORE THAN 100 POUNDS CAPACITY UP TO AND INCLUDING 2 000 POUNDS.- The minimum test-load for devices of more than 100 pound capacity up to and including 2 000 pounds shall be not less than 50% of device capacity.

N.3.3. ON DEVICE OF MORE THAN 2 000 POUNDS CAPACITY.- The minimum test-load for devices of more than 2 000 pounds capacity shall be not less than 25% of device capacity and where practicable, shall be equal to the used capacity of the device.

N.3.4. ON RAILWAY TRACK SCALES.- The minimum test-load for railway track scales on a static test shall not be less than 30 000 pounds, and for coupled in motion tests a test train of 10 cars or more, yielding at least 100 car weights.

*The term test-load provides for the test of devices using test-weights less than the values specified for test loads, but requires substitution or build-up tests up to the values specified.

N.4. NOMINAL CAPACITY OF PRESCRIPTION SCALES.- In the absence of information to the contrary the nominal capacity of a prescription scale shall be assumed to be 1/2 apothecaries ounce.

T. TOLERANCES MAXIMUM PERMISSIBLE ERRORS (MPE)

T.1. PRINCIPLES.

T.1.1. The tolerance for a weighing device is a performance requirement independent of the design principle used.

T.1.2. Weighing devices are divided into accuracy classes according to the number of scale divisions (n) and the value of the scale division (d).

T.1.3. The tolerance for a weighing device is related to the value of the scale division (d) or the value of the verification scale division (e) and is expressed in terms of a scale division (d or e).

T.2. TOLERANCE APPLICATION.

T.2.1. GENERAL.- The tolerance values are positive (+) and negative (-), with the weighing device adjusted to zero at no load. When tare is in use, the tolerance values are applied from the tare zero reference.

T.2.2. FOR TYPE EVALUATION EXAMINATIONS.- For type evaluation examinations the tolerance values apply to increasing and decreasing load tests within the temperature, humidity, power supply, and barometric pressure limits as specified in T.8.

T.2.3. FOR SUBSEQUENT VERIFICATION EXAMINATIONS.- For subsequent verification examinations the tolerance values apply to all tests with the influence factors as specified in T.8. in effect at the time of the conduct of the examinations.

T.2.4. FOR MULTI-RANGE (VARIABLE SCALE DIVISION) DEVICES.- For multi-range devices, the tolerance values are based on the value of the scale division of the range in use.

T.2.5. FOR RATIO TESTS.- For ratio tests, the tolerance values are 0.75 of values specified in table 4.

T.3. TOLERANCE VALUES.

T.3.1. The maintenance tolerance values are as specified in table 4.

T.3.2. The acceptance tolerance values for all weighing devices shall be one-half the maintenance tolerance values.

T.3.3. SEPARATE MAIN ELEMENTS: LOAD TRANSMITTING ELEMENT, INDICATING ELEMENT, ETC.- If a main element, separate from a weighing device, is submitted for type evaluation, the tolerance for the element is no more than 0.7 times that for the complete weighing device. This fraction includes the tolerance attributable to the testing devices used.

TABLE 4.- MAINTENANCE TOLERANCES

Class \ d or e	1	2	3	5
Class	Number of scale divisions (n)			
I	0 - 50 000	50 001 - 200 000	200 001 +	
II	0 - 5 000	5 001 - 20 000	20 001 +	
III	0 - 500	501 - 2 000	2 001 - 4 000	4 000 +
III L	0 - 500	501 - 1 000	(Add 2d for each additional 1000d or fraction thereof)	
IIII	0 - 50	51 - 200	201 - 400	400 +

T.3.4. IN-MOTION WEIGHING.- Tolerances for in-motion weighing of a group of weighments appropriate to the application must satisfy the following conditions:

T.3.4.1. For any group of weighments, the error in the total of the individual weights of the group must be within the total of the maintenance static tolerances appropriate to the weights of the group; and

T.3.4.2. For any single weighment within a group, the weighment error shall not exceed:

Percentage of Group	Maintenance Static Tolerance Multiplier
65%	1.0
30%	2.0
5%	3.0

T.3.4.3. For any group of weighments wherein the sole purpose is to determine the total of the group of weighments, T.3.4.1. alone applies.

T.3.4.4. For any single weighment within a group of non-interactive (i.e., uncoupled), loads, the weighment error shall not exceed the maintenance static tolerance.

T.4. AGREEMENT OF INDICATIONS.

T.4.1. MULTIPLE INDICATING/RECORDING ELEMENTS, MULTIPLE BALANCING METHOD.- In the case of multi-indicating/recording elements, including tare or multiple beams, tolerances shall be applied independently to each separate indicating and recording element of a weighing device.

T.4.2. SINGLE INDICATING/RECORDING ELEMENT, MULTIPLE BALANCING METHOD.- For a single indicator, the indications shall agree within one half division when the method of balancing is changed (e.g., counter-poise weights applied to the tip of a weighbeam, unit weights with a dial, etc.)

T.4.3. MULTIPLE INDICATING/RECORDING ELEMENT, SINGLE BALANCING METHOD.- For a weighing device equipped with multiple elements, used for indicating and/or recording, and a single means for balancing: For the same load, indications or recorded values, when taken in pairs, shall agree within one-half the value of the scale division in use.

T.4.4. TIME DEPENDENCE.- At constant test conditions the indication 20 seconds after the application of a load, and the indication after one hour shall not differ by more than the absolute value of the applicable tolerance for the applied load.

T.5. REPEATABILITY.

T.5.1. The results obtained under reasonably constant static test conditions, by several weighings of the same load, shall agree within the absolute value of the maintenance tolerance for that load.

T.5.2. Any two results obtained under reasonably constant static test conditions, during the shift test, or section test, shall agree within the absolute value of the maintenance tolerance for that load.

T.6. SENSITIVITY.

T.6.1. A test load, equivalent to 1d at zero and 2d at maximum test load shall cause a permanent change of at least:

- (a) On a scale with trig loop but without a balance indicator, the position of the weighbeam shall change from the center to the outer limit of the trig loop.
- (b) On a scale with balance indicator, the position of the indicator shall change at least one division on the graduated scale, the width of the central target area, or the following value, whichever is greater.

0.04 inch [1 mm] for scales of Class I and II.

0.08 inch [2 mm] for scales of Classes III and IIII with a maximum capacity of 70 lb [30 kg] or less.

0.20 inch [5 mm] for scales of Classes III, III L, and IIII with a maximum capacity of more than 70 lb [30 kg].

- (c) On a scale without a trig loop or balance indicator, the position of rest of the weighbeam or lever system shall change from the horizontal or midway between limiting stops to either limit of motion.

T.7. DISCRIMINATION.

T.7.1. AUTOMATIC INDICATING - ANALOG (I.E., WEIGHING DEVICE WITH DIAL, DRUM, FAN, ETC.).- A test load of 1d shall cause a change in the indication of at least 0.7d.

T.7.2. AUTOMATIC INDICATING - DIGITAL.- A test load equivalent to 1.4 times the minimum division shall cause a change of the indicated or recorded value of two divisions. This requires that the zone of uncertainty shall not be greater than 0.3 times the value of minimum division.

T.8. INFLUENCE QUANTITIES.- Applicable to type evaluation examinations only and non-retroactive for prescription, jewelers, or dairy-product test scales.

T.8.1. TEMPERATURE.- Devices shall satisfy the tolerance requirements under the following temperature conditions:

T.8.1.1. If not specified in the operating instructions for the device, the temperature limits shall be:

-10 °C (14 °F) to +40 °C (104 °F)

T.8.1.2. If temperature limits are specified for the device, the range shall be at least:

<u>Class</u>	<u>Temperature</u>
I	5 °C (9 °F)
II	15 °C (27 °F)
III, III L & IIII	30 °C (54 °F)

For class III, III L and Class IIII devices, unless the temperature range is -10 to +40 °C, the temperature range shall be marked on the identification plate.

T.8.1.3. TEMPERATURE EFFECT ON ZERO-LOAD BALANCE.- The zero-load indication shall not vary by more than 1 division per 5 °C change in temperature.

T.8.1.4. OPERATING TEMPERATURE.- Except for Class I and II devices, an indicating or recording element shall not display or record any usable values until the operating temperature necessary for accurate weighing and a stable zero balance condition has been attained.

T.8.2. HUMIDITY.- If a particular humidity limit is not specified in the operating instructions, the weighing device must satisfy the conditions defined in paragraphs T.3. through T.7. inclusive within 10 to 95% relative humidity, non-condensing, except for Class I devices for which the limits shall be 40 to 80% relative humidity.

T.8.3. ELECTRIC POWER SUPPLY.

T.8.3.1. POWER SUPPLY, VOLTAGE AND FREQUENCY.

- (a) Weighing devices that operate using alternating current must perform within the conditions defined in paragraphs T.3. through T.7. inclusive over the line voltage range of 100-130 volts rms and over the frequency range of 59.5 to 60.5 Hz.
- (b) Battery operated instruments shall not indicate or record values in excess of the applicable tolerance values caused by excessive or deficient battery power output.

T.8.3.2. POWER INTERRUPTION.- An indicating or recording element shall not display or record any out-of-tolerance values caused by power interruptions.

T.8.4. BAROMETRIC PRESSURE.- The zero indication must not vary by more than one scale division for a change in barometric pressure of 1 kilopascal over the total barometric pressure range of 112 to 124 kilopascals (28 to 31 inches of Hg).

UR. USER REQUIREMENTS

UR.1. SELECTION REQUIREMENTS.- Equipment shall be suitable for the service in which it is used with respect to elements of its design, including but not limited to, its capacity, number of scale divisions, value of the scale division, minimum capacity, and computing capability.

UR.1.1. GENERAL.- The minimum class of device for use in particular weighing applications shall be as shown in Table 5.

TABLE 5.- Class of Weighing Devices for Particular Applications

Class	Weighing Application
I	Precision Laboratory Weighing
II	Precision Laboratory Weighing Precious Metals and Gem Weighing
III	All Commercial Weighing not otherwise specified
III L	Vehicle Weighing Axle Load Weighing Livestock Weighing Railway Weighing
IIII	Wheel Load Weighing Service Weighing (non-custody transfer)

UR.1.2. GRAIN HOPPER SCALES.- The minimum number of divisions for a Class III Hopper Scale used for weighing grain shall be 2 000.

UR.2. INSTALLATION REQUIREMENTS.

UR.2.1. SUPPORTS.- A scale that is portable and that is being used on a counter or table or on the floor shall be so positioned that it is firmly and securely supported.

UR.2.2. SUSPENSION OF HANGING SCALE.- A hanging scale shall be freely suspended from a fixed support when in use.

UR.2.3. PROTECTION FROM ENVIRONMENTAL FACTORS.- The indicating elements, the lever system or load cells, and the load receiving element of a permanently installed scale, and the indicating elements of a scale not intended to be permanently installed, shall be adequately protected from environmental factors such as wind, weather, and RFI which may adversely affect the operation or performance of the device.

UR.2.4. FOUNDATION, SUPPORTS, AND CLEARANCE.- The foundation and supports of any scale installed in a fixed location shall be such as to provide strength, rigidity, and permanence of all components, and clearance shall be provided around all live parts to the extent that no contacts may result when the load-receiving element is empty and throughout the weighing range of the scale. *On motor truck and livestock scales the clearance between the load receiving elements and the coping at the bottom edge of the platform shall be greater than at the top edge of the platform. (Nonretroactive as of 1973)*

UR.2.5. ACCESS TO PIT.- Adequate provision shall be made for ready access to the pit of a permanently installed vehicle, livestock, or animal scale for purposes of inspection and maintenance.

UR.2.6. APPROACHES.

UR.2.6.1. TO VEHICLE SCALES.- On the approach end or ends of a vehicle scale installed in any one location for a period of six months or more, there shall be a straight approach as follows:

- (a) the width at least the width of the platform, and*
- (b) the length at least one-half the length of the platform but not required to be more than 40 feet, and*
- (c) not less than 10 feet of any approach adjacent to the platform shall be constructed of concrete or similar durable material to insure that this portion remains smooth and level and in the same plane as the platform. However, grating of sufficient strength to withstand all loads may be installed in this portion; and further, where deemed necessary for drainage purposes, the remaining portion of the approach may slope slightly. (Nonretroactive as of 1976)*

UR.2.6.2. TO AXLE LOAD SCALES.- At each end of an axle load scale there shall be a straight paved approach in the same plane as the platform. The approaches shall be the same width as the platform and of sufficient length to insure the level positioning of vehicles during weight determinations.

UR.2.7. STOCK RACKS.- A livestock or animal scale shall be equipped with a suitable stock rack, with gates as required, which shall be securely mounted on the scale platform. Adequate clearances shall be maintained around the outside of the rack.

UR.2.8. HOISTS.- On motor vehicle scales equipped with means for raising the load receiving element from the weighing element for vehicle unloading, suitable means shall be provided so that it is readily apparent to the weigher when the load receiving element is in its designed weighing position.

UR.3. USE REQUIREMENTS.

UR.3.1. MINIMUM LOAD.- A minimum load is specified in Table 6 to indicate that the use of a device to weigh light loads is likely to result in large relative errors.

UR.3.2. MAXIMUM LOAD.- A scale shall not be used to weigh a load more than the nominal capacity of the scale.

TABLE 6.- MINIMUM LOAD

<u>Class</u>	<u>Value of the Scale Division (d or e*)</u>	<u>Minimum Load (Min) (d or e*)</u>
I	$d(e) \geq 0.001 \text{ g}$	100
II	$0.001 \text{ g} \leq d(e) \leq 0.05 \text{ g}$ $d(e) \geq 0.1 \text{ g}$	20 50
III & IIIL	All	20
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.

UR.3.3. SINGLE-DRAFT VEHICLE WEIGHING.- A vehicle or a coupled vehicle combination shall be commercially weighed on a vehicle scale only as a single draft. That is, the total weight of such a vehicle or combination shall not be determined by added together the results obtained by separately and not simultaneously weighing each end of such vehicle or individual elements of such coupled combination. However,

- (a) the weight of a coupled combination may be determined by uncoupling the various elements (tractor, semitrailer, trailer), weighing each unit separately as a single draft, and adding together the results, and
- (b) the weight of a vehicle or coupled-vehicle combination may be determined by adding together the weights obtained while all individual elements are resting simultaneously on more than one scale platform.

UR.3.4. WHEEL-LOAD WEIGHING.

UR.3.4.1. USE IN PAIRS.- When wheel-load weighers are to be regularly used in pairs, both weighers of each such pair shall be appropriately marked to identify them as weighers intended to be used in combination.

UR.3.4.2. LEVEL CONDITION.- A vehicle for which either an axle-load determination or a gross-load determination is being made utilizing wheel-load weighers, shall be in a reasonably level position at the time of such determination.

UR.3.5. SPECIAL DESIGNS.- A scale designed and marked for a special application (such as a prepackaging scale) shall not be used for other than its intended purpose.

UR.3.6. WET COMMODITIES.- Wet fish and other wet commodities shall be weighed only on scales on which the pans or platforms will drain properly.

UR.4. MAINTENANCE REQUIREMENTS.

UR.4.1. BALANCE CONDITION.- The zero-load adjustment of a scale shall be maintained so that, with no load on the load-receiving element and with all load-counterbalancing elements of the scale such as poises, drop weights, or counterbalance weights set to zero, the scale shall indicate or record a zero balance condition. A scale not equipped to indicate or record a zero-load balance shall be maintained in balance under any no-load condition.

UR.4.2. LEVEL CONDITION.- If a scale is equipped with a level-indicating means, the scale shall be maintained in level.

UR.4.3. SCALE MODIFICATION.- Neither the length nor the width of the load-receiving element of a scale shall be increased beyond the manufacturer's design dimension, nor shall the capacity of a scale be increased beyond its design capacity by replacing or modifying the original primary indicating or recording element with one of a higher capacity, except when the modification has been approved by competent engineering authority, preferably that of the engineering department of the manufacturer of the scale, and by the weights and measures authority having jurisdiction over the scale.

Footnote: Prepackaging scales (and other commercial devices) used for putting up packages in advance of sale are acceptable for use in commerce if all appropriate provisions of Handbook 44 are met. Users of such devices must be alert to the legal requirements relating to the declaration of quantity on a package. Such requirements are to the effect that, on the average, the contents of the individual packages of a particular commodity comprising a lot, shipment, or delivery must contain at least the quantity declared on the label. The fact that a prepackaging scale may overregister, but within established tolerances, and is approved for commercial service is not a legal justification for packages to contain, on the average, less than the labeled quantity.

301-2 PRECISION BALANCES

In last year's report, the Committee indicated that the existing requirements in the Scale Code did not adequately cover balances. It recommended that when these balances are being officially examined, due regard should be given to the appropriateness of each code requirement when applied to balances with special consideration for the use of the equipment; for example, in laboratories when used by skilled technicians or when used in the marketplace by precious metals and jewelry dealers. The Committee also stated that when the new Scale Code is adopted most problems will be resolved.

The Committee reconfirms that position.

(Item 301-2 was adopted)

301-3 AUTOMATIC GRAIN BULK WEIGHING SYSTEMS

In last year's Report to the Conference there was an item titled "Scales Used for Weighing Grain." In this item a letter from the Federal Grain Inspection Service (FGIS) was included in which they offered their whole-hearted cooperation and requested the Committee to consider the development of a separate code for automatic grain bulk weighing systems. The letter further stated that it was their ultimate goal to eliminate FGIS regulations applicable to scales used for weighing grain. In this spirit of cooperation, the Committee's technical advisor, in consultation with a staff member of FGIS did develop a draft code for automatic grain bulk weighing systems. During the interim meeting the Committee reviewed this draft code, decided that it had considerable merit, and that it could be applicable to not only grain but all automatic bulk weighing systems. However, it is the view of the Committee that additional changes would be necessary if it were to be applied to other automatic bulk weighing applications, and is not prepared to make those changes at this time. The Committee then referred this draft code to the National Type Evaluation Technical Committee (NTETC), requesting their review and comment. During its meeting held February 8 and 9, 1983, the Technical Committee did review this material and the draft code that follows is the result. The Committee recommends the adoption of this code and further recommends that if the Conference acts affirmatively the new scale code and format be amended if necessary to embody the principles and requirements of this draft code into it.

AUTOMATIC BULK WEIGHING SYSTEMS FOR GRAIN

A. APPLICATION

A-1. GENERAL.- This code applies to automatic bulk weighing systems for grain; that is, a weighing system adapted to the automatic weighing of grain in successive drafts of predetermined amounts automatically recording the no-load and loaded weight values and accumulating the net weight of each draft.

A-2. See also General Code Requirements.

S. SPECIFICATIONS

S.1. DESIGN OF INDICATING AND RECORDING ELEMENTS AND RECORDED REPRESENTATIONS.

S.1.1. ZERO INDICATION.- Provisions shall be made to indicate and record a no-load reference value and if the no-load reference value is a zero value indication, to indicate and record an out-of-balance condition on both sides of zero.

S.1.1.1. DIGITAL ZERO INDICATION.- A digital zero indication shall represent a balance condition that is within plus or minus $1/2$ the value of the scale division.

S.1.2. VALUE OF SCALE DIVISION (d).- The value of the scale division (d) expressed in a unit of weight shall be equal to:

- (a) 1, 2, or 5, or
- (b) a decimal multiple or submultiple of 1, 2, or 5, or
- (c) a binary submultiple of a unit of weight.

Examples: Scale divisions may be .01, .02, or .05; .1, .2, or .5; 1, 2, or 5; 10, 20, or 50; or $1/2$, $1/4$, $1/8$, $1/16$, etc.

S.1.3. CAPACITY INDICATION AND RECORDED REPRESENTATION.- An indicating or recording element shall not indicate or record any values when the gross load is in excess of 105% of the capacity of the system.

S.1.4. WEIGHING SEQUENCE.- For systems used to receive (weigh in) the no-load reference value shall be determined and recorded only at the beginning of each weighing cycle. For systems used to deliver (weigh out), the no-load reference value shall be determined and recorded only after the gross load reference value for each weighing cycle has been indicated and recorded.

S.1.5. RECORDING SEQUENCE.- Provision shall be made so that all weight values are indicated until the completion of the recording of the indicated value.

S.1.6. PROVISION FOR SEALING ADJUSTABLE COMPONENTS ON ELECTRONIC DEVICES.- Provision shall be made for applying a security seal in a manner that requires the security seal to be broken before an adjustment can be made to any component affecting the performance of the device.

S.2. DESIGN OF BALANCE AND DAMPING MECHANISM.

S.2.1. ZERO-LOAD ADJUSTMENT.- The weighing system shall be equipped with manual or semiautomatic means by which the zero-load balance or no-load reference value indication may be adjusted. An automatic zero setting mechanism is prohibited.

S.2.1.1. MANUAL.- A manual zero-load or no-load reference value setting mechanism shall be operable or accessible only by a tool outside of or entirely separate from this mechanism or enclosed in a cabinet.

S.2.1.2. SEMIAUTOMATIC.- A semiautomatic zero-load or no load reference value setting mechanism shall meet the provisions of S.2.1.1. or shall be operable only when:

- (a) the indication is stable within plus or minus 3 scale divisions, and
- (b) cannot be operated during a weighing operation.

S.2.2. DAMPING MEANS.- A system shall be equipped with effective means necessary to bring the indications quickly to a readable, stable equilibrium. Effective means shall also be provided to permit the recording of weight values only when the indication is stable within plus or minus 3 scale divisions for devices with 10 000 scale divisions, or plus minus 1 division for devices with less than 10 000 scale divisions.

S.3. INTERLOCKS AND GATE CONTROL.

S.3.1. GATE POSITION.- Provision shall be made to clearly indicate to the operator the position of the gates leading directly to and from the weigh hopper.

S.3.2. INTERLOCKS.- Each automatic bulk weighing system shall have operating interlocks to provide for the following:

- (a) Product cannot be cycled and weighed if the weight recording element is disconnected or subjected to a power loss.
- (b) The recording element cannot print a weight if either of the gates leading directly to or from the weigh hopper is open.
- (c) A "low paper" sensor, when provided, is activated.
- (d) The system will operate only in the proper sequence in all modes of operation.

S.4. DESIGN OF WEIGHING ELEMENTS.

S.4.1. ANTIFRICTION MEANS.- At all points at which a live part of the mechanism may come into contact with another part in the course of normal usage, frictional effects shall be reduced to a minimum by means of suitable antifriction means, opposing surfaces, and points being properly shaped, finished, and hardened.

S.4.2. ADJUSTABLE COMPONENTS.- An adjustable component, such as a potentiometer, shall be held securely in adjustment and, except for a component for adjusting level or a no-load reference value shall not be adjustable from the outside of the device.

S.4.3. MULTIPLE LOAD-RECEIVING ELEMENTS.- A system with a single indicating or recording element, or a combination indicating-recording element, that is coupled to two or more load-receiving elements with independent weighing systems, shall be provided with means to prohibit the activation of any load-receiving element (or elements) not in use, and shall be provided with automatic means to indicate clearly and definitely which load-receiving element (or elements) is in use.

S.4.4. VENTING.- All weighing systems shall be vented so that any internal or external pressure will not affect the accuracy or operation of the system.

S.5. MARKING REQUIREMENTS. (See also G-S.1.)

S.5.1. CAPACITY AND VALUE OF THE SCALE DIVISION.- The capacity of the weighing system and the value of the scale division shall be clearly and conspicuously marked on the indicating element near the weight value indications.

S.5.2. WEIGHING ELEMENTS.- On a weighing element not permanently attached to an indicating element, there shall be clearly and permanently marked for the purposes of identification the name, initials, or trademark of the manufacturer, the manufacturer's designation that positively identifies the pattern or design, and the nominal capacity.

N. NOTES

N.1. TESTING PROCEDURES.

N.1.1. INCREASING LOAD TEST.- *An increasing load test shall be conducted with test weights equal to 10% of the capacity of the system. (Non-retroactive as of January 1, 1984.)* A buildup test using bulk material shall be conducted in increments equal to the total value of the official test weights; the test shall be conducted to the used capacity of the weighing system.

N.1.2. ZERO BALANCE OR NO-LOAD REFERENCE VALUE CHANGE.- A zero-balance or no-load reference value change test shall be conducted on all scales after the removal of any test load. The balance should not change more than the minimum tolerance applicable.

N.1.3. ZONE OF UNCERTAINTY TEST.- A zone of uncertainty test shall be conducted under controlled conditions in which environmental factors are reduced to the extent that they will not affect the results obtained.

N.2. VERIFICATION (TESTING) STANDARDS.- Standard weights and masses used in verifying weighing devices shall comply with requirements of NBS Handbook 105-1 (Class F) or the tolerances expressed in Fundamental Considerations, paragraph 3.2. (i.e., 25% of the smallest tolerance applied).

T. TOLERANCES

T.1. TOLERANCE APPLICATION.- Tolerance values shall be applied to all indications and recorded representations of a weighing system.

T.1.1. TO ERRORS OF UNDERREGISTRATION AND OVERREGISTRATION.- The tolerances hereinafter prescribed shall be applied equally to errors of underregistration and errors of overregistration.

T.1.2. TO INCREASING LOAD TESTS.- Basic tolerances shall be applied.

T.2. MINIMUM TOLERANCE VALUES.- The minimum tolerance value shall not be less than half the value of the scale division.

T.3. BASIC TOLERANCE VALUES.- The basic maintenance tolerance shall be one pound per 1000 pounds of test load (0.1 percent). The basic acceptance tolerance shall be one-half the basic maintenance tolerance.

UR. USER REQUIREMENTS

UR.1. *SELECTION REQUIREMENTS.- The number of scale divisions of a weighing system shall not be less than 4 000 or greater than 10 000 for a system with a capacity greater than 10 000 pounds, and not less than 2 000 or greater than 10 000 for a system with a capacity equal to or less than 10 000 pounds. (Non-retroactive and enforceable as of January 1, 1984.)*

Examples:

<u>System Capacity</u>	<u>Value of Scale Division</u>	<u>No. of Scale Divisions</u>	<u>Maximum No. of Scale Divisions</u>
20 000	5(2)	4 000	10 000
40 000	10(5)	4 000	8 000
60 000	10	6 000	
100 000	20(10)	5 000	10 000
120 000	20	6 000	
200 000	50(20)	4 000	10 000

UR.2. INSTALLATION REQUIREMENTS.

UR.2.1. PROTECTION FROM ENVIRONMENTAL FACTORS.- The indicating elements, the lever system or load cells, the load-receiving element, and any permanently installed test weights shall be adequately protected from environmental factors such as wind, weather, and RFI which may adversely affect the operation or performance of the device.

UR.2.2. FOUNDATION, SUPPORTS, AND CLEARANCE.- The foundation and supports of any system shall be such as to provide strength, rigidity, and permanence of all components, and clearance shall be provided around all live parts to the extent that no contacts may result when the load-receiving element is empty and throughout the weighing range of the scale.

UR.3. LOADING REQUIREMENTS.- A system shall not be used to weigh drafts less than 40% of the weighing capacity of the system except for a final partial draft. Loads shall not normally be retained on the weighing element for a period longer than a normal weighing cycle.

UR.4. SYSTEM MODIFICATION.- The weighing system shall not be modified except when the modification has been approved by a competent engineering authority preferably that of the engineering department of the manufacturer of the scale, and the authority having jurisdiction over the scale.

Amend Scale Code paragraph A.1. GENERAL, by adding in the second line after the words belt conveyor scales the words "and automatic bulk weighing systems for grain."

(A motion was made to amend this item by including in N.1.1. a requirement that the amount of test weights be 1 000 times the value of the scale division. The Chair recognized a majority vote to debate. The motion to amend was defeated. Item 301-3 was adopted.)

301-4 UR.1.1.4. VALUE OF THE SCALE DIVISION/FOR GRAIN HOPPER SCALES ONLY

The Committee received comments from a Regional Association, that this requirement was not adequate to cover small capacity grain hopper scales. For example, a 2 000-pound capacity hopper scale would only be required to have a 10-pound division. The recommendation of this Regional Association to resolve the problem is to require these devices to have a minimum number of scale divisions, and specifically 2 000. Thus a 2 000-pound capacity hopper scale would be required to have a 1-pound scale division, a 1 000-pound capacity, a 0.5-pound scale division, a 10 000-pound capacity a 5-pound division.

The Committee agrees with this suggestion and recommends that this requirement be amended by adding the following non-retroactive sentence at the end of the paragraph.

In any case, the value of the scale division shall not be greater than 0.05% (1/2 000) of scale capacity.

(Item 301-4 was adopted)

301-5 S.1.1. ZERO INDICATION-POSITIVE VALUE/NO-LOAD REFERENCE

At the conclusion of the Committee's report to last years Conference, a group of Conference attendees requested a brief meeting with the Committee to discuss what they considered to be a problem in interpreting this paragraph for a certain weighing application. The Committee agreed that a problem did exist, and as a result, the Committee developed an interpretation which was circulated to all State officers in a memo dated October 25, 1982. The information and interpretation contained in that memo is as follows:

"The National Conference on Weights and Measures Specifications and Tolerances Committee has been requested to express their opinion with respect to the use of a positive value no-load reference for devices other than automatic bulk weighing systems.

The Committee dealt with this issue for automatic bulk weighing systems and presented their view in their report to the 66th NCWM in 1981. That information can be found in Item 303-7, pages 152-154 (a copy is enclosed for your convenience).

The specific application for which the Committee has been requested to provide an opinion is a receiving hopper scale, manually operated, single draft, installed below grade, and used to receive grain in a direct sale at grain elevators. This type of device replaces a vehicle scale with a dump.

It is the view of the Committee that a positive value no-load reference can be used if the principles expressed in the aforementioned criteria applicable to automatic bulk weighing systems are met; e.g.,

1. If the device is used to receive grain, the no-load reference value is displayed and recorded first.
2. All values are recorded; i.e., (a) no load, (b) full load, and (c) net load, and are included with the information provided to the seller.
3. An effective motion detection system is provided consistent with the requirements of NBS Handbook 44 with respect to a semi-automatic (push button) zero and the recording element.
4. The values are displayed during the printing cycle.
5. Some guarantee and indication that the discharge gates on the weigh hopper and garner are closed during the weighing and printing cycle, and that both cannot be open at the same time.
6. The method used to transport the grain from the weigh hopper cannot be operated during the weighing cycle.

7. The system shuts down automatically when it fails to operate in accordance with its design."

After this memo was circulated, one State responded that if this requirement was in need of such an interpretation it should be reviewed and amended.

To clarify this situation the Committee recommends code amendment as follows:

Add a new paragraph S.1.1.1. to read:

S.1.1.1. NO LOAD REFERENCE VALUE.- On a single-draft manually-operated receiving hopper scale installed below grade, used to receive grain, and utilizing a no-load reference value, provision shall be made to indicate and record the no-load reference value prior to the gross load value.

(Item 301-5 was adopted)

*301-6 DYNAMIC WEIGHING OF MOTOR TRUCKS FOR ENFORCEMENT PURPOSES

This subject has appeared in the Committee reports of the last two years as informational items, requesting any data available. The Federal Highway Administration has also requested that the Committee seriously consider recommending code amendment in recognition of these devices. The only information available to the Committee at the present time is that these devices have been used with varying degrees of success as screening devices; that is, they have been installed along highways for screening out trucks that are obviously light enough to proceed without going to the scales used for official weight determination.

It is the view of the Committee that if these devices can perform within the same accuracy limits as wheel-load weighers ($\pm 2\%$), they would be equally as appropriate for use. If it is necessary to restrict speeds to less than 5 mph to attain this accuracy, certain restrictions such as the impossibility of indicating any values when the vehicle speed will present weight values in excess of $\pm 2\%$, must be included. If approaches can also cause inaccuracies, then specific criteria for approaches must also be developed.

Although the Committee is receptive to the suggestion to recognize this equipment by code amendment, it is not aware of any data developed in the U.S. that indicate that this equipment can perform within the previously mentioned criteria. Thus it does not recommend code amendment until sufficient data are available. The Committee requests that any data be forwarded to the Committee for its consideration at the next interim meeting.

301-7 UR.3.5. SINGLE-DRAFT VEHICLE WEIGHING

It was brought to the attention of the Committee during its interim meeting by a representative of the Federal Highway Administration that this paragraph caused problems for officials in enforcing gross load overweights using wheel load weighers. Paragraph UR.3.6. does provide for gross weight determinations using wheel-load weighers; however truckers are successfully defending themselves by referencing UR.3.5. which prohibits two-draft weighing for "commercial purposes."

To resolve this issue and clearly indicate to the courts that wheel-load weighers and axle load scales may be used for determining gross loads for enforcement purposes only, the Committee recommends that paragraph UR.3.5. be amended by adding the following sentence to the end of this requirement;

This requirement is not applicable when obtaining gross load weights for highway weight limit enforcement purposes.

(Item 301-7 was defeated)

301-8 MENU SERVICE SCALES

This subject was included in last year's report of the Committee and was defeated by a narrow margin. Two regional associations addressed this issue at their meetings following last years Conference and recommended this subject be brought to the floor once again supporting adoption of the item as previously presented. The rationale of the Committee for the recognition of these devices and adoption of appropriate design and operational characteristics is as follows:

(a) The scale is for use in restaurants and cafeterias to weigh prepared food for consumption by customers. It allows a customer to select from bulk any amount of food to suit his own appetite. Examples of particular foods are salads, french fries, onion rings, and sandwich makings such as sliced meats, cheeses, lettuce, and tomato. Since the design is not considered appropriate for supermarket use, it is required to be conspicuously marked "For Menu Service Only."

(b) Since almost all sales are in amounts less than one pound, it is considered appropriate to have scale divisions in units of ounces rather than pounds. Thus, unit prices are expressed in terms of price per ounce.

(c) The appropriate value for the scale division is 0.05 ounce for several reasons. An equivalent value expressed in pounds is 0.003125. Since that value (0.003125) is impossible to utilize as a real scale division, other designs would present scale divisions of 0.005 pound or 0.01 pound. In these instances the precision is decreased by a factor of 2 or 3, resulting in a greater uncertainty and less equity for each sale. For example, at a unit price of 20¢ per ounce, the uncertainty with 0.05-ounce divisions is + 0.5 cent, with 0.005-pound divisions it is 0.8 cent, and with 0.01 pound divisions it is 1.6 cents.

(d) Because the error that can result in random weighing can be large due to the scale division value, the device should not be used to weigh loads less than 20d (1 ounce), and the scale should be so marked. Applying this same principle to devices equipped with 0.005-pound divisions the minimum load would be increased to 0.1 pound (1.6 ounce) and with 0.01-pound divisions the minimum load would be increased to 0.2 pound (3.2 ounces).

(e) Although the scale will seldom if ever be used to weigh amounts greater than one or two pounds, it is considered appropriate to have a scale capacity of 160 ounces (10 pounds). This allows existing weighing elements of that magnitude to be used; a new design is unnecessary thus realizing a more efficient marketing and measurement system.

The Committee reconfirms its position, reminding the Conference that these devices are being used equitably and successfully in several States, and although this merchandising practice is somewhat limited, should most certainly be recognized.

Therefore the Committee recommends code amendment as follows:

Add new User Requirement to read:

UR.1.1.2. FOR MENU SERVICE SCALES.- The value of the scale division shall be not greater than 0.05 ounce.

Amend S.1.6.3. CUSTOMERS INDICATIONS by adding the following to the end of the paragraph.

..., except on menu service scales, which shall compute and display unit prices in terms of a whole ounce.

Add a definition as follows:

menu service scale. a scale designed, marked, and used to weigh one or more elements comprising a meal for consumption on the premises.

(Item 301-8 was defeated)

*301-9 MULTI-RANGE SCALES

The Committee again reviewed the information available on this subject, and then referred its recommendations to the NTETC for its review and comment. The Technical Committee, during its meeting of February 8 and 9, 1983, did review this material and its recommendations, endorsed by the Committee, appear in Item 301-14 of this report.

*301-10 GRAIN TEST SCALES

Once again in the spirit of cooperation toward uniformity and equity, the Committee reviewed the requirements of FGIS applicable to this equipment and developed recommendations for specific code interpretations. These recommendations were also referred to the NTETC for review and comment and the results, endorsed by the Committee, appear in Item 301-14 of this report.

301-11 UR.2.6.1. APPROACHES TO VEHICLE SCALES

This subject appeared in the interim meeting report of the Committee last year. The problem referenced was with subsection (c) of this requirement, that allowed a slope in that portion of the approach beyond the initial 10 feet for drainage purposes. The amount of slope allowable in this part is described as "slightly" and it was recommended that the word slightly be eliminated and the amount of slope be described in more definitive terms; e.g. one-half inch per foot.

After several motions were made from the floor during last years Conference, a motion to table was passed.

Since last years Conference and at its interim meeting the Committee received several comments on this subject. The Committee discussed at length the problems with steep approaches such as the difficulty in removing test weights from the rear of a test truck with the truck sloping toward the front; the possible undue wear of the scale when trucks must pull up an incline to gain access to the platform and that semi-tractors and trailers may "drag." The Committee also discussed the problems for scale purchasers with limited space when new scales of greater length are to be installed.

Therefore, the Committee recommends as a practical solution that paragraph (c) be amended to read.

(c) not less than 10 feet of any approach adjacent to the platform shall be constructed of concrete or similar durable material to insure that this portion remains smooth and level and in the same plane as the platform. However, grating of sufficient strength to withstand all loads equal to the sectional capacity of the scale may be installed in this portion; and further, where deemed necessary for drainage purposes, the remaining portion of the approach may slope

~~slightly.~~ Any slope in the remaining portion of the approach shall insure (1) ease of vehicle access, (2) ease for testing purposes, and (3) drainage away from the scale. (Nonretroactive as of 1976)
Amended 1977 and 1983 .

(Item 301-11 was adopted)

301-12 T.3.8.4. WEIGHING COUPLED IN MOTION USED FOR UNIT TRAIN WEIGHTS

The Committee received a comment from representatives of the Railroads that this paragraph as adopted by the Conference last year should be amended by adding the following sentence.

"Individual car weights shall be recorded for determining overloads."

Their rationale for this requirement is that the recording of individual car weights is essential for detecting overloaded cars. During the discussion on this item at last years Conference, several officials expressed their concern that if individual car weights are recorded, these values could be used in a commercial transaction. This was considered to be clearly inappropriate since there is no limit on the accuracy of these individual car weights.

The Committee is of the view that there is no prohibition on recording individual car weights, and recognizes the problem for weights and measures officials and the Railroad Industry.

To resolve this issue the Committee will confer with all affected parties and make a positive recommendation in its interim meeting report of 1984.

(Item 301-12 was adopted)

*301-13 SELF-OPERATED RECYCLING MATERIALS DEVICES AND SYSTEMS

During the last several years, recycling centers have been established in many locations in the U.S. The various products that can be sold are aluminum cans and other aluminum material, steel cans, glass bottles, and newspapers. The largest volume product is aluminum cans. Many methods are used to determine the quantity of product, including conventional scales, manual counting, and reverse vending machines, which accept cans placed in the machine and weigh or count them and dispense coins and/or coupons.

Since this is a commercial transaction involving a determination of quantity, it is a weights and measures concern. However, many of the devices used, by reason of special design, do not fall clearly within one of the particular equipment classes for which separate codes have been established in NBS H-44. There is no code, for example, for counting machines. It is the view of the Committee that some criteria should be developed to determine the appropriateness of counting machines for this use, as well as other equipment utilizing some form of weighing device.

Thus, the Committee offers the following guidance to the Conference in evaluating this equipment.

The primary consideration is the performance of the device and the test methods used to determine compliance with the performance specified. In the case of these devices, these two factors are so interrelated that they must be considered together. Since in most cases tests with physical artifact standards are either not possible or the results are not indicative of the performance, the best test method is a material test using the product intended to be weighed or counted. Since material tests introduce more uncertainties in the testing process, this must be considered in developing appropriate tolerances.

In H-44 Fundamental Considerations, it is stated that "tolerance values are so fixed that the permissible errors are sufficiently small that there is no serious injury to either the buyer or seller of commodities, yet not so small as to make manufacturing or maintenance costs of equipment disproportionately high." Another way of stating this is simply "economic impact."

Some of the economic factors to be considered are: cost of manufacture and maintenance of the device, cost of the product being measured, volume of individual sales, and the economic value of measurement errors.

In applying these factors to a reverse vending machine, which counts or weighs cans, the following example can be developed:

- a) the average weight of a 12-ounce can is 0.04 pound or 2/3 ounce
- b) there are approximately 24 cans per pound or one case per pound
- c) the average sale according to some market research is four to five pounds
- d) the present market value is 18¢ to 24¢ per pound.

In extending these values to the marketplace, if a family accumulates 2 cases (48 cans) in a week, they will have accumulated 8 cases or approximately 8 pounds in a month. If the market value at the reverse vending machine is 25¢ per pound, the total value of their one month's accumulation is \$2.00. It would seem that an error of 10¢ per month or \$1.20 per year could hardly be considered significant. Converted to relative terms this would be 5%.

From a weights and measures standpoint 5% seems to be a relatively high figure. To aid in evaluating the appropriateness of 5%, other examples must be considered. This same family may well have an average monthly electric bill of \$50.00. Since a kilowatt-hour meter is a + 2% device, the effect on this family of a 2% error is \$1.00 per month or \$12.00 per year. Thus, the economic impact of the 2% device is 10 times that of a 5% device.

Another example is this family's consumption of gasoline to operate their automobiles. If a car is driven 15,000 miles per year, at 20 miles per gallon the consumption is 750 gallons per year or 62.5 gallons per month. If the average cost of gas is \$1.25 per gallon, the monthly cost is \$78.125. Since the tolerance on a gas pump is 0.5% the value of that error is \$0.39. Thus, the economic impact with a device 10 times more accurate, can result in an error almost 4 times as great.

There are many other examples that could be cited that would produce similar results. It is on this basis that the Committee considers that a 5% tolerance on a material test of these devices meets all of the criteria and is appropriate.

A secondary consideration is the design and operating characteristics of the device. Since these devices are a special design and do not fall clearly within a particular equipment class for which there is a separate code, certain code provisions and requirements can be applied only with due regard to their design, intended purpose, and conditions of use. It is the view of the Committee that particular attention should be given to the following requirements of the General Code.

- G.S.1. Identification.
- G.S.6. Marking Operational Controls, Indications, and Features. (Proper and complete operating instructions should be displayed to the customer.)
- G.S.7. Lettering. (All required markings shall be distinct and easily readable and reasonably permanent.)
- G-UR.1.1. Suitability of Equipment. (In determining the appropriateness of the value of the scale division, the ratio of the average draft to the value of the scale division should be at least 75:1 for small drafts of one pound or less and at least 200:1 for larger drafts.)
- G-UR.1.2. Environment.
- G-UR.2.1. Installation.
- G-UR.2.3. Accessibility for Testing Purposes.
- G-UR.3.1. Method of Operation.
- G-UR.3.4. Responsibility - Money Operated Devices (including the posting of the unit price).
- G-UR.4.4. Assistance in Testing Operations (supplying cans for test materials etc.).

These devices are still under study and if anyone has any comments or seeks further advice please contact the National Conference on Weights and Measures, Specifications and Tolerances Committee, c/o Office of Weights and Measures, National Bureau of Standards, Washington, D.C. 20234.

301-14 REPORT OF THE NATIONAL TYPE EVALUATION TECHNICAL COMMITTEE
(NTETC)

This Technical Committee (Scales and Weighing Systems Section) met for a one-half day session during the week of the interim meetings and once again for a two-day session February 8 and 9, 1983. This Technical Committee undertook a tremendous amount of work and the results are voluminous. Since their output contains far too much material to be included in this report, it will be produced as a separate document, and will be circulated prior to the Conference to all the States and other interested organizations.

The Committee greatly appreciates the help of the Technical Committee and views this cooperative effort as vital in attaining the goals of the Conference.

An outline of the subjects covered by the Technical Committee for inclusion in the new Handbook, Type Evaluation Examinations, Criteria, and Test Procedures, is presented below. The Committee recommends adoption by the Conference of the Technical Committee's output in its entirety.

1. Electronic Cash Register Type Evaluation Check List
2. Interpretations applicable to Weigh-In/Weigh-Out Systems
3. Interpretations applicable to systems equipped with multiple weighing elements and a single indicator
4. Interpretations applicable to multi-range scales
5. Interpretations applicable to grain test scales
6. Additional interpretations applicable to electronic digital indicating devices
7. Additional interpretations for
 - (a) Identification plate location
 - (b) Motion indication means
 - (c) Manual weight entries
 - (d) Devices using magnetic-force restoration principle
8. A definition of "type" for the Model Regulation
9. Further refinements of type definition and parameters for models of a type submitted for evaluation

(Item 301-14 was adopted)

*302 SECTION 2.21. BELT-CONVEYOR SCALE CODE

The Committee has identified three existing documents applicable to Belt Conveyor Scales that are National or International in scope and is aware that there are others regional in scope. The three documents are:

- o NBS H-44 - Belt Conveyor Scale Code
- o OIML International Recommendation #50 - Continuous Totalizing Weighing Machines
- o Instrument Society of America (ISA) Draft Recommended Practice - Continuous Belt Weigh Scales

It is the view of the Committee that there is a need to review these documents, to recommend amendment to NBS H-44 where necessary, and to attempt to bring all documents into harmonization as closely as practicable. This is no small task and since the establishment of Technical Committees to deal with special problems has been so successful, the Committee has recommended to the Conference Chairman that such a Technical Committee be appointed. Represented on this Technical Committee should be Weights and Measures Officials, Users and Manufacturers of Belt Conveyors Scales, ISA, and other regional organizations involved in the testing of these devices. The Conference Chairman agrees that this effort should be undertaken and has assured the Committee that an organizational meeting will be scheduled during this years Conference, and that he will appoint the members of this Technical Committee to be chaired by a member of the S&T Committee.

Interested individuals are urged to contact the Conference Chairman, expressing their desire to participate in this effort, and attend this years Conference and organizational meeting.

303

SECTION 3.30 LIQUID-MEASURING DEVICE CODE

303-1 RETAIL MOTOR FUEL DEVICES - DISPENSER/CONSOLE MONEY - VALUE DIVISION AGREEMENT

This subject has been included in the last two reports of the Committee. This item as it appeared in last years report and Conference action is as follows:

Information on this subject appeared in last year's report as Item 304-3. The Committee's view has not changed that provision must be made in such a system to assure that customers pay only in the same money value divisions as appear on the retail dispenser. The Committee recommends that the Code be amended by adding the following new nonretroactive paragraph:

S.1.4.4.3. MONEY-VALUE DIVISIONS AUXILIARY INDICATIONS.- In a system equipped with auxiliary indications, all indicated money-value divisions shall be identical. (Nonretroactive as of January 1, 1984).

This item was adopted by the 67th NCWM (1982).

The Committee received a communication, requesting that this subject be reconsidered.

The Committee recommends that paragraph S.1.4.4.3. be amended by changing the parenthetical clause at the end of the paragraph to read
"(Non-retroactive and enforceable as of January 1, 1985)"

(Item 303-1 was adopted)

- a. With the increase in retail sales of kerosene, there has also been an increase in the demand for measuring devices and for adequate consumer information. Requests have been received by jurisdictions to allow the use of stroke type pumps once used for retail sales of motor oil, anti-freeze and other petroleum products at service stations. The Committee believes that these devices can meet accuracy requirements, and can be acceptable for use providing they meet the requirements of the code, with two amendments.

The recommended code amendments are:

Amend S.1.1.3. VALUE OF THE SMALLEST UNIT by adding the following phrase at the beginning of the paragraph.

Except for manually operated devices equipped with stops or stroke limiting means, ...

Amend S.2.4. STOP MECHANISM to read:

S.2.4. STOP MECHANISM.- If stops or other stroke-limiting elements are subject to direct pressure or impact, the security of their position shall be accomplished by positive, non frictional engagement of parts and they shall be adjustable to provide for deliveries within prescribed tolerances. The delivery for which the device is set at any time shall be conspicuously indicated. If two or more stops or other elements may selectively be brought into operation to permit deliveries of predetermined amounts, the position for the proper setting of each such element shall be accurately defined, and any inadvertent displacement from position shall be obstructed. ~~and the delivery for which the device is set at any time shall be conspicuously indicated.~~

(Item 303-2a was adopted)

- b. Another vital concern to consumers is the proper identification of the product being dispensed. Thus the Committee recommends that paragraph UR.3.2. Unit Price and Product Identity be amended by changing the second sentence to read:

There shall be conspicuously displayed on each face of the device the identity of the product that is being dispensed., in the most descriptive terms commercially practicable.

(Item 303-2b was adopted)

303-3 N.4.2.2. SPECIAL TESTS/FOR RETAIL MOTOR-FUEL DEVICES

The Committee received comment that part (a) of this paragraph should be amended by adding a metric value equivalent to 5 gallons per minute.

Since metric equivalents to inch-pound values are seldom whole numbers, in recommending an amendment to this paragraph the Committee advises the Conference that any value in parenthesis is rounded to the least significant digit (so called soft conversion) and any value in brackets is the value to be used when the unit in brackets is the primary value to be applied (hard conversion).

Thus the Committee recommends amendment to part (a) to read.

(a) 5 gallons 19 liters per minute.

(Item 303-3 was adopted)

*303-4 CASH-CREDIT-DEBIT/DISCOUNT PRICING

The Committee received a suggestion that requirements be added, if necessary, applicable to the technology used for this marketing practice. The suggestion included a comment that any new requirements or interpretations should provide for the following:

1. That a console interfaced with either an analog or digital indicating dispenser may have the capability of recomputing at the console a displayed total price, if the total price to be paid is different from the value displayed on the dispenser.
2. Allow unit price selection at the dispenser.
3. Allow unit price selection at the console.
4. Allow any unit price displayed on the dispenser to remain following a sale.
5. When the sale includes a pre-set amount, either a money value or a quantity value, discount may be offered the consumer in terms of money returned or additional product delivered.

The Committee agrees that these technical capabilities should be recognized with appropriate designs and that code amendment is not necessary, but that this can best be accomplished with a interpretative references in the new Handbook, Type Evaluation Examinations, Criteria, and Test Procedures. Thus the Committee referred this item to the Technical Committee on National Type Evaluation.

*303-5 ARTIFICIAL HEATING OF PETROLEUM PRODUCTS

The Committee has received information that some retailers are artificially heating certain petroleum products, including diesel fuel and fuel oil, prior to measurement to the user. It is the view of the Committee that (1) this practice, providing heating is not necessary to facilitate the measurement process in a firmly established general practice, is fraudulent, (2) that code amendment is not necessary to prevent this activity, and (3) that existing laws and regulations are sufficient to apply the following principle:

"The temperature of all heating fuels and motor fuels during the measurement process shall be that temperature of the product as attained and maintained in a normal storage environment, and shall not be artificially raised or lowered.

*303-6 TEMPERATURE COMPENSATION

A comment was received indicating there was a need for amending the requirements of the Liquid-Measuring Device code that apply to temperature compensators to recognize latest technology and methodology. Specific code paragraphs referenced were S.2.6.4. THERMOMETER WELL WITH AUTOMATIC TEMPERATURE COMPENSATION and UR.3.5.3. NONAUTOMATIC TEMPERATURE COMPENSATION. Other concerns were (a) allowable difference in temperatures taken at the meter and at a location where the temperature may be taken for nonautomatic temperature compensation purposes, (b) the time interval automatic temperature probes should sense and input temperatures into the system, and (c) that generally tolerances applicable to wholesale meters are excessive.

The Committee discussed at length these suggestions and those comments offered on this item during the interim meeting. As a result the Committee does not see the need for code amendment and expresses the following opinions.

In any system that corrects a measured volume to a volume at a specific temperature, it is essential that wherever the temperature is taken, and whatever the means used in determining the net quantity, an accurate quantity representation must result. If a temperature probe is located at some distance from the meter and sends that information to a micro-processor based instrument in which a specific value for the cubical coefficient of thermal expansion of the product being measured is pre-programmed, all of the elements of the system must provide correct results.

A consideration in determining the adequacy of a temperature determination methodology is as follows:

The acceptance tolerance for a wholesale meter on a 500-gallon test draft is 137.5 cubic inches. Expressed as a percentage, the tolerance is 0.12% ($137.5 / 115 \times 500 = 0.0011904$). If the cubical coefficient of thermal expansion for the product being measured is 0.0005 per °F, a 5 °F temperature difference represents a change in volume equal to 0.0025 or 0.25%. This amount is greater than 2 times the meter acceptance tolerance and more than the maintenance tolerance of 275 cubic inches. ($500 \text{ gallons} \times 0.0025 = 1.25 \text{ gallons} \times 231 = 288.75 \text{ cubic inches}$)

This example clearly illustrates the need for an accurate temperature measurement process.

With respect to the appropriateness of the present tolerance values on wholesale meters, it is the view of the Committee that they are too small rather than too large. When one considers the many variables in the test and measurement process, i.e., temperature, cubical coefficient of thermal expansion of the prover material, the tolerance and uncertainty of the prover, it is evident that tolerances should be increased. There is no question, however, that the meters used have the capability of a measurement precision or repeatability less than the tolerance limits.

303-7 REPORT OF THE NATIONAL TYPE EVALUATION TECHNICAL COMMITTEE (NTETC)

This Technical Committee (Meter and Measuring Systems Section) also met during the week of the interim meetings. The meeting results were almost as voluminous as those of the Scales and Weighing Systems Section and, therefore, cannot be included in this report. This material too, will be circulated prior to the conference to all the States and other interested organizations.

An outline of the subjects covered is presented below, and the Committee recommends Conference adoption of the material as circulated in its entirety for inclusion in the Handbook on Type Evaluation Examinations.

1. A section applicable to vehicle tank and wholesale meters.
2. Criteria applicable to service station equipment dealing with the technical means for cash/credit-debit operations.
3. Referred back to S&T Committee a recommendation for code amendment to S.1.4.1. in the Code for Vehicle Tank Meters. (See Item 304-2).

(Item 303-7 was adopted)

304 SECTION 3.31. VEHICLE TANK METER CODE

304-1 TEMPERATURE COMPENSATION

This subject has been a part of the Committee's report for the last several conferences, and the position of the Committee has been well documented and has not changed. At last year's conference, the recommendation of the

committee to include requirements applicable to temperature compensation technology in the code for vehicle tank meters was defeated. Those opposing the adoption of these requirements indicated that their main reason was that with automatic adoption of H-44 changes, it would allow for voluntary temperature compensation in the retail sale of fuel oil. To avoid this problem, their recommendation was to develop a separate code applicable to automatic temperature compensation.

Such a code was developed by a representative of the Northeast Conference, and submitted to the Committee for its review. It is the view of the Committee that it is not appropriate to have a separate code for temperature compensation technology for the following reasons:

1. In the previously recommended amendments to the Vehicle Tank Meter Code, paragraph UR.2.4. clearly states that temperature compensation is applicable only when the gallon is defined by State Law as a specified volume at a specific temperature. Thus voluntary temperature compensation is not allowed.
2. In the recommended separate code, there is an additional tolerance for temperature compensators. This tolerance is considered appropriate on vehicle tank meters when tested with 50-gallon or 100-gallon drafts, but is not considered appropriate for wholesale meters with drafts of 500 gallons or more, since the increased tolerance for larger drafts is sufficient to include any error caused by the temperature compensator. This is also true for LPG Meters, (i.e. larger tolerance values are sufficient to include the operation of the temperature compensator).
3. In the recommended separate code, there is reference to 60 °F. This temperature may be appropriate for certain products, but is inappropriate for many other products. Thus, the specific temperature is more appropriately referenced in the specific code for certain devices, e.g., water meters, agri-chemical meters, milk, cryogenics, etc.
4. H-44 does not contain separate Codes applicable to components. Such a Code would unnecessarily complicate the use of the Handbook. Consider, for example, the confusion that would result if separate codes with tolerances would be established for components such as a measuring element, a computing register, an air eliminator, or a remote console.

Therefore, it is the Committee's view that its recommendation made in last year's Report item 304-1 is the most appropriate resolution of the issue and the Committee recommends Conference action accordingly.

(A motion to table was defeated. Item 304-1 was defeated)

This item was referred to the committee by the NTETC. A concern was expressed that this paragraph could be interpreted to require a computing type digital electronic indicating element to provide a continual display of the unit price. It is the view of the Committee that under certain conditions, it is appropriate that these devices utilize a shared display, that is, the same display area can be used to indicate the volume delivered, the unit price, and the total price. Therefore, to clarify the intent of this paragraph the Committee recommends it be amended to read:

S.1.4.1. DISPLAY OF UNIT PRICE.- In a device of the computing type, means shall be provided for displaying on the outside of the device, ~~and-in-close-proximity-to-the-display-of-the-total-computed-price;~~ in a manner clear to the operator and an observer, the unit price per-gallon at which the device is set to compute.

(Item 304-2 was adopted)

The Office of Weights and Measures cooperated with the International Legal Metrology Program in the Fall of 1982 in developing a Preliminary Draft International Recommendation (IR) for Meters and Measuring Systems for Cryogenic Liquids for the consideration of SP5/SR15 of OIML. At the outset it was decided to review the H-44 Code and to develop such recommended changes as were deemed necessary to make the U.S. requirements appropriate for use as the basis of a Draft IR. Specific changes are therefore recommended in Section 3.34. to harmonize some of the U.S. requirements with the practices of the European gas industry and other changes are recommended to improve the adequacy of the H-44 requirements.

The following changes are recommended by the S&T Committee for adoption by the Conference.

A.1.- This code applies to devices used for the measurement of the cryogenic liquids oxygen, nitrogen, and argon, whether such devices are installed in a permanent location, or mounted on a vehicle, or mounted on a portable tank. ~~Insofar-as-they-are-clearly-appropriate,-the-requirements-and-provisions-of-the-code-may-be-applied-to-devices-used-for-the-measurement-of-other-liquids-that-do-not-remain-in-a-liquid-state-at-atmospheric-pressures-and-temperatures.~~

*A.2.- This code does not apply to devices used solely for dispensing a product in connection with operations in which the amount dispensed does not affect customer charges.

S.1.1.2. UNITS.- A device shall indicate and record, if equipped to record, its deliveries in terms of: pounds or kilograms; gallons or liters (NBP); ~~pounds-or-cubic feet of gas (NTP),~~ or decimal subdivisions or multiples thereof.

*The subsection has been completely revised.

S.1.1.3. VALUE OF SMALLEST UNIT.- The value of the smallest unit of indicated delivery, and recorded delivery, if the device is equipped to record, shall not exceed the equivalent of:

(a) For Small Delivery Devices

- (1) One-tenth gallon
- (2) One half liter
- (3) One pound
- (4) One half kilogram
- (5) Ten cubic feet of gas

(b) For Large Delivery Devices

- (1) One gallon
- (2) Five Ten liters
- (3) Ten pounds
- (4) Five Ten kilograms
- (5) One hundred cubic feet of gas

S.1.1.5. RETURN TO ZERO.- Primary indicating and recording elements shall be readily returnable to a definite zero indication. Means shall be provided to prevent the return of primary indicating elements, and of primary recording elements if these are returnable to zero, beyond their correct zero position.

S.1.4.2. MONEY-VALUE COMPUTATIONS.- Money-value computations shall be of the full-computing type in which the money value at a single unit price, or at each of a series of unit prices, shall be computed for every delivery within either the range of measurement of the device or the range of the computing elements, whichever is less. Value graduations shall be supplied and shall be accurately positioned. The value of each graduated interval shall be 1 cent. On electronic devices with digital indications, the total price total price may be computed on the basis of the quantity indicated when the value of the smallest division indicated is equal to or less than 0.1 gallon. The total price shall be computed on the basis of the quantity indicated when the value of the smallest division indicated is equal to or less than the values specified in S.1.1.3.

S.2.1. VAPOR ELIMINATION.- A measuring system shall be equipped with an effective vapor eliminator or other effective means to prevent the passage of vapor through the device where such vapor will cause over-registration of or tend to damage or degrade the device, the measurement of vapor that will cause errors in excess of the applicable tolerances. (See Sec. T.). Vent lines from the vapor eliminator shall be made of metal tubing or some other suitably rigid material.

S.2.4. AUTOMATIC TEMPERATURE OR DENSITY COMPENSATION.- A device may be equipped if a device is equipped with an adjustable automatic means for adjusting the indication and/or registration recorded representation of the measured quantity of the product ~~at the quantity-at-the-normal-boiling-point-of-the-specific-cryogenic-product~~, it shall indicate and/or record in terms of: pounds or kilograms; gallons or liters of liquid at the normal boiling point of the specific cryogenic product; or the equivalent cubic feet of gas at a normal temperature of 70 °F and an absolute pressure of 14.696 psi.

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 device or the discharge line therefrom, except that a manually controlled outlet that may be opened for purging or draining ~~for the purpose of preheating~~ the measuring system shall be permitted. Effective means shall be provided to prevent the passage of liquid through any such outlet during normal operation of the device and to indicate clearly and unmistakably when the valve controls are so set as to permit passage of liquid through such outlet.

S.4.3. TEMPERATURE OR DENSITY COMPENSATION.- If a device is equipped with an automatic temperature or density compensator, the primary indicating elements, recording elements, and recorded representations shall be clearly and conspicuously marked to show that the quantity delivered has been adjusted to the ~~quantity-at-the-normal-boiling-point-of-the-specific-cryogenic-product~~ conditions specified in S.2.4.

N.1. TEST LIQUID.- A meter shall be tested with the liquid to be commercially measured, ~~or with a liquid of the same general physical characteristics~~, except that, in a type evaluation examination, nitrogen may be used.

N.7. AUTOMATIC TEMPERATURE OR DENSITY COMPENSATION.- If a device is equipped with an automatic temperature or density compensator, the compensator shall be tested by comparing the quantity indicated or recorded by the device (with the compensator connected and operating) with the actual delivered quantity corrected to the normal boiling point of the cryogenic product being measured or to the normal temperature and pressure as applicable.

*T.1. APPLICATION.

T.1.1. TO UNDERREGISTRATION AND TO OVERREGISTRATION.- The tolerances hereinafter prescribed shall be applied to errors of underregistration and errors of overregistration.

*Section T.1. has been completely revised and replaced by T.1. and T.2. as indicated.

T.2. TOLERANCE VALUES.

T.2.1. ON NORMAL TESTS.- The maintenance tolerance on "normal" tests shall be two and one-half percent (2 1/2%) of the indicated quantity. The acceptance tolerance shall be one and one-half percent (1.5%) of the indicated quantity.

T.2.2. ON SPECIAL TESTS.- The maintenance and acceptance tolerance on "special" tests shall be two and one-half percent (2 1/2%) of the indicated quantity.

T.2. ON TESTS USING TRANSFER STANDARDS. becomes T.3.

UR.2.1. RETURN OF INDICATING AND RECORDING ELEMENTS TO ZERO.- The primary indicating elements (visual) and the primary recording elements ~~if these are returnable to zero~~ shall be returned to zero immediately before each delivery.

UR.2.2. CONDITION OF DISCHARGE SYSTEM.- The discharge system, up to the measuring element, shall be precooled to liquid temperatures before a "zero" condition is established prior to the start of a commercial delivery. ~~where vapor will cause overregistration of or tend to damage or degrade the meter.~~

*UR.2.5. CONVERSION FACTORS.- The conversion values established in NBS Technical Note 361, Revised, "Liquid Densities of Oxygen, Nitrogen, Argon, and Parahydrogen," shall be used whenever metered liquids are to be billed in terms of:

- a) pounds or kilograms based on a meter indication of gallons, liters, or cubic feet of gas; or,
- b) cubic feet of gas based on a meter indication of gallons, liters, pounds, or kilograms; or,
- c) gallons or liters based on a meter indication of pounds, kilograms, or cubic feet of gas.

All sales of cryogenic liquids shall be based on either pounds or kilograms, gallons or liters at NBP, or cubic feet of gas at NTP.

UR.2.6.2. TICKETS OR WRITTEN INVOICES.- Any written invoice or printed ticket based on a reading of a device that is equipped with an automatic temperature or density compensator shall have shown thereon that the quantity delivered has been adjusted to the quantity at the ~~normal-boiling-point~~ NBP of the specific cryogenic product or the equivalent volume of gas at NTP.

*This section has been completely revised editorially.

DEFINITIONS OF TERMS

**automatic temperature or density compensation.* The use of integrated or ancillary equipment to obtain from the output of a volumetric meter an equivalent mass, or an equivalent liquid volume at the normal boiling point of the product, or an equivalent gas volume at a normal temperature and absolute pressure of 70 °F and 14.696 psi.

cryogenic liquids. Fluids whose normal boiling point is below ~~123~~ 120 kelvins (~~-238-0F~~) (-243 °F).

large delivery device. Devices used primarily for single deliveries greater than ~~100~~ 200 gallons, ~~1-000~~ 2 000 pounds, ~~or-10-000~~ 20 000 cubic feet, 2 000 liters, or 2 000 kilograms.

*new definition added.

(Item 305 was adopted)

306 SECTION 4.43. CODE FOR FARM MILK TANKS

306-1 S.3.5.2. GAGE TUBE

The Committee received a comment that flexible tubing has and is being used successfully as gage tube material and that this paragraph should be amended to recognize this practice. The Committee received further information in support of the use of this material. It is the view of the Committee that, if rigidly supported flexible tubing is equal in performance to borosilicate glass or rigid plastic tubing, it should be recognized. Thus, the Committee recommends that this paragraph be amended by adding to the second sentence immediately after the words rigid plastic the following phrase, "or rigidly supported flexible tubing."

(Item 306-1 was adopted)

*306-2 N. NOTES

The Committee received a suggestion that a paragraph should be added to this part explaining the proper methodology for obtaining a reading defined by a meniscus. It is the view of the Committee that this is not necessary and offers the following for informational purposes.

When a reading or setting is to be obtained from a meniscus formed by water or other transparent liquid, the index or reading line is the position of the lowest point of the meniscus.

When a reading or setting is to be obtained from a meniscus formed by milk or other opaque liquid, the index or reading line is the position of highest point of the center of the meniscus.

When calibrating a device with water and the device is to be used with an opaque liquid, the reading should be obtained accordingly; that is, the position of the highest point of the center of the meniscus.

The Committee received a comment that paragraph S.1.4. PRINTED TICKETS was too restrictive with respect to new developments in the design of parking lot timing devices and meters. The communication also included a complete description of the new equipment and its method of operation. The referenced paragraph requires a printed representation of the time when service begins and the time when the services ends. It is the view of the Committee that the principle expressed is to provide this information to any user in a clear manner, and thus the requirement is appropriate when applied to an attended operation. However, when the device is intended for self-service (i.e., money operated), and the time of day is appropriately displayed, and the time that the service ends is available in a printed form, the user is provided sufficient information consistent with the principle expressed in the paragraph. Thus the Committee recommends this paragraph be amended to read:

S.1.4. PRINTED TICKETS.- A printed ticket issued or stamped by a timing device shall have printed clearly thereon:

- a. the time and day when the service ends and the time and day when the service begins, except that a self-service money-operated device that clearly displays the time of day need not record the time and day when the service begins, or
- b. the time interval purchased, and the time and day that the service either begins or ends.

(A motion to table was defeated. Item 307 was adopted)

308 SECTION 5.56. TENTATIVE CODE FOR GRAIN MOISTURE METERS

*308-1. REPORT OF THE ADVISORY COMMITTEE

The Advisory Committee on Grain Moisture Measurement was not able to meet during this past year. In order to provide some guidance to the Specifications and Tolerances (S and T) Committee, a Committee ballot was sent to the Advisory Committee and the S and T Committee. A tally of the votes is provided below:

Item 1. METER TEST METHODS AND TOLERANCES

Item 1.1. Test pads and pellets and other artificial capacitance devices can indicate whether the grain moisture meter is operating electrically within manufacturer's specifications, but cannot be used to determine the accuracy of grain moisture meters in measuring the moisture content of grain.

AFFIRMATIVE	NEGATIVE	ABSTAIN
19	0	4

Comment received: "We could support the use of an artificial means of check testing the electrical operations of a moisture meter. Pellets or other artificial capacitance devices could be helpful to the user in detecting problems with his meter. These devices can only be an indication of the operating conditions of the meter and cannot reflect the meter's accuracy. This type of device would need to be supplied by the manufacturer rather than placing the burden on the user to obtain a device with given characteristics. In addition, the use of artificial capacitance devices should be an option to the user, not a requirement."

Item 1-2. Grain must at some point be used in a testing program to compare the responses of a grain moisture meter with (a) the oven reference or (b) another meter.

AFFIRMATIVE	NEGATIVE	ABSTAIN
23	0	0

Comment received: "The commodities of interest are grains and must be used in a meter testing program. Since the dielectric properties of grains vary greatly and can be affected by many different variables, grain is needed in a test program. The reliability of using high moisture content grains in a field testing program for meters is questionable. However, high moisture grains would be needed for an oven calibration process."

Item 1-3. The proposed tolerances in the Handbook 44 Tentative Code are reasonable with respect to the precision of the transfer standard(s) (i.e., Paragraph 3.2 Sec. 1.11 of Handbook 44).

AFFIRMATIVE	NEGATIVE	ABSTAIN
12	3	8

Comment received: "The reasonableness of the tolerances in the tentative code has not been determined. There is very little information on meter testing programs using grain samples for other than corn and wheat. There are a number of other grains covered for which no data has been presented: sorghum, soybeans, sunflowers, flax, oats, barley, and grass seed. There are currently no tolerances for meter to meter testing."

Item 1-4. The proposed tolerances will need to be enlarged if master meter methods are to be recognized in the tentative code.

AFFIRMATIVE	NEGATIVE	ABSTAIN
9	3	11

Comment received: "Although I agree that the proposed tolerances in Handbook 44 are reasonable, we have no adequate data to say that they are the best or correct. Consequently, I am not ready to accept a specific plan for enlarging the tolerances for master meter methods. While it may

be necessary to change those tolerances, I have seen no data to indicate what the tolerances should be. I would like to know if the variance among brands of meters with a true moisture sample is more or less than the variance among meters of the same brand using a single sample of unknown moisture. Although theoretically master meter testing methods will have a greater variance than natural grain samples, we do not have empirical data to substantiate the fact nor to establish new values. For that reason, I would prefer to wait for more information before making any specific change to increase or reestablish tolerances. I think there are still many knowledge gaps before we establish tolerances in quantitative terms."

I am opposed to the use of the master meter as a testing program...the investment and the amount of error which must be incorporated into the tolerances would be too large."

"The master meter method should be discussed further at the July meeting before a decision is made to enlarge the proposed tolerances."

Item 2. FULLY AUTOMATIC METERS

Item 2-1. A requirement should be added to the tentative Handbook 44 code for further designs of grain moisture meters so that the grain does not have to be weighed before it is introduced into the grain moisture meter.

AFFIRMATIVE	NEGATIVE	ABSTAIN
6	10	7

Item 2-2. A requirement should be added for future designs of grain moisture meters so that the temperature of the grain (if needed to obtain a moisture content) is automatically sensed and compensated for by the device.

AFFIRMATIVE	NEGATIVE	ABSTAIN
8	7	8

Item 2-3. A requirement should be added for future designs of grain moisture meters that the device provide final moisture content values without the need for an operator to look up values or make computations.

AFFIRMATIVE	NEGATIVE	ABSTAIN
10	6	7

Comments on 2-1. through 2-3. received:

"Standards should reflect currently available technology and not dictate new designs or technology. When meters that are fully automated for weighing become readily available and in use, consideration can be given to this concept. There are many meters currently in use that can be used effectively along with an accompanying weighing device. The existing

devices should continue to be used as long as they are serviceable and accurate. There is a tendency to set cut-off dates and rule out existing equipment. There will be users who will want automatic meter requirements but until it becomes an industry practice, it should not be mandated. There is currently only one meter that claims to be able to weigh the sample accurately."

"Also, the requirements stated in Item No. 2, Subjects 1, 2, and 3, may very well reduce, and possibly eliminate, human error in obtaining the moisture content of grain but the price tag for such a device will be substantial. For the manufacturer of moisture meters who does not already have this type of meter in production, or even in the planning stage, the financial burden will be great. Also, the small grain operations, farms, and other users to grain moisture meters will not, or cannot, pay the high price for such a device."

"My concern with this item was whether it is appropriate for regulatory agencies to require fully automatic equipment."

"I believe specifications for moisture meters should be written in terms of performance with respect to accuracy; not with respect to convenience or honesty of the operator. Automatic meters will not eliminate fraud. If there are dishonest grain buyers, there are many ways to adjust weight, moisture, and price. Automation of moisture meters will have little, if any, effect on the number or magnitude of unfair payments to farmers. Unnecessary restrictions on the form and the cosmetics of the meter reduce competition in the meter industry (by eliminating some current manufacturers and brands) thus lowering quality, raising prices, and reducing freedom of choice of meter characteristics by elevators of different sizes and preferences. We can accept some design requirements to eliminate major sources of errors such as using outdated charts, etc.--Thus I could accept item 2-3 (although with some reluctance). Based on the principle of operator convenience and accuracy, automatic readout seems to me to reduce some dangers of operator error though I do not think it will have an impact on operator fairness or honesty. I feel that elevator operators should have a freedom of choice of whether they want a completely automated system of measurement just as they might choose a scale with an automatic printout or digital readout or some other particular form of quantity identification."

The Advisory Committee will meet during the Annual Meeting to discuss this ballot and other issues. It is fairly clear from this tally, however, that there is not the strong support for requirements for fully automatic devices that there appeared to be a short time ago and so the Advisory Committee will probably not recommend to the S and T Committee at this time, incorporation of sections requiring fully automatic devices.

308-2. STATUS

On the basis of the information presented in the previous item, the Committee recommends that the Advisory Committee be continued for another

year to complete their study and make final recommendations, that the Code remain tentative, and that no changes be made in it at the present time.

(Item 308-2 was adopted)

* 309 MEASURING DEVICES AND SYSTEMS FOR AGRI-CHEMICAL LIQUID
COMMODITIES

Since last year's Report referencing this subject, the Committee has received several communications. A letter was received from the Meter Manufacturers Technical Committee (MUTC) in which they offered their help in the development of a code or specific requirements applicable to these systems. The Committee received data from two jurisdictions on the performance of these devices. From this information it was obvious that these devices were not performing within the tolerance limits specified in the Liquid Measuring Device Code for wholesale meters, or those specified in the Vehicle Tank Meter Code.

It is the Committee's view that the establishment of appropriate tolerances values applicable to this equipment is essential. The Committee accepts the offer of the MMTC and requests that they submit a report to the Committee for its consideration at the 1984 Interim Meeting.

310 OTHER ITEMS

310-1 NONRETROACTIVE REQUIREMENTS

In accordance with the recommendation in Section 1.10, Introduction, paragraph 5, Classification of Requirements, the Committee has reviewed the following nonretroactive requirements, which have been effective for ten years or more, and recommends that the first two items remain non-retroactive and that the third become retroactive.

1.14. G-S.1. IDENTIFICATION--that part requiring a nonrepetitive serial number. (1968)

2.20. UR.2.4. FOUNDATION, SUPPORTS AND CLEARANCE--that part requiring the clearance between the platform and coping to be wider at the bottom than at the top. (1973)

3.30. S.2.5.1. ZERO-SET-BACK INTERLOCK--that part requiring the starting lever to be in its designed shut-off position and zero-set-back interlock to be engaged before the discharge nozzle can be returned to its designed hanging position. (1970)

(Item 310-1 was adopted)

*310-2 FIVE YEAR PLAN

The Committee has developed a five-year plan to aid it in carrying out its responsibilities. The plan outlines action to be taken by the Committee and recommended action by other organizations over the next five years.

The plan includes a procedure to systematically review all appropriate OIML documents impacting on the responsibilities of the Committee, to provide input to OIML, recommending amendment where deemed appropriate, and to recommend amendment to U.S. documents where deemed appropriate. It also includes a review of other publications, such as NBS H-105-1, 105-2, and 105-3, and a schedule for the Technical Committees of the Committee.

The work of the Committee is on schedule for 1983 and is reflected in this Interim Meeting Report. Highlights of items for the following four years are:

1984

- Finalize Code for Grain Moisture Meters.
- Review reports of Technical Committees including NTETC, Agri-Chemical measuring systems, and Belt-Conveyor Scales and make recommendations.
- Begin review of Fabric-and Wire-and Cordage-Measuring Device Codes and OIML International Recommendations.

1985

- Draft Codes for Belt-Conveyor Scales and requirements for Agri-Chemical measuring systems.
- Draft Code revision for Fabric-and Wire-and Cordage-Measuring Devices.
- Begin review of Liquid-Measuring-Device Codes, metering systems tolerances, and OIML International Recommendations.
- Begin review of NBS H-105, -2, & -3 and OIML International Recommendations.

1986

- Finalize Belt-Conveyor Scale Code and requirements for agri-chemical measuring systems.
- Finalize revisions of Fabric-and Wire-and Cordage-Measuring Devices.
- Draft Code for Liquid-Measuring Devices.
- Draft Revision of NBS H-105-1.

1987

- Finalize Liquid-Measuring Devices Code Revision.
- Finalize H-105-1 Revision
- Draft Revision to H-105-2, & -3.
- Begin review of Taximeters and Odometers Code and OIML International Recommendations.
- Begin review of Water Meters Code and OIML International Recommendations.
- Consider development of Draft Code on Electricity Meters.

This plan is, of course, flexible and is intended to aid the Committee in meeting the needs of the Conference. The Committee encourages comments from all interested parties.

*310-3 SECTION 3.32 LPG LIQUID-MEASURING DEVICES--S.2.7.1 FOR RETAIL
MOTOR-FUEL DEVICES/ZERO-SET-BACK INTERLOCK

The Committee has been requested to provide information concerning the availability of devices equipped with interlocks or retrofit units for existing equipment. The Committee has been informed that there are presently two or three manufacturers marketing equipment properly equipped with interlocks and several more with devices about to be marketed. They have also been informed that the Neptune Measurement Company has retrofit units for certain models and that there are others that cannot be retrofitted. The Committee reconfirms its position that newly installed equipment should be required to be in compliance and that each jurisdiction develop a practical program for conversion.

In continuation of established policy, the listing of OWM Reports of Test completed since last year is included at the end of this report.

The Committee expresses its sincere and grateful appreciation to all those offering comments and suggestions. In most instances, the information was presented in an orderly and effective manner, which greatly facilitated review of the information by the Committee and action thereon. It is only through such cooperative effort that the Conference can continue to attain uniform and equitable measurement standards. The Committee also expresses its appreciation to all those participating in the Interim Meeting. The comments and suggestions greatly aided the Committee in its deliberation.

L. H. DeGrange, Maryland, Chairman
S. A. Colbrook, Illinois
F. Gerk, New Mexico
D. A. Guensler, California
R. W. Probst, Wisconsin
O. K. Warnlof, Technical Advisor, NBS
A. D. Tholen, Executive Secretary, NCWM

COMMITTEE ON SPECIFICATIONS AND TOLERANCES

VOTING RESULTS - COMMITTEE ON SPECIFICATIONS AND TOLERANCES

VOTING KEY	<u>House of State Representatives</u>		<u>House of Delegates</u>	
	Yes	No	Yes	No
301-2	43	0	57	0
301-4				
301-12				
301-14				
303-3				
303-7				
304-2				
305				
306-1	2	34	9	38
308-2				
310-1				
301-3*				
301-3				
301-5				
301-7				
301-8				
301-11	38	2	48	0
303-1	41	1	50	0
303-2a	25	17	22	27
303-2b	22	20	16	36
304-1**	36	2	46	3
307	39	0	47	1
300	37	2	48	3
	38	2	48	2
	16	--	--	--
	22	15	28	19
	16	--	--	--
	37	1	39	2
	41	0	42	0

* motion on amendment

** motion to table

OMM REPORT OF TEST

Number	Date	Company	Model	Equipment Description	Capacity	n
568	3/31/83	J. A. King & Co.	K860	Counter Scale	5 lb	8 000
627	9/1/82	NCR Corp.	4000	Weighing Element	30 lb	3 000
628	9/1/82	Howe Richardson Co.	SSD-900	Portable Platform Scale	999.5 lb	1 999
629	9/1/82	Flex-Weigh Corp.	FLB 4872-10K	Self Contained Floor Scale	10 000 lb	10 000
630	9/1/82	Toledo Scale	2155	Weighing Element	5 000 lb	10 000
631	9/1/82	Fairbanks Weighing Division	12-1427	Railroad Track Scale	400 000 lb	8 000
632	9/1/82	Minnetonka Inc.	8201	Dry Measure	1/8 dry pt	
633	9/1/82	Minnetonka Inc.	8205	Dry Measure	1/4 dry pt	
634	9/1/82	Toledo Scale	8408	Price Computing Scale	30 lb	3 000
635	9/15/82	Sweda International, Inc.	5630	Electronic Cash Register	30 lb	3 000
636	9/15/82	Sweda International, Inc.	7625	Electronic Cash Register	30 lb	3 000
637	9/15/82	Sweda International, Inc.	7631	Electronic Cash Register	30 lb	3 000
638	11/1/82	Cardinal Scale Mfr. Co.	DI 910	Indicating Element	1250 lb	12 500
639	11/1/82	Liquid Controls Corp.	EC-2000	Computing Meter Register		
640	12/1/82	Hobart Corp.	1860	Computing Scale	30 lb	3 000
642	12/1/81	National Controls, Inc.	3147A	Weighing Element	10 000 lb	5 000
643	11/15/82	Fairbanks Weighing Division	90-8821	Indicating Element		8 000
644	11/15/82	NCR Corp.	2126	Electronic Cash Register	30 lb	3 000
645	11/15/82	Tokyo Electric USA, Inc.	SL 39-30L	Computing Scale	30 lb	3 000
646	11/15/82	Tokyo Electric USA, Inc.	ML-2300-10	Electronic Cash Register	30 lb	3 000
647	11/15/82	Seedburo Equipment Co.	8850	Grain Test Scale	2 000 g	5 000
648	11/15/82	Holtgreven Scale/Electronics	FT 6010	Weighing Element	200 000 lb	10 000
649	11/15/82	Franklin Electric	5306500100	Pre-Packaging Scale	30 lb	3 000
650	12/1/82	Toledo Scale	8139	Indicating Element		3 000
651	12/1/82	Fairbanks Weighing Division	E12-1495	Railroad Track Scale	720 000 lb	20 000
652	12/1/82	Shelk Electronic Scale	1502	Computing Scale	30 lb	3 000
653	12/1/82	Pennsylvania Scale Co.	BASE 100	Weighing Element	100 lb	5 000
654	12/1/82	Victor Business Products	3108	Electronic Cash Register	30 lb	3 000
655	12/1/82	Mettler Instrument Corp.	RE 2012A	Jeweler's Balance	210 g	21 000
656	12/1/82	Mettler Instrument Corp.	RE 2021A	Jeweler's Balance	2 000 g	20 000
657	12/15/82	Flex-Weigh Corp.	DWM-II	Indicating Element		10 000
658	12/15/82	Flex-Weigh Corp.	UWI	Indicating Element		5 000
659	12/15/82	Flex-Weigh Corp.	7000	Tape Printer		
660	12/15/82	OMRON Electronics, Inc.	RS15-50	Electronic Cash Register	30 lb	3 000
661	12/15/82	New Brunswick International	DS-90C	Counter Scale	150 lb	3 000

OWN REPORT OF TEST

Number	Date	Company	Model	Equipment Description	Capacity	n
662	12/15/02	Petroleum Meter & Pump Co.	PMF 40075	Retail Motor Fuel Disp.	Computer	
663	1/31/03	Pennsylvania Scale Co.	1000	Indicating Element	999.9 gal	5 000
664	1/17/03	Pennsylvania Weighing Division	1170-46495-1	Beam Scale	10 lb	5 000
665	1/17/03	New Brunswick International	182-210	Counting Scale	10 lb	1 000
666	1/17/03	Streeter/Met	9000	Indicating Element		10 000
667	3/31/03	J. A. King and Co.	K 750 S	Counter Scale	26.0 g	5 120
668	3/31/03	NGR Corporation	2950	Service Station Outside Weighing Element	150 lb	1 000
669	3/31/03	Wetado Scale	2100	Counting Scale	6 lb	600
670	3/31/03	Wetado Scale	1040	Indicating Element	100 lb	10 000
671	3/31/03	Metro Equipment Corp.	EPF-10K	Jewelers Balance	160 lb	160 000
672	3/31/03	Mettler Instrument Corp.	EP 160749	Field Standard Test Measure	5 gal	
673	3/31/03	El Paso, Inc.	PS202-50	Electronic Cash Register	10 lb	1 000
674	3/31/03	NGR Corporation	2110-1214	Self-Contained Vehicle Scale	120 000 lb	6 000
675	3/31/03	Streeter/Met	1004100	Vehicle Scale Weighing Element	120 000 lb	12 000
676	7/1/03	CHL Corporation	8-701010	Tachometer	999.99	
677	6/30/03	Electronics Innovations Ltd.	800AX 10	Tachometer	999.99	
678	6/30/03	Control Devices, Inc.	95-14-2	Tachometer	999.99	
679	6/30/03	Control Devices, Inc.	95-14-2-3	Tachometer	999.99	
680	6/30/03	Analogic Corp.	AN5 316	Indicating Element	10 lb	10 000
681	6/30/03	Tokyo Electric USA, Inc.	10-91101-A12	Pre-Packaging Scale	70 lb	1 000
682	6/30/03	National Controls, Inc.	7470	Postal Weight Classifier	10 lb	2 240
683	6/30/03	Sharp Electronics Corp.	ES-3536	Electronic Cash Register	10 lb	3 000
684	6/30/03	Sharp Electronics Corp.	ER-4240	Electronic Cash Register	10 lb	3 000
685	6/30/03	Reyon Arizona, Inc.	9000	Counting Scale	10 lb	1 000
686	6/30/03	Tokyo Electric USA, Inc.	2200-175-CUP	Electronic Cash Register (UPS System)	99.99 lb	4 999
687	7/1/03	Pennsylvania Scale Co.	6000	Weighting Element	100 lb	10 000
688	7/1/03	Wetado Scale	14000E	Counting Scale	10 lb	1 000
689	7/1/03	Wetado Scale	121	Label Printer		
690	7/1/03	National Controls, Inc.	5700	Indicating Element	1000 lb	20 000
691	7/1/03	Harus Scale Co.	C-10000-1	Counting Scale Weighing Element		1 000
692	7/1/03	IM Instruments	10-12001	Indicating Element	200 lb	10 000
693	7/1/03	Reyon Arizona, Inc.	MS-2	Weighting Element	15 lb	3 000
694	7/3/03	Electronics Scales Int'l	30050a	Counting Scale	10 lb	3 000
695	7/3/03	Electronics Scales Int'l	30701	Weighting Element		
696	7/3/03	American Scale Co., Inc.	AP6-2000	Indicating Element		10 000

OWM REPORT OF TEST

Number	Date	Company	Model	Equipment Description	Capacity	n
697	7/8/83	Monterey Measurements	Lion 100	Computing Scale	22 lb	2 200
698	7/8/83	Ormond, Inc.	OBW-1	Bench Scale	100 lb	10 000
699	7/8/83	TEC America, Inc.	SL31-30N	Computing Scale	30 lb	3 000
700	7/8/83	TEC America, Inc.	SW12300-L-L-XX-US	Bench Scale	300 lb	3 000
701	7/8/83	Omron Electronics, Inc.	RS16-50	Electronic Cash Register	30 lb	3 000
702	7/8/83	Electroscale Corporation	401	Bench Scale	100 lb	10 000
703	7/15/83	Electronic Scales Int'l	SP-1	Label Printer	30 lb	3 000
704	7/15/83	Hardy Scales, Inc.	2020	Indicating Element		20 000
705	7/15/83	Int'l Weighing Systems	12-50SP	Weighing Element	50 lb	5 000
706	7/15/83	Int'l Weighing Systems	CS-1400	Indicating Element		5 000
707	7/15/83	National Controls, Inc.	3147A	Weighing Element	10 000 lb	5 000

ADDENDUM TO REPORTS OF TEST

Number	Date	Company	Model
372	9/1/82	Nat'l Cash Register Corp.	255
414	9/1/82	Nat'l Cash Register Corp.	2552
546	8/6/82	Metro Equipment Corp.	ACS - 1611
431	12/15/82	Data Terminal Systems, Inc.	540, 2540, 5540
541	11/15/82	Consolidated Controls Corp.	UMC 2000
571	11/15/82	National Controls, Inc.	4000
580	12/1/82	Measurement Systems Int'l	MSI 4260
624	12/15/82	OMRON Electronics, Inc.	RS 80-20
623	1/17/83	Scientech, Inc.	SE 5000
514	7/1/83	Lockheed	900
550	7/1/83	Weldotron	UPC System 5000

REPORT OF THE
COMMITTEE ON EDUCATION, ADMINISTRATION,
AND CONSUMER AFFAIRS

Presented by JOSEPH L. SWANSON, Director,
Division of Measurement Standards, State of Alaska

VOTING KEY

400

INTRODUCTION

The Committee on Education, Administration, and Consumer Affairs submits its final report to the 68th National Conference on Weights and Measures. The report consists of the tentative report as offered in the Conference Announcement, and as amended by the final report. The report represents recommendations of the committee that have been formed on the basis of written and oral comments received during the year and oral presentations made during the general meeting of the committee.

The Chairman announced that only Item 405, National Training Program, is a voting item and that all other items are informational. The Chairman moved approval of Item 405. The motion carried as follows:

	<u>Yes</u>	<u>No</u>
State Representatives	44	0
Delegates	51	0

The Chairman moved adoption of the entire report with editorial privileges to the Executive Secretary. The motion carried as follows:

	<u>Yes</u>	<u>No</u>
State Representatives	44	0
Delegates	57	0

401

NATIONAL WEIGHTS AND MEASURES WEEK

Co-Chairmen Bruce Niebergall, North Dakota, and Peggy Adams, Bucks County, Pennsylvania, reported the following to the Committee: The list of State Weights and Measures Week Coordinators was updated and furnished to associate members for their use in providing promotional material. A packet of educational and advertising aids was developed by Peggy Adams and will be mailed to jurisdictional Coordinators. This material and other information will be used to formulate a reference manual on promotion and education of weights and measures with emphasis on National Weights and Measures Week. Jurisdictions are requested to mail any current promotional materials to Peggy Adams.

The Committee appointed Phil Stagg of Louisiana and Peggy Adams of Bucks County, Pennsylvania, as Cochairmen for National Weights and Measures Week 1984.

The Committee would like to thank the Scale Manufacturers' Association, the American National Metric Council, Hobart Corporation, Fairbanks Weighing Division, and the Institute for Weights and Measures for the excellent promotional materials provided.

402

NATIONAL ADVERTISING PROGRAM

Dick Hurley of Fairbanks Weighing Division of Colt Industries reported to the Committee that he was pursuing several avenues to obtain support for a national advertising program and had initiated correspondence with his Congressional delegation, the U. S. Office of Consumer Affairs and other Associate members.

He is also formulating a plan to present to the National Association of Broadcasters to promote a national advertising campaign.

403

NATIONAL PROGRAM EVALUATION

Work is continuing on refinement of Program Evaluation Criteria and further evaluations will be conducted as we advance into the third phase (Program Evaluation) of the National Training Program. However, if an urgent request for an evaluation is received by the Committee in the interim every effort will be made to answer such request.

404

NATIONAL CERTIFICATION PROGRAM

The Certification process has been incorporated into the production schedule of the modules as outlined in item 405, Table 7.

405

NATIONAL TRAINING PROGRAM

This section describes the plan of the Committee on Education, Administration, and Consumer Affairs, of the National Conference on Weights and Measures (NCWM) for development of the Primary Training Materials of the National Training Program.

The Committee worked on this plan at the 67th Annual Meeting of the NCWM in Atlanta, Georgia during the week of July 12, 1982, at the special meeting of the Committee on September 18, 1982 just prior to the meeting of the Western Weights and Measures Association in Utah, and at the Interim Meeting held at NBS during the week of January 16, 1983.

The Committee:

1. Reordered its priorities in order to focus on development of the primary training materials.
2. Defined the training modules to be developed and their application.
3. Established a format for development of the modules.

4. Identified the need for seven Working Groups to develop the draft material for thirteen modules, and recommended membership of these Working Groups.
5. Agreed on contractor for development of technical modules and support of the Working Groups.
6. Established a schedule for module development.
7. Developed an outline work statement for contractor performance.
8. Outlined procedures for management of proposed grant and related contract.

I. INTRODUCTION

A. General

This presentation is based on the Plan for a National Training Program, developed by the Committee on Education, Administration, and Consumer Affairs, NCWM, and approved by the NCWM membership at the 67th Annual Meeting in Atlanta, Georgia on July 15, 1982.

That Plan describes the need for formalized training materials in three general categories:

1. Primary Training
2. Continuing Education
3. Specialized Education

B. Primary Training

Primary Training is considered the key for subsequent evolvement of:

1. A Certification Program; and
2. A State Program Evaluation Plan.

The National Training Program (Primary Training) and its individual modules of training materials number thirty-seven (37). As each module is completed and published, it will become a resource for training (and subsequent certification) of state officials. (This certification can take several forms: a National/State Program, or individual State Programs existing or developed to meet local needs). As the National Certification Program evolves, it will provide the basis for evaluating the staffing of State weights and measures programs.

C. Concept

The products of this program will be "hard copy" manuals and training aids designed for use by State and local weights and measures jurisdictions for training their personnel. The materials will be produced as "modules" of training. Table 1 lists the training modules currently identified for development. Modules 1-22 deal with Weights and Measures functions; Modules 23-37 are elective and may be used at the discretion of the training agency (see section on "Modules").

First drafts for Modules 1 through 25 will be developed by working groups of experts representing Federal, State, and local jurisdictions and industry. These working groups will draw on work previously completed by other organizations (several working groups will start with manuals developed by the State of Alaska). Subsequently, the Contractor will convert the Working Group developed drafts into final student manuals.

Modules 26 through 37 will be developed completely on contract.

TABLE 1
TRAINING MODULES

Weights and Measures Functions	Module No.	Module Title
Retail Computing Scales-Mechanical & Electronic	1.	Mechanical Cylinder, Fan Computing, and Pre-package.
	2.	Digital Electronic Computing and Electronic Cash Registers.
Bench, Counter & Hanging Scales	3.	Bench, Counter, & Hanging Scales, Automatic & Nonautomatic, Indicating.
Medium Capacity Scales, Dormant & Industrial	4.	Counter, Portable, Floor, & Built-In, Automatic & Nonautomatic, Indicating.
Vehicle & Axle Load Scales	5.	Vehicle & Axle Load, Mechanical & Electronic.
	6.	Monorail Scales & Meat Beams.
Livestock & Animal Scales	7.	Livestock & Animal, Mechanical & Electronic.
Retail Motor Fuel Dispensers	8.	Single Product, Blend and Twin Motor Fuel Dispensers-Mechanical & Electronic.
	9.	Gasoline Dispenser Electronic Consoles.
Checking Net Contents of Packaged Goods	10.	Random, Standard, Mass, Liquid, Linear, Special Products.
Small Capacity Balances & Test Scales	11.	Prescription and Jewelers Balances.
	12.	Cream Test, Moisture Test, and Grain Test Scales.
Hopper Scales	13.	Automatic Grain Hopper, Construction Material Hopper, Mechanical & Electronic.

TABLE 1 (Continued)

Wheel Load Weighers	14.	Wheel Load Weighers, Mechanical & Electronic
Belt Conveyor Scales	15.	Belt Conveyor Scales, Mechanical & Electronic.
Weights-Equal Arm & Counterpoise	16.	Weights-All Types.
Liquid Measures	17.	Hand Crank Fuel Pumps.
Other Retail Measuring Devices	18.	Lubricant Devices, Motor Oil Bottles
Large Capacity Meters	19.	Loading Rack Meters.
	20.	Vehicle Tank Meters, Power Operated & Gravity, Compensated & Uncompensated.
Liquefied Petroleum Gas Meters	21.	LPG Liquid & Vapor Meters, Retail & Wholesale & Motor Fuel Devices.
Labeling of Packaged Products	22.	Net Contents Statement, Responsibility, Method of Sale.

ELECTIVE MODULES

Weights and Measures Admini- stration Device Technical Requirements	23.	Functions, History, Organiza- tion, Legal Authority, Penalties.
	24.	HB44 Organization and Use.
Communications	25.	Weights & Measures Officials, Device Owners & Operators, Industry, Consumers.
Electronics	26.	Analog Technology; DC Circuits, AC Circuits.
	27.	Digital Technology; Numbering Systems, Digital Circuits.
	28.	Solid State Circuits and Applications.
	29.	Analog-to-Digital Conversion.

TABLE 1 (Continued)

	30.	Load Cells.
	31.	Time and Frequency.
	32.	Electrical Standards.
	33.	Ground Loops.
	34.	Electrical Safety.
	35.	Terminology.
Electrical Measurements	36.	Instrument Noise.
Computer Technology	37.	Microprocessor Based Systems, Automatic Control Systems.

D. Funding

The National Conference on Weights and Measures has submitted a proposal to the National Bureau of Standards for a grant to fund the first two years of development of this Program. The stated purpose of the Grant is:

"To provide for the development of manuals and other materials to be used in a national, uniform training program for State and local weights and measures officials." The proposal requires funding over a two year period of:

Year 1 -	\$148,405
Year 2 -	\$166,784
	<hr/>
	\$315,189

II. MODULES

A. General

Each module will be an independent, self-contained training course containing the student manuals (based on material developed by the Working Groups), instructors manuals, and related slides, overhead transparencies and classroom equipment (developed by the Contractor).

Use of these modules will assist local jurisdictions in training both veteran and new employees; the skills of the experienced official will be refreshed and upgraded; the new employee will be trained on a structured and uniform basis.

Organizational freedom of choice will be provided to the State and local jurisdictions. They may select only the module or modules needed for a particular training session. Training can be provided by the employee's organization or by other qualified trainers or organizations. Modules can be used by individuals for refresher purposes or self-training. Finally, the modules can serve as a basis for State certification or qualification programs; each module will contain examinations on material covered.

B. Module Format (Weights and Measures Functions)

Each of modules 1 through 22 will provide subject-related training designed to develop the competence of the student to carry out both the regulatory and technical functions of the inspector for a specific weights and measures function. The material will be organized to lead the student through formal classroom training including:

1. Introduction to the training program (common to all modules)
2. Introduction to the specific function of the given module
3. Inspection Procedures
4. Post Inspection Procedures (Approval or Rejection); and
5. Summary

Following successful completion of the classroom training, each module will provide material for both supervised and unsupervised field training.

Interspersed throughout the training material will be structured quizzes designed to measure student comprehension. Completion and mastery of a given module should prepare the student for certification in that weights and measures function or major portion of a function. Table 2 contains the proposed Contents of Modules 1 through 22.

C. Module Format (Elective Modules)

Separate modules will be developed, which may be selectively used independent of the functional modules or integrated into a training program with one or more other modules. These elective modules provide training material for general regulatory subjects (modules 23, 24, 25) or specific technical areas (modules 26 through 37). This modular development provides a wide range of discretion to the jurisdiction to tailor the training for the specific needs of its staff.

TABLE 2

FORMAT OF THE CONTENTS OF MODULES 1-22

Related Modules in the Primary Training Program

Introduction to Module

- Objectives
- Background
- Instructional Procedures

Introduction to (Vehicle and Axle Load Scales)

- Fundamentals
- Applications

QUIZ

Inspection

- General Considerations
- Purposes
- Requirements
- Procedure for Conduct of Inspection
- Recording Information
- Analysis of Findings

QUIZ

Approval or Rejection Action

- Approval
- Rejection
- Adjustment and Repair
- Follow-up
- Retests

QUIZ

Summary

MODULE EXAM

Supervised Field Exercises

- Objectives
- Plan
- Field Exercises
- Supervisors Evaluation

Unsupervised Field Exercises

- Objectives
- Plan
- Field Exercises
- Reporting

CERTIFICATION BOARD

Example 1: To provide a training program in vehicle and axle load scales for a group of inspectors with prior experience in regulatory work dealing with Retail Computing Scales, and with prior basic electronics training, the instructor would use:

- module 5

Example 2: Assuming inspectors had prior regulatory experience in mechanical devices only, the instructor might select:

- module 5, plus
- one or more of modules 26 through 37.

Example 3: Assuming inspectors are new hires with no previous regulatory experience but have had electronics training, the instructor might select:

- module 23, 24, 25 plus
- module 5

Modules 23-25.

Suggested contents for Model 23 are listed in Table 3; for Module 24 in Table 4; for Module 25 in Table 5.

TABLE 3

FORMAT OF THE CONTENTS OF MODULE 23
WEIGHTS AND MEASURES ADMINISTRATION

- Part 1.--Functions of the weights and measures official
 - Responsibilities and duties of official
 - Mechanical activities
 - Supervisory activities
 - Apportionment of effort
 - Summation
- Part 2.--Historical background and review of Federal weights and measures legislation in the United States
 - The interstate commerce clause
 - The weights and measures clause
 - Colonial action
 - The Jefferson report
 - The first Federal law
 - The Adams report
 - The troy pound of the mint
 - Hassler's early activities
 - The Joint Resolution of June 14, 1836
 - The Act of July 7, 1838
 - The Act of July 28, 1866, and the Joint Resolution of July 27, 1866
 - The Joint Resolution of March 3, 1881
 - Standards and balances furnished to States
 - Effects of Congressional action
 - The Metric Convention
 - The "Mendenhall Order"
 - The International Yard and International Pound
 - New definition of the meter
 - Federal legislation proposed and enacted
- Part 3.--State and local weights and measures legislation
 - Commercial equipment and practices
 - State coverage
 - Compilation of Federal and State laws
- Part 4.--Current organization for weights and measures in the United States
 - The National Bureau of Standards
 - The U.S. Department of Agriculture
 - The U.S. Department of Health and Human Services
 - The Federal Trade Commission
 - The U.S. Treasury Department
 - Reference to Federal agencies
 - State organizations
 - Exclusive State operation
 - Dual State and local operation
 - Local operation under State supervision

Part 5.--Units and Systems of Weights and Measures

Part 6.--Investigation of complaints

Special investigator

Testimony

Action following investigation

Reports of investigations

Part 7.--Independent investigations

Planning and investigation

Analysis and presentation of results

Part 8.--Prosecutions

Administrative discretion

Criminal and civil statutes

Preliminary considerations

Restitution

Probability of successful prosecution

Charging principal or agent

Charging a corporation

Vigor of prosecution effort

Exhibits

Records and memoranda

Witnesses

The representation

Quantity determinations by the official

Safeguarding the evidence

Evidence

Preliminary hearings

The law

The complaint

The trial

Appeals

Decisions

Personal aspects

Part 9.--Cooperation with other State and local officials and with

Federal agencies

Out-of-State manufacturers or packers

Exchange of information

Federal laws and agencies

Part 10.--Regional and State Weights and Measures Associations

Part 11.--National Conference on Weights and Measures

TABLE 4

FORMAT OF THE CONTENTS OF MODULE 24
DEVICE TECHNICAL REQUIREMENTS

Part 1.--Specifications, tolerances, and regulations

Scope and purpose

Development

Advantages of uniformity

Promulgation

Regulations

Part 2.--Handbook 44

Introduction

Fundamental Considerations

General Code

Specific Codes

Procedures for Change

Part 3.--Related Handbooks

TABLE 5

FORMAT OF THE CONTENTS OF MODULE 25
COMMUNICATIONS

Part 1.--Relations with manufacturers and dealers

- Impartiality
- Intimacy
- Gratuities
- Comments
- Commercial advantages
- Financial interest
- Cooperation

Part 2.--Education of the users of weighing and measuring devices

- Scope
- Maintenance of equipment
- Improvements in methods and equipment
- Cooperation
- Procedures
- Exhibits and audio and visual aids
- Demonstrations
- Charts and slides
- Motion pictures
- Trade publications

Part 3.--Education of the public

- Scope
- Visual and audio aids
- Television broadcasting
- Exhibits
- Publications for distribution
- Continuity of effort

Part 4.--Publicity

- Essential characteristics
- Sources
- Preparation of releases
- Distribution of releases
- Reader interest
- News value

III. WORKING GROUPS

A. General

The functional modules will be developed by working groups made up of experts in the specific functions being addressed. Each working group will consist of at least three individuals:

1. A member of the Committee on Education, Administration, and Consumer Affairs (to coordinate the developmental work with the Committee, the NCWM, the NBS(OWM), and the NCWM contractor(s)).
2. Two subject experts: a regulatory official and an industry representative.

More working groups will be needed as work is started on other modules. Therefore the committee earnestly solicits volunteers from the active and associate membership to make up future working groups. We invite interested persons to notify the Committee in writing of their desires.

B. Composition of Working Groups

Table 6 contains the identification of the first seven working groups being established and the candidate members. Other working groups will be established as work progresses.

<u>Working Group</u>	<u>To Develop Module(s)</u>	<u>Module Title(s)</u>	<u>Candidate Members</u>
A	1 2	Mechanical Cylinder, Fan Computing, and Pre-package Scales. Digital Electronic Computing Scales and Electronic Cash Registers.	B. Niebergall**, ND F. Nagle*, MI F. Katterheirich, Hobart T. Geiler*, MA L. Dragetti, MA R. Hurley*, Fairbanks
B	3 4	Bench, Counter, & Hanging Scales, Automatic & Nonautomatic Indicating. Counter, Portable, Floor, & Built-In, Automatic & Nonautomatic Indicating Scales.	
C	5	Vehicle & Axle Load, Mechanical & Electronic Scales.	J. Swanson**, AK D. Guensler*, CA W. Goodpaster, Cardinal S. Darsey**, FL T. Scott*, NC J. King, J. A. King D. Pichard, P&S
D	6 7	Monorail Scales & Meat Beams. Livestock & Animal, Mechanical & Electronic Scales.	
E	8 9	Single Product, Blend and Twin Motor Fuel Dispenser-Mechanical & Electronic. (Retail Motor Fuel Dispenser) Gasoline Dispenser, Electronic Consoles.	T. Geiler**, MA S. Colbrook*, IL W. Gerdorn, Tokheim
F	10	Checking Net Contents of Packaged Goods.	J. Swanson**, AK J. Stewart, VA C. Brickenkamp*, OWM C. Kloos
G	23 24 25	Legal Authority. NBS Handbook 44. Communications.	P. Staggs*, LA C. Forrester, TX L. Phillips, TEEX R. Smith, OWM*

IV. ORGANIZATIONAL RESPONSIBILITIES

A. General

Overall responsibility for development of the Primary Training Program rests with the NCWM leadership. Specific responsibilities are:

1. Finance Subcommittee of the NCWM Executive CTE - Administer the grant and contract(s) made possible by the grant.
2. Education, Administration, and Consumer Affairs Committee
 - provides overall technical management with assistance from NBS (OWM).
 - acts as Finance Subcommittee's representative for evaluating the technical performance of contractor(s)
 - coordinates and reviews work of the working groups
3. Working Groups, NCWM - Development of draft modules.

B. Contractor(s)

The Contractor will be responsible for:

1. Conversion of working group drafts of student manuals into "camera ready" final manuals;
2. Development of Elective Technical student manuals (modules 26-37);
3. Development of Instructor manuals to accompany all student manuals;
4. Development of slides and graphics for all manuals; and
6. Producing the manuals in accordance with Year 1 of the Production Schedule. (see Table 7).

In summary, the contractor will produce final modules, each consisting of:

1. instructor's manual
2. student's manual
3. electronic manuscript compatible with NBS equipment
4. negatives of slides used
5. one copy of each module is to be assembled in final format

V. SCHEDULE OF WORK

A. General

Development of the Primary Training Program is expected to extend over a period of 6 1/2 years. The major responsibilities and events are depicted in Table 6 of the NCWM Plan.

Major events in this plan are considered critical and must take place as specified for the completion of the program. These are as follows:

1. Approval of NBS Grant to Conference to support program must occur by January 1983.
2. Contractor work statement completed by Education Committee and ready for review by NCWM Executive Committee (December 1982).
3. Conference management approves contractor work statement during Interim Meeting January 1983.
4. Contract is awarded to Contractor in February 1983.
5. First working group was established for module preparation in January 1983.
6. Working group initiated work in January 1983.
7. Contractor initiates work in March 1983.

B. Single Module Development

Module development will be staggered over the 6 1/2 year period commencing with work by the first working group in January, 1983.

Each module is scheduled for a two year development period following the following work schedule:

D day - Working Groups begin.

D+6 months - 1st working draft of student manual to review by Education Committee.

D+8 months - Education Committee completes review; revised draft to Contractor with comments.

D+12 months - Contractor completes drafts of Student and Instructor Manuals. To Education Committee for review.

D+14 months - Draft to selected jurisdiction(s) for field test.

D+20 months - Education Committee completes review.

D+22 months - Education Committee and Contractor complete final review.

D+24 months - Module published by Contractor.

C. Program Development

The NCWM Education Committee has established a schedule for development and production of the modules (Table 7). This schedule provides for interspersing of development of the Elective Technical Modules by the Contractor(s) subject to negotiation between the NCWM and Contractor(s) concerning work that can be done within the anticipated funding.

TABLE 7
PRODUCTION SCHEDULE(a)

Item #	Mod #	D	D+6	D+8	D+12	D+14	D+20	D+22	D+24(b)
1	1(c)	1/83	7/83	9/83	1/84	3/84	9/84	11/84	1/85
2	2(c)	2/83	8/83	10/83	2/84	4/84	10/84	12/84	2/85
3	ET(c)	3/83	9/83	11/83	3/84	5/84	11/84	1/85	3/85
4	8(c)	4/83	10/83	12/83	4/84	6/84	12/84	2/85	4/85
5	9(c)	5/83	11/83	1/84	5/84	7/84	1/85	3/85	5/85
6	ET(c)	6/83	12/83	2/84	6/84	8/84	2/85	4/85	6/85
7	23(c)	7/83	1/84	3/84	7/84	9/84	3/85	5/85	7/85
8	24(c)	8/83	2/84	4/84	8/84	10/84	4/85	6/85	8/85
9	ET(c)	9/83	3/84	5/84	9/84	11/84	5/85	7/85	9/85
10	5(c)	10/83	4/84	6/84	10/84	12/84	6/85	8/85	10/85
11	25(c)	11/83	5/84	7/84	11/84	1/85	7/85	9/85	11/85
12	ET(c)	12/83	6/84	8/84	12/84	2/85	8/85	10/85	12/85
13	3(c)	1/84	7/84	9/84	1/85	3/85	9/85	11/85	1/86
14	4(c)	2/84	8/84	10/84	2/85	4/85	10/85	12/85	2/86
15	ET(c)	3/84	9/84	11/84	3/85	5/85	11/85	1/86	3/86
16	6(c)	4/84	10/84	12/84	4/85	6/85	12/85	2/86	4/86
17	7(c)	5/84	11/84	1/85	5/85	7/85	1/86	3/86	5/86
18	ET(c)	6/84	12/84	2/85	6/85	8/85	2/86	4/86	6/86
19	--	7/84	1/85	3/85	7/85	9/85	3/86	5/86	7/86
20	--	8/84	2/85	4/85	8/85	10/85	4/86	6/86	8/86
21	ET	9/84	3/85	5/85	9/85	11/85	5/86	7/86	9/86
22	--	10/84	4/85	6/85	10/85	12/85	6/86	8/86	10/86
23	--	11/84	5/85	7/85	11/85	1/86	7/86	9/86	11/86
24	ET	12/84	6/85	8/85	12/85	2/86	8/86	10/86	12/86
25	--	1/86	7/85	9/85	1/86	3/86	9/86	11/86	1/87
26	--	2/85	8/85	10/85	2/86	4/86	10/86	12/86	2/87
27	ET	3/85	9/85	11/85	3/86	5/86	11/86	1/87	3/87
28	--	4/85	10/85	12/85	4/86	6/86	12/86	2/87	4/87
29	--	5/85	11/85	1/86	5/86	7/86	1/87	3/87	5/87
30	ET	6/85	12/85	2/86	6/86	8/86	2/87	4/87	6/87
31	--	7/85	1/86	3/86	7/86	9/86	3/87	5/87	7/87
32	--	8/85	2/86	4/86	8/86	10/86	4/87	6/87	8/87
33	ET	9/85	3/86	5/86	9/86	11/86	5/87	7/87	9/87
34	--	10/85	4/86	6/86	10/86	12/86	6/87	8/87	10/87
35	--	11/85	5/86	7/86	11/86	1/87	7/87	9/87	11/87
36	ET	12/85	6/86	8/86	12/86	2/87	8/87	10/87	12/87

- (a) Module 10 "Checking Net Contents of Packaged Goods" will be developed outside the scope of the production schedule.
- (b) The meaning of each heading is explained in the text on the preceding page.
- (c) Twelve Primary Training Modules and 6 Elective Technical Modules assigned for the first 18 months of program development; the remainder will be assigned after input on priority from the membership.

During the Conference week, meeting with Doctor Lee Phillips of Texas A and M, the Committee:

- o Finalized Module 2 from Group A.
- o Reviewed Module 1 from Group A.
- o Reviewed written reports from Groups B and E. The Committee's comments will be forwarded to those groups.
- o Received a report of progress regarding Module 23 from Group G.
- o Received a first draft of Module 26 from Texas A and M. The Committee has scheduled a trial presentation of Module 26 this fall.

At present, all Modules are progressing on schedule. The Committee wishes to express its sincere appreciation of the efforts of the working groups, without whose contributions this project would be impossible.

The Committee is pleased to report that Ed Brattle of NCR and Dan Rice of Toledo Scale have responded to the Committee's request for volunteers to assist the working groups.

J. L. Swanson, Alaska, Chairman
S. J. Darsey, Florida
T. Geiler, Hyannis, Massachusetts
P. A. Stagg, Louisiana
B. R. Niebergall, North Dakota
R. N. Smith, NBS Technical Advisor
A. D. Tholen, Executive Secretary

Committee on Education, Administration, and Consumer Affairs

REPORT OF THE COMMITTEE
ON LIAISON

Presented by KENDRICK J. SIMILA, Administrator
Weights and Measures Division, Department of Agriculture
Salem, Oregon

VOTING KEY
500

INTRODUCTION

The Committee on Liaison submits its report to the 68th National Conference on Weights and Measures (NCWM). This report consists of the tentative report as offered in the Conference Announcement and as amended by this final report. The report represents recommendations of the Committee that have been formed on the basis of written and oral comments received during the year and oral presentations made during the general meeting of the Committee.

The Chairman announced that only Item 502-6, Cash-Credit Pricing, is a voting item and that all other items are informational. The Chairman moved approval of Item 501-6. The motion carried as follows:

	<u>Yes</u>	<u>No</u>
State Representatives	39	0
Delegates	42	0

The Chairman moved adoption of the entire report with editorial privilege to the Executive Secretary. The motion carried as follows:

	<u>Yes</u>	<u>No</u>
State Representatives	42	0
Delegates	44	0

501

NBS-NCWM RELATIONSHIP

The status of the NBS Office of Weights and Measures (OWM) five-year program to improve services to State and local jurisdictions and others in the weights and measures field was reviewed by Albert Tholen, Chief, OWM. He noted that funding for FY 1983 was \$1.2 million, which is an increase of approximately \$400,000 over the prior year, and that he expected the funding to remain at that level for FY 1984 and FY 1985. He cautioned that any future funding was subject to many variables, particularly decisions by the Federal Government including the Congress.

During the current year, the OWM has arranged for support from several Centers at NBS, each for a specific task. Additionally, arrangements have been made for employment of students in cooperative work study programs. This method of "subcontracting" brings unique skills to bear

on selected tasks while retaining the flexibility to shop around for different skills as the OWM program progresses. This approach provides augmentation of present OWM staff; OWM can utilize NBS staff experts on an "as-needed" basis or hire students from a cooperative education university.

In addition, Mr. Tholen reviewed the goals and objectives as set forth in the published plan and discussed the elements of the plan's delivery mechanisms. Those mechanisms include:

1. providing the NCWM Secretariat,
2. preparation of handbooks and publications,
3. fostering and conducting training activities,
4. general servicing of requests for information or assistance,
5. support of regional and State meetings,
6. support supplied by mail and telephone.

It was noted that of the \$1.2 million funding, \$150,000 was a grant to the NCWM for development of the National Training Program. This is an addition to support of regional training and metrology seminars.

Since the interim meetings of the NCWM Standing Committees in January, President Reagan has proposed a major reorganization of the Federal Government that will eliminate as a cabinet-level agency the U.S. Department of Commerce, parent agency of the National Bureau of Standards. Under the President's plan, the National Bureau of Standards, including the Office of Product Standards Policy, together with the Office of Weights and Measures, would be transferred to the National Science Foundation. Under this arrangement, policy direction for NBS will come from the National Science Board, a 24 member committee of representatives from academia and industry appointed by the President. The Committee calls this development to the attention of the Conference because of the substantial nature of the change in the way the Bureau and its components will receive policy direction, if the Congress enacts the proposal. Depending on the priorities set by the National Science Board for the Bureau, the Committee feels the NBS-NCWM relationship could be significantly affected.

502

FEDERAL AGENCY ACTIVITIES

502-1 FEDERAL GRAIN INSPECTION SERVICE

Representatives of the Federal Grain Inspection Service (FGIS) met with the committee and presented a report covering the status of the Master Track Scale Testing Program. Present were Dick Pforr, Chief, Scale Testing and Weighing Branch and Ben Banks, Program Manager.

The purpose of the meeting was twofold, (1) to hear and discuss developments during the past 12 months in relation to the calibration

and certification of master track scales, test cars, and other railroad track scales; and (2) to discuss any problems that may have developed in the overall FGIS program.

There are approximately 5,500 railroad track scales that are tested and approved through the use of test cars operated by the railroads and by State agencies. Those test cars are calibrated by reference to a system of 15 master track scales throughout the United States. The calibration of the 15 master scales and the testing of other track scales for which FGIS is directly responsible are being done with two test cars operated by FGIS.

The two test cars operated by FGIS are to be calibrated once each year by use of the National Bureau of Standards master standard at the Clearing, Illinois, master scale facility. The NBS standard is to be recalibrated at least every five years by NBS at Gaithersburg, Maryland. In this way traceability will be maintained.

During FY 1982 with both test cars in operation Mr. Pforr and Mr. Banks reported the following activities: (1) all 15 master track scales were tested, (2) 12 test car field calibrations were conducted, (3) 21 Clearing facility car calibrations were completed, (4) 18 railroad-owned scales were tested, (5) 76 grain scales and 18 other railroad track scales were tested.

The Association of American Railroads provided financial and operational assistance to FGIS in conducting these tests.

In addition to the above tests, several requests from private industries seeking assistance in calibrating large mass standards and in testing special purpose large-capacity scales were responded to. These tests were conducted on a total cost recovery basis, giving priority to the testing of grain industry and master track scales.

During FY 1982, as a result of a request from the State of Illinois, two 2500-lb mass standards were transferred to the Illinois metrology laboratory to be used in conjunction with their new, large-capacity mass comparator.

Mr. Pforr indicated that they would review the routing of both east and west coast itineraries for FY 1983 to determine if more efficient routing can be accomplished.

There are 24 States involved in the Federal Grain Inspection Program; all but three States, Ohio, Texas, and Maine, participated in the certification of scales calibrated by FGIS in 1982. The Liaison Committee encourages all States involved to cooperate and make certain all FGIS tested devices are simultaneously certified by appropriate weights and measures officials.

The need for accuracy in railroad track scales involves many industries other than those in the grain trade. The Committee is concerned that those who employ track scales in their operations be able to receive appropriate track scale calibration and certification services.

The Committee on Liaison is encouraged by the progress report for FY 1982 given by Mr. Pforr and Mr. Banks. Their projection for FY 1983 indicates more participation in expanded areas.

502-2 NET WEIGHT--USDA/FDA

On November 30, 1982, the Liaison Committee, acting upon a recommendation in its report to the 67th Conference, submitted a recommendation to the USDA and to the FDA to consider Handbook 133 as an alternative to the agencies' net weight proposals published in 1980 but which have not been acted upon. The Committee also submitted to USDA and FDA copies of H-133 and a draft of the field manual version of the handbook for their review and evaluation.

On January 10, 1983, Donald L. Houston, Food Safety and Inspection Services, USDA responded that the publications were being studied by their technical staff. He commented that the Maximum Allowable Variations (MAV's) provided good net weight controls for meat and poultry products. However, he stated that the sampling criteria in H-133 may not be suitable when compared to their labeling proposal.

During the interim meeting in January, Dr. William Dubbert, FSIS, USDA, stated that the Department felt that their current regulations in force are adequate and satisfactory. His statements imply that they do not plan to adopt their 1980 proposal modeled after H-133 and that the Conference suggestion to their Department to consider adopting H-133 for meat and poultry will not be followed.

Because differences exist between H-133 and the USDA regulations, adoption of H-133 by the States could result in the continued exercise of concurrent jurisdiction over Federally inspected meat and poultry products. This has been illustrated in the past by the coexistence and use of the NBS Handbook 67, "Checking Prepackaged Commodities" and the USDA regulations.

On July 13, 1983, William F. Randolph, Deputy Associate Commissioner for Regulatory Affairs, FDA, sent a memorandum to the Liaison Committee to inform the Conference that it has forwarded a document for approval announcing final action on its August 8, 1980 proposed rule concerning net weight labeling requirements. The FDA expects that this document will be published in the Federal Register in approximately two to three months.

502-3 AEROSOL NET WEIGHT LABELING

Deputy Associate Commissioner William Randolph, FDA, advised the Committee that he expected proposal action to be published within a few months in the Federal Register regarding the NCWM petition pertaining to net weight labeling of aerosol packaged products. However because the agency implements proposed label changes only on very limited uniform dates and the next uniform effective date that permits the required minimum one full year advance notice to industry is July 1, 1985, publication of the proposal in May or June of this year will not result in early modification of the federal regulation. Mr. Randolph suggested that meanwhile, section 10.3 of the Model State Packaging and Labeling Regulations will require most aerosol packages to comply with the Conference position.

In their July 13, 1983 memo, the FDA stated that final action on this proposal is also pending a determination as to whether or not it is subject to the requirements of the Office of Management and Budget March 31, 1983, final rule (48 FR 13666) on controlling paperwork burdens on the public.

502-4 NET WEIGHT LABELING OF MARGARINE

On June 14, 1982, a letter of request in behalf of the Conference was sent to the FDA asking them to propose to the Congress that section 407 (b)(z) of the Food, Drug, and Cosmetic Act (21 USC 347(b)(z)) be modified to permit the sale of margarine in packages with a net weight greater than one pound. In a letter of response to the request, Howard Pippin, Chief, Guidelines and Compliance Research Branch, Bureau of Foods stated that FDA would give due consideration to the views of NCWM during their next planning sequence for legislative proposals.

At the Interim Committee Meeting, Deputy Associate Commissioner William Randolph, told the Committee that they were permitted to make only four legislative proposals in this planning sequence and this request had a lower priority than others. The Committee made known its desire that this be given due consideration at the next planning sequence.

In their July 13, 1983 memo, the FDA reiterated the fact that the Conference proposal would not be addressed this year. However, the FDA did suggest that the NCWM consider submitting their proposal directly to interested members of Congress.

It was observed during the Interim Committee Meeting with some irony that with respect to the labeling of margarine, during the short interval of time between August 1982 and December 1982, some western State jurisdictions had:

1. received angry letters from a margarine manufacturer criticizing the NCWM's request to FDA seeking repeal of the "1-lb maximum" law because it would "permit undue proliferation of package sizes";

2. found the same manufacturer to, have actually introduced and packaged more than 8000 cases (24 packages per case) of a new 12-ounce size of margarine that is not permitted under either the NCWM model regulation or any of the State laws in the States where it was being marketed;
3. found the same manufacturer's 5-lb institutional size margarine packages on sale at retail in a large regional chain's supermarket, although such sales are unlawful under the FDA administered "1-lb maximum" law.

This last observation was clearly the most ironic since the NCWM's position would have in fact removed the Federal prohibition on such sales (the NCWM and the States already recognize sales of margarine in multiples of 1 lb) while the manufacturer's own letters opposed their being able to market their product at retail in 5-lb sizes.

502-5 PRODUCTS WITH NO OR WITH INACCURATE QUANTITY STATEMENTS

The Committee met in joint session with the Committee on Laws and Regulations concerning the sale of a product (potpourri) in decorative containers with no quantity statement. The results of the session and the action proposed are reported in the Laws and Regulations Committee Tentative Report (item 207-5).

The Committee also met with representatives of USDA concerning inaccurate quantity statements on small snack-size sausages. The USDA officials expressed interest and said they would look into the problem.

502-6 CASH-CREDIT PRICING

The Liaison Committee, in joint session with the Committee on Laws and Regulations, met with Gerald Hurst from the Federal Reserve Board (FRB) and Sarah Jane Hughes of the Federal Trade Commission (FTC) in an effort to remove confusion regarding permitted practices for cash discounting of motor fuel sales under the Cash Discount Act. After hearing the background from the two officials on the often confusing published Federal Reserve Board staff commentary on Regulation Z, the L&R Committee moved as indicated in their report (item 207-1) to clarify the cash discount guidelines that were presented to the 1982 NCWM. The Liaison Committee will present the modified guidelines to the Board of Governors of the Federal Reserve System. The Board of Governors will be asked to indicate to the NCWM whether the guidelines are in conformance with the Cash Discount Act. With the belief that the Conference guidelines are more specific and understandable, and that they can better serve as a practical means of achieving the price posting aims of the Cash Discount Act in motor fuel sales, the Committee will also urge the Federal Reserve Board to recognize or incorporate provisions of the NCWM Guidelines in any further interpretations or staff commentaries published.

Upon receipt of the Interim Report of the Committee on Laws and Regulations, the Committee for Liaison, through its Chairman, wrote to the Board of Governors of the Federal Reserve System and inquired if the proposed NCWM guidelines for the cash discounting of motor fuel sales were appropriate and in accordance with the Cash Discount Act. Mr. Griffith L. Garwood, Director, Division of Consumer and Community Affairs, Board of Governors of the Federal Reserve System, responded in a letter dated June 1, 1983 that the guidelines do not conflict with the requirements of the Cash Discount Act to the extent that the Act has been interpreted by Board staff. The Committee, however, wishes to advise the members of the NCWM that the surcharge prohibition in the Cash Discount Act will expire on February 27, 1984. Any Conference member wishing to express an opinion on the expiration of the surcharge prohibition should contact: (1) U.S. Senate Banking Committee; (2) the U.S. House of Representatives Banking Committee, Subcommittee on Consumer Affairs and Coinage; and (3) the Federal Reserve Board, Consumer Affairs Department.

The Committee further recommends that the National Conference support dropping of the credit surcharge prohibition when it expires in February 1984. If this NCWM policy position is adopted, the Conference position on this issue will be conveyed to the above listed offices.

502-7 KEROSENE GRADES

The State of Maryland, through the Southern Weights and Measures Association, requested that the L & R Committee require, as a method of sale, that all kerosene kept, offered, exposed for sale, or sold be identified by ASTM designations for kerosene. The L & R Committee plans to offer to the 1983 NCWM such an amendment to the Method of Sale of Commodities Regulation for prepackaged kerosene (item 204-7). The S & T Committee has offered changes to H-44 that will require that kerosene sold through retail dispensers be appropriately identified. There appears to be no need at this time for liaison action on this matter.

503 PROMOTION OF USE AND APPLICATION OF NBS H-133

The Committee in its Final Report to the 1982 Conference supported further exposure to H-133 through NBS-sponsored field training seminars as well as preparation of a field manual and a video-tape series. Personnel from the Office of Weights and Measures conducted field training seminars on H-133 at NBS in August 1982 for industry and Federal agencies, and regional seminars in September at Snowbird, Utah, and Denver, Colorado for weights and measures officials. The seminar at Snowbird was held following the Western Conference and included participation by members of the Western Conference. The seminar in Colorado included participation by officials from Kansas and Nebraska. Regional seminars are being planned for the metropolitan New York area in Nyack in April 1983, and in Boston, Massachusetts in May.

A seminar is being considered by the Department of Commerce Bureau of Fisheries; in addition, a seminar will be held in Hawaii following the Western Conference, in Connecticut in October, and in Arkansas in April 1984.

A condensed field manual version of H-133 has been developed and used in training seminars. A third draft of the field manual is now available.

A script for the videotape training program for H-133 has been prepared by an American University student class on videotape productions as a class project. However, the script will require considerable revising by the OWM staff.

504

UPDATE OF NBS HANDBOOKS

As stated in its Organization and Procedures booklet two of the primary objectives of the National Conference on Weights and Measures are: (1) "to develop a consensus on model laws and regulations, specifications, and tolerances for weighing and measuring devices and on testing, enforcement, and administrative procedures" and (2) "to encourage and promote uniformity of requirements and methods among jurisdictions."

With this thought in mind the Liaison Committee in its report last year (1982) reviewed the extensive series of Handbooks dealing with weights and measures that are published by the National Bureau of Standards. A number of these were either no longer in print or had not been kept current (published within the past ten years) and yet all of these are widely accepted reference works by weights and measures officials. As a result the Committee recommended 15 different publications be updated, reprinted, and made available to weights and measures officials.

In response to that recommendation Mr. Albert D. Tholen, Chief of the Office of Weights and Measures, appeared before the Liaison Committee and reported as follows:

- (1) The material in most of the handbooks identified by the Liaison Committee in its report to the 67th Annual Meeting will be updated as part of the work underway in the National Training Program. A series of modules (textbooks) will be written that, collectively, will include the subject material of the existing (but out of date) handbooks. In Table 1 the publications recommended for updating are listed. The right hand column, identifies the number of the training module that will contain updated material now in the handbooks of interest (left hand column). See the report of the Committee on Education, Administration, and Consumer Affairs (item 407) for identification of modules.
- (2) All new publications, including updating of existing handbooks and manuals of the training program, will be computer based for ease of updating.

TABLE I
NBS HANDBOOKS WITH REFERENCE VALUE
TO STATE AND LOCAL WEIGHTS AND MEASURES OFFICIALS

NBS HAND- BOOK	HANDBOOK DESCRIPTION	DATE ISSUED	NCWM ADOPTED	PUBLICATION STATUS	1982 ACTION	MODULE* NUMBER(S)
H-45	Testing of Measuring Equipment	5/51	N0	In Part Superseded by H-112; H-137	Recommend Updating	8,9,17,18,19,20
H-82	Weights and Measures Administration	6/62	YES	Recommended by 46th (1961) NCWM	Recommend Updating	23,24,25
H-94	The Examination of Weighing Equipment	3/65	N0	In Part Superseded By H-112	Recommend Updating	1,2,3,4,5,6,7 11,12,13,14,15,16
H-98	Examination of Farm Milk Tanks	5/64	N0	Original Publication Never Republished	Recommend Updating	Not identified as yet
H-99	Examination of LP-Gas Liquid Measuring Devices	4/65	N0	Original Publication Never Republished	Recommend Updating	21
H-108	Weights and Measures Handbook	5/71	N0	Original Publication	Recommend Updating	General information included in all modules
H-112	Device Examination Procedure Outlines	6/73	N0	Code References Based on H-44 1972 Edition	Recommend Updating	EPDs included in all modules

* Titles of modules are in Report of the Education Committee (Item 407)

- (3) As manuals are completed, the Liaison Committee should review them to determine if the contents are in the format and detail deemed necessary as reference documents (thereby replacing outdated handbooks) or if some additional work of extraction and reformatting is necessary.
- (4) Preliminary work is underway to update NBS Circular 540, "Weights and Measures Case Reference Book."

505

TASK FORCE ON PACKAGE CONTROL

The task force, previously a subgroup to the Special Study Group on a National Weights and Measures System, now reports to the National Conference through the Committee on Liaison due to restructuring of activities within the NCWM during 1982.

The task force met twice during the interim committee meetings at the National Bureau of Standards in January, 1983. The task force also met and reported to a joint meeting of the Standing Committees on Liaison and on Laws and Regulations.

The task force has given priority during the past year to three of the recommendations referred to it by its predecessor, the NCWM Special Study Group on Enforcement Uniformity. In addition the task force has initiated activity toward identifying those concepts and elements of package control that are practical from an operational standpoint, economically feasible, and politically achievable. Reports on the three ongoing activity areas and the new work item, and their results to date follow.

ONGOING ACTIVITY I. DEVELOPMENT OF A FIELD MANUAL ON PACKAGE SAMPLING AND NET CONTENTS CHECKING PROCEDURES.

Carroll Brickenkamp, Stephen Hasko, and Mary Natrella from the National Bureau of Standards have developed a field manual version of H-133. The first draft appeared in August, 1982. A second draft was issued at the Interim Meetings of the National Conference on Weights and Measures in January, 1983.

The field manual consists of the procedures, tables, and report forms needed for field inspectors. Most of the material comes directly from H-133 and is organized in a manner that facilitates field use.

The manual consists of eight sections:

- Section I : Decision Charts - a description of the steps necessary to determine package compliance.
- Section II : Sampling Plans - tables that describe each type of sampling plan in H-133.

- Section III : Alternative Tare - procedures for determining the tare of glass, aerosol, and other variable tare packages.
- Section IV : Weighing Rules - determination of units of measure
- Section V : Maximum Allowable Variations (MAV's) - tables of allowances for individual packages.
- Section VI : Report Forms - worksheets and forms needed to record the results of an inspection.
- Section VII : Examples - completed worksheets and report forms commonly used.
- Section VIII: Random Number Tables--tables for unbiased selection of samples.

The field manual has been used in training seminars presented to industry representatives and regulatory officials on H-133. Comments received from the seminars has resulted in the incorporation of improvements in the second draft version.

The Task Force recommends that the ease of use, simplicity, organization, and completeness of the manual be evaluated under actual field conditions. The task force will undertake to do this. If further refinements are suggested, the Task Force will assist the authors to make the necessary changes in subsequent editions.

ONGOING ACTIVITY II. TRAINING NEEDS/RESOURCES FOR WEIGHTS AND MEASURES PERSONNEL INVOLVED IN PACKAGE CONTROL WORK.

The areas of need in package control training as identified by the task force were listed in and are published on pages 44 and 45 of NBS Special Publication 645, Report to the 67th NCWM. In the area of training resources, at the inception of the task force, it appeared that education and training resources and opportunities were very limited. During the past two years this perspective has changed quite rapidly.

The NBS Office of Weights and Measures has completed H-133 and is offering (see agenda item 503) training sessions on its application and use to officials and industry representatives. A videotape training series on H-133 is in process by NBS, the scripts to be developed with the assistance of American University in Washington, D.C. These will serve to provide two modules of training devoted to packaging.

The Institute for Weights and Measures, headquartered in Columbus, Ohio, at Franklin University, has developed and is offering a course in package checking. Alfred College (NY) and Butler College (IN) in the East, and Yuba and Golden West Colleges in California have for some time offered two-year courses leading to Associate degrees in weights and measures. These curricula all include some courses in or applicable to package checking, sampling, and statistical quantity control.

The Task Force believes that because of the extensive work being done in this field by the groups and organizations identified above, it has reached the end of its work on this activity unless further involvement is requested of it by others in specific areas.

ONGOING ACTIVITY III. COMPARISON AND EVALUATION OF PACKAGE CONTROL SYSTEMS USED IN OTHER COUNTRIES.

The task force has begun review and evaluation of the systems of package control used in various foreign countries in order to assess whether to recommend any elements of these systems for possible use in the U.S. A detailed comparison of some of the structural elements and features of such systems in eight other nations, plus the EEC (common market) and related work underway in the OIML and Codex organizations, was published in preliminary form on pages 46-59 of NBS Special Publication 645, Report of the 67th NCWM.

NEW WORK ACTIVITY - IDENTIFYING STEPS THAT CAN BE TAKEN TOWARD A MORE EFFECTIVE AND MORE EFFICIENT SYSTEM OF PACKAGE CONTROL IN THE U.S.

The existing system of package control in the U.S. involves a division of responsibility among the packager, various Federal authorities, and State and local weights and measures officials. Although the existing system has served us well in some respects for many years, more coordination among the various authorities would be beneficial in terms of both efficiency and effectiveness.

Moreover, developments such as the decision of the U.S. Supreme Court in the Rath case, the increasing use by packagers of high-speed packaging machinery, national distribution, and the shortage of resources to be devoted to package checking in some jurisdictions all suggest the need for mechanisms that would permit more effective coordination.

With all this in mind, the task force has developed a framework for considering some of the issues raised both by the existing, fragmented system of package control in the U.S. and by the Task Force study of other countries' systems of package control. This framework, in the form of the discussion paper that follows, includes concepts for a rationalized U.S. national package control system that incorporates a mechanism (the "I"-mark Program) for more effective coordination among local, State, and Federal jurisdictions and affected packagers.

NCWM TASK FORCE ON PACKAGE CONTROL

DISCUSSION PAPER

TOWARD A RATIONALIZED U.S. NATIONAL PACKAGE CONTROL SYSTEM

I. Starting Assumptions.

- A. Such a system is achievable with no additional Federal legislation.
- B. Changes that may be necessary can be accomplished by evolutionary means.
- C. All proposed State and local net contents requirements including the way that they are interpreted and applied, will not be inconsistent with corresponding Federal requirements.
- D. All parties involved will use their best efforts on a continuous basis to seek to simplify and unify, to the maximum extent possible, corresponding policies, procedures, and requirements.

II. Scope and Coverage Principles.

- A. Packaged products covered by this package control system include any consumer or non-consumer packages, food or non-food, subject to exclusive or concurrent jurisdiction of the States under the NCWM model laws (See Table II).

TABLE II
GOVERNMENT AGENCIES AND THEIR PACKAGE QUANTITY LABELING AND FILL RESPONSIBILITIES

CONSUMER PACKAGES							NON-CONSUMER PACKAGES				
STATE AND LOCAL WEIGHTS AND MEASURES											
	USDA	FDA	FTC	EPA	BATF		USDA	FDA	EPA	BATF	
PRODUCTS	MEAT POULTRY	FOOD DRUGS COSMETICS	NON- FOOD	HERBICIDES PESTICIDES RODENTI- CIDES	ALCOHOLIC BEVERAGES TOBACCO	OTHER SPTG GDS AUTO. CHEM HARDWARE etc	MEAT POULTRY	FOOD DRUGS COSMETICS	PESTICIDES	ALCOHOL TOBACCO ALCOHOLIC BEVERAGES	OTHER
UNITS OF MEASURE											
CUSTOMARY UNITS ONLY			<div>COVERAGE OF FPLA</div>		TOBACCO MALT BEVERAGE					TOBACCO MALT BEVERAGE	
DUAL UNITS					A					A	
METRIC UNITS ONLY	A	B	A		WINES SPIRITS ONLY		A	A		WINES SPIRITS ONLY	

A. NOT PERMITTED IN APPROPRIATE
FEDERAL AGENCY REGULATIONS

B. LIMITED TO DRUGS

- B. Government agencies (Federal, State, and local) will continue to exercise their existing respective authority to function with respect to net contents labeling. This means (See Table II) that the States will in some product areas exercise concurrent jurisdiction with a Federal agency, in other product areas exercise exclusive jurisdiction, and in some areas exercise concurrent jurisdiction with a city or county unit.

III. Package Compliance Standards.

- A. The "average concept" will apply to net content label declarations.
- B. Appropriate "unreasonable error limits" or Maximum Allowable Variations (MAV) will be established to allow for unavoidable deviations in good manufacturing practice.
- C. The package control system will have a statistical approach based on NBS H-133 as a starting point.

IV. Operating Principles.

- A. Place of Inspection. Inspections of packaged product for net content compliance can be conducted at:
 - 1. The plant or package level;
 - 2. The wholesale or warehouse level;
 - 3. The retail level or point of final sale.
- B. Time and Nature of Inspections. With due consideration for the reasonableness and frequency of such visits, any inspection under "A" can be performed on an unannounced-in-advance basis during normal business hours.
- C. Agency Corrective Action Alternatives. In cases of noncompliance, the jurisdiction involved shall, if and as authorized, employ progression enforcement actions including:
 - 1. administrative warnings;
 - 2. off-sale orders and injunctions;
 - 3. civil penalties and diversionary agreements; and
 - 4. prosecution.

Use of any of these agency corrective action alternatives would be governed by the circumstances applicable in each case.

V. Supporting Principles. (See further discussion in Section VI.)

- A. A U.S. "I"-mark Plan. A voluntary, jointly-administered NCWM-industry U.S. package control "I" (for inspection) mark program can be developed to provide that the qualifying

products of participating firms will not be subjected to official sanctions under IV.C. above, unless or until verified deviations from good manufacturing practices and, where applicable, from good distribution practices, have been shown to have occurred.

- B. Access to Inspection Records. Participants in a joint NCWM-industry "I"-mark program will agree to make available on a complete and reciprocal basis lot inspection records for any product under question; access shall be for a specific product lot.

VI. U.S. "I"-Mark Program Description.

The U.S. "I"-mark program is intended to assure weights and measures officials in other jurisdictions that the products from participating plants have been subject to an in-plant net contents compliance program which is sufficient under normal circumstances to assure that packages leaving the plant bear correct net content labeling. Some processors and packers of food products already have implemented programs. An analogous approach is the European Economic Community's "e" mark program.

The adequacy of "I"-mark net content control programs can in part be evaluated according to accepted statistical principles. To the extent that technical expertise is essential in judging the adequacy of any particular program, the NCWM could call on the National Bureau of Standards for evaluation assistance, particularly in relation to sampling plans. Other elements of a quantity control QC program would be measured against minimum "I"-mark program standards developed by the NCWM with the assistance of industry and other agencies in a manner similar to that involving H-44 and NTEP (Type Evaluation) standards. In order to keep the workload manageable for the Bureau, the "I"-mark Program could provide that QC programs could be developed for official certification by industry trade associations as well as individually by firms. After NCWM/NBS certification, firms that implement in a complete, verifiable, and documented manner either their own certified (NCWM/NBS) or their associations's certified model net content quantity control program would be able to use the "I"-mark on their qualifying products.

There is precedent for such a NCWM sponsored - NBS administered program in certification of devices being evolved under the National Type Evaluation Program. Under NTEP the Bureau will issue a "Certificate of Conformance" to type for particular devices. In addition, through NTEP NBS will authorize State measurement laboratories to act as participants in the Type Evaluation Program.

Similarly in connection with the "I"-mark Program concept, a participating model (or individual) net content quantity control

program would be certified by NBS under the auspices of the Conference. Upon implementing in a complete, verifiable, and documented manner a certified QC program, a packer or processor would be entitled to place an "I" on his product. The packer would also be entitled to expect that his product would not be held or ordered off-sale officially during its distribution, prior to a confirmed official finding that either the approved in-plant "I"-mark net quantity control program standards had been violated for the lot(s) involved, or where applicable, that good distribution practices had not been followed. It follows that the packer, as a further condition of the use of the "I"-mark agrees to make the records of net content fill control and all in-plant QC checking on specific questioned lots available for prompt review. Also, packers would have to allow site visits by inspection officials, or their designees, to the plant during business hours if reasonably necessary to review records and procedures or to confirm the operation of the approved net content quantity control program.

It is anticipated that within a reasonable period of time after development and implementation of an acceptable U.S. NCWM/NBS "I"-mark program, most U.S. packed and nationally distributed food commodities would be eligible for the "I" mark. Non-food commodities would possibly lag behind. Inspection procedures for products that gain or lose moisture and that are currently entitled to an allowance for that factor under Federal law would be the same as exist for those products now. The incentive for industry to qualify for the "I"-mark is that the program would provide greater confidence and uniformity in government inspection efforts. The payback to the jurisdictions would be for the most part the ability to use scarce resources in other areas, rather than duplicating efforts of others. Certainly a beneficial outcome for all would be the increased efficiency and effectiveness that would stem from greater coordination of parallel efforts between the various authorities.

The task force plans to continue to refine the above outlined and described package control system principles, concepts, and elements and is not prepared to offer a definitive draft program plan for Conference consideration at this time. However, the task force seeks and welcomes comments from all interested persons.

NCWM TASK FORCE ON PACKAGE CONTROL

A. Johanson, Foremost McKesson, Inc., Co-chairman
K. Simila, Oregon, Co-chairman
J. Alloway, Nebraska
R. Belliveau, Proctor & Gamble Co.
C. Kloos, Hunt Wesson Foods, Inc.
D. Offner, St. Louis, MO
N. Peterson, General Mills
D. Stagg, Alabama

Mr. David Edgerly, U.S. Representative to the International Organization of Legal Metrology, met with the Committee to provide an update of OIML activities during the past year. He reported that U.S. participation in OIML remains strong, particularly in the basic areas of mass, length, and volume. Continuing emphasis is being given in OIML to developing international recommendations on electronic-equipped weighing and measuring instruments. Further, work is now underway in developing recommendations dealing with prepackaged products, and Mr. Edgerly indicated his pleasure over the nomination of Mr. Ken Simila as NCWM representative to the multi-agency U.S. Working Group that has been assembled to chair this work in OIML. Mr. Edgerly also reported that the process set up by NCWM to provide input to OIML activities of interest to the Conference is still working well and that no changes are needed to improve the process.

507-1 COMMITTEE ON EDUCATION, ADMINISTRATION, AND CONSUMER AFFAIRS

Co-Chairmen of National Weights and Measures Week, Bruce Niebergall, North Dakota, and Peggy Adams, Bucks County, Pennsylvania, reported that a kit of information which included press releases, public service announcements, school programs, and promotional ideas was mailed to coordinators of National Weights and Measures Week in all jurisdictions and to State Directors. A Presidential Proclamation is being pursued through a Congressional resolution. In March, President Reagan sent a letter to the National Conference on Weights and Measures supportive of weights and measures activities, which is printed in the Announcement Book. A slide show depicting all weights and measures activities with an accompanying narrative is being completed and will be duplicated by the Office of Weights and Measures for distribution.

507-2 COMMITTEE ON LAWS AND REGULATIONS

A substantial portion of the output of the National Conference on Weights and Measures originates from the work of the Standing Committee on Laws and Regulations. Their deliberations and recommendations are the basis on which the Conference acts to adopt or update its numerous Model State Weights and Measures Law and Regulation provisions. While adoption in whole or in part of these models by States and local jurisdictions goes a long way toward achieving the aim of uniformity, independent action by the Congress, Federal agencies, and other standards-writing bodies can and sometimes does frustrate this aim. These conflicts (direct or indirect) and inconsistencies (real or perceived) give rise to liaison needs such as are exemplified in preceding items 502-2, -3, -4, -5, -6, and -7. The Committee on Liaison continues to work closely in conjunction with the Laws and Regulations Committee as pertinent agenda items evolve, to be in a

position to effectively "market" NCWM "products" (positions and models) to outside organizations, especially to Federal agencies whose legal metrology responsibilities are frequently only peripheral or incidental to some other focus.

507-3 COMMITTEE ON SPECIFICATIONS AND TOLERANCES

There did not appear to be any liaison items or problems in the Committee on Specifications and Tolerances agenda or sessions.

508 FUTURE WORK ITEMS

508-1 NET WEIGHT RELATED MOISTURE VARIATIONS

Phase I - How to deal with the problem of State and local officials different perceptions and understandings of moisture variation realities:

1. They exist
2. Actual treatment
3. Legal requirements

Phase II - How to involve industry (and weights and measures jurisdictions) in supplying or providing "real world" data on moisture variations in products as currently packaged and distributed.

508-2 CONSUMER COMPLAINT HANDLING

The U.S. Office of Consumer Affairs is planning to present a training session that would deal with establishing and utilizing mechanisms for consumer complaint handling in State and local offices and in weights and measures related business and industry. It is hoped that this will be presented at the Southern Weights and Measures Conference in October.

508-3 INTERAGENCY INTERACTIVE ELECTRONIC COMMUNICATIONS

An emerging concern for the decade of the 1980's and beyond has been how to effectively use and manage interactive electronic communications capabilities now available in order to meet the data and information transfer needs of all local, State, and Federal agencies involved in U.S. legal metrology activities. Some of the questions that need to be addressed in this broad subject area include:

1. What are the needs and benefits?
2. What are the existing technologies that can be implemented?
3. What roles should be assumed by:
 - A. The National Conference on Weights and Measures
 - B. The National Bureau of Standards and OWM
 - C. State and local governments
 - D. Other Federal Agencies with a liaison relationship to the NCWM

K. J. Simila, Oregon, Chairman
C. R. Cavagnaro, U.S. Office of Consumer Affairs
C. R. Kloos, Hunt-Wesson Foods, Inc.
N. D. Smith, North Carolina
E. J. Stephens, Utah
S. Hasko, Technical Advisor, NBS
A. D. Tholen, Executive Secretary, NCWM

COMMITTEE ON LIAISON

REPORT OF THE RESOLUTIONS COMMITTEE

Presented by John O'Neill, Acting Chairman
Sealer, State of Kansas

VOTING KEY

700

INTRODUCTION

The Resolutions Committee wishes to express the appreciation of the 68th National Conference on Weights and Measures to those who contributed their time and talents toward the arrangements for, the conduct of, and the success of this National Conference. Special votes of thanks go

701

- 1) To Dr. Ernest Ambler, Director of the National Bureau of Standards, for his appropriate and straight-forward remarks.
- 2) To Honorable Clare Berryhill, Director of Food and Agriculture, State of California, for his warm and timely remarks, and to his staff for hosting and assisting in the conduct of this Conference.
- 3) To Donald L. Peyton, Executive Vice President, American National Standards Institute, for his discussion on the role of ANSI.
- 4) To Paul Allen, Chairman Trading Standards Department, East Sussex County Council, England, for his comparative report.
- 5) To Albert D. Tholen, Office of Weights and Measures, National Bureau of Standards for his informative remarks on the program of the Office of Weights and Measures - National Conference on Weights and Measures joint activities.
- 6) To Randall Schoonover, Physical Science Technician, National Bureau of Standards, for his highly technical and investigative report on mass comparisons.
- 7) To James W. Williams, Brooks Instrument Division, Emerson Electric Company, for informing us regarding updated volume measurement science applications.
- 8) To officers and appointed officials of the 68th National Conference on Weights and Measures for their assistance and service toward progress on National issues.
- 9) To committee members for their efforts throughout the past year preparing and presenting their reports; to the sub-committees of the Executive Committee for their discerning and appropriate recommendations of reorganization.

- 10) To governing officials of State and local jurisdictions for their advice, interest, and support in weights and measures administration in the United States; to Ezio Delfino and his staff.
- 11) To representatives of business and industry for their cooperation, assistance in committee and Conference work; to the Associate Membership organization for its hosting functions.
- 12) To the staff of Red Lion Motor Inn for their assistance and courtesies, which contributed to the enjoyment and comfort of the delegates in their fine facilities.
- 13) To the National Bureau of Standards and the Office of Weights and Measures for their outstanding assistance in planning and conducting the work and program of the National Conference on Weights and Measures.
- 14) To Office of Weights and Measures staff:

Ann Heffernan, Conference Coordinator
Karen Barkley
Dawn Alger
Nancy Chapwick

To Guest Program staff:

Claire Delfino
Lynn Guensler
Irene Warnlof

To Sacramento Measurement Standards staff:

Barbara Bloch
Carol Ramsey
Linda Simmons
Chris Estes
Jean Tabor

for ever-present support and hard work for the Conference and its delegates.

John O'Neill, Kansas, Acting Chairman
Thomas Kirby, Georgia
Samuel Valtri, Philadelphia, PA
Robert Voss, Fresno County, CA
Lawrence Barker, West Virginia
Dean Brahos, Hammond, IN
Norman Ross, Omaha, NE

(On motions of the Committee Acting Chairman the report of the Resolutions Committee, voting key item 701, was adopted in its entirety by the Conference.)

FINAL REPORT OF THE NOMINATIONS COMMITTEE

Presented by Charles H. Greene, Conference Chairman,
for Edward C. Heffron, Committee Chairman

VOTING KEY
800

INTRODUCTION

The Nominations Committee convened at the interim meeting at Gaithersburg, Maryland to select a slate of nominees for all elective officers and for the ten elective members of the Executive Committee in accordance with the existing procedure. The Nominations Committee convened again at the National Conference to select a slate of nominees for all elective officers and the six elective members of the Executive Committee as required by the adoption at the 68th Conference of voting item 102-5-2 "Implementation of Restructuring" in conjunction with the adoption of voting item 102-5-1 "Executive Committee Structure."

In the selection of nominees from the active membership, consideration was given to professional experience, qualification of individuals, attendance, Conference participation, and other factors considered to be important. Adoption of item 102-5-1 at this Conference directed the Committee so far as practicable to consider regional representation. Therefore the Nominations Committee modified its interim meeting selections to conform with the directive recognizing a need also to provide continuity during this transitional period.

801 NOMINATIONS

The Nominations Committee submits the following names in nomination for office to serve during the terms for which elected beginning at the close of the 68th National Conference on Weights and Measures:

Chairman:

Sam Hindsman, Arkansas

Chairman elect:

Ezio Delfino, California

Vice Chairman:

John Bartfai, New York

Barbara Boddicker, South Dakota

Lacy DeGrange, Maryland

Joseph Swanson, Alaska

Treasurer:

Allan Nelson, Connecticut

Chaplain:

Francis Daniels, Wayne County, Indiana

Executive Committee:

Three-year term

James Blackwood, City of Dallas, TX

Robert Walker, Indiana

Two-year term

Norman Ross, City of Omaha, NE
Lyman Holloway, Idaho

One-year term

Eugene Keeley, Delaware
Edward Heffron, Michigan

To avoid conflict of interest this report is submitted by the
Conference Chairman, Dr. Charles Greene.

Edward C. Heffron, Michigan, Chairman
Sidney D. Andrews, Florida
James T. Lyles, Virginia
Wesley R. Mossberg, Los Angeles, California
Daniel I. Offner, St. Louis, Missouri
Kendrick J. Simila, Oregon
Richard L. Thompson, Maryland

REPORT OF THE AUDITING COMMITTEE

Presented by Joseph Silvestro, Superintendent
Gloucester County Weights and Measures
Woodbury, New Jersey

VOTING KEY

900

The Auditing Committee met on Wednesday morning, July 20, for the purpose of reviewing the financial records of the Conference Treasurer, Mr. Allan M. Nelson. The Committee finds these records to be in accordance with Conference procedure and correct.

J. Silvestro, Gloucester County, NJ, Chairman

N. Ross, Omaha, Nebraska

G. Magnuson, Washington

AUDITING COMMITTEE

REPORT OF THE CONFERENCE TREASURER

Presented by Allan M. Nelson, Chief
Weights and Measures Division
Department of Consumer Protection
State of Connecticut

VOTING KEY

1000

INTRODUCTION

It is my pleasure to report to you on the financial status of the Conference Treasury as follows:

Cash on Hand - June 30 1982 \$ 45,885.71

DEPOSITORIES

Connecticut Bank & Trust Co., Southington, CT	\$ 6,805.41
\$40,000.00 91 Day Treasury Bill -	
Connecticut Bank & Trust Co., Southington, CT	38,766.06
Union Trust Co., Gaithersburg, MD	<u>314.24</u>

\$ 45,885.71

RECEIPTS

Account Number	1.1 Registration-67th Conference	\$11,950.00
"	" 1.1 Registration-68th Conference	1,500.00
"	" 1.1 Special California	
	Registration	60.00
"	" 1.2 Membership - F. Y. 67	15,610.00
"	" 1.2 Membership - F. Y. 68	25,550.00
"	" 1.3 Publications	2,653.46
"	" 1.4 Interest	3,669.29
"	" 1.5 Grant	37,101.00
"	" 1.9 Miscellaneous	<u>282.70</u>

Total Receipts \$ 98,376.45

Total Cash Balance & Receipts \$ 144,262.16

DISBURSEMENTS

Account Number	2.0 Annual Meeting	\$ 9,323.42
" "	3.0 Interim Meeting	19,388.34
" "	4.0 Grant	-0-
" "	5.0 Special Program	13,339.31
" "	6.0 Chairman's Expenses	3,079.84
" "	7.0 Membership	5,664.82
" "	8.0 Printing & Publications	3,000.00
" "	9.0 Administration	<u>12,623.43</u>

Total Disbursements \$ 66,419.16

Cash on Hand - June 30, 1983

N.O.W. Account \$ 3,913.21
Connecticut Bank & Trust Co.
Southington, CT

Money Market Check Book Account 73,615.55
Connecticut Bank & Trust Co.
Southington, CT

Checking Account 314.24
Union Trust Co.
Gaithersburg, MD

Total Assets \$ 77,843.00

Total Disbursement & Assets \$144,262.16

(signed) Allan M. Nelson, Treasurer

(On motion of Mr. Nelson, the report of the Conference Treasurer, voting key item 1000, was adopted by the Conference.)

REFERENCES

Organization, 68th NCWM

NCWM Scheduled Events, 68th Annual Meeting

State Representatives

Conference Registration List

NATIONAL CONFERENCE ON

ASSOCIATE MEMBERSHIP COMMITTEE

CHAIRMAN: R. WELLS, SERAPHIN
 VICE-CHAIRMAN: R. SOUTHERS, API
 TREASURER: T. STABLER, TOLEDO SCALE
 MEMBERS: R. FONGER, BENNETT PUMP
 C. KLOOS, HUNT-WESSON
 A. KROLL, GILBARCO
 W. KUPPER, METTLER
 A. JOHANSON, FOREMOST-MCKESSON
 A. RHOADS, MILK & ICE CREAM ASSN.
 N. PETERSON, GENERAL MILLS

NATIONAL BUREAU OF STANDARDS

PRESIDENT: E. AMBLER
 EXECUTIVE SECRETARY: A. THOLEN
 CONFERENCE COORDINATOR: A. HEFFERNAN

TASK FORCE ON NATIONAL TYPE EVALUATION

CHAIRMAN: E. DELFINO, CA
 SECRETARY: A. THOLEN, NBS

POLICY WORKING GROUP

CHAIRMAN: G. MATTIMOE, HI
 J. BARTFAI, NY
 C. PARENT, GILBARCO
 N.D. SMITH, NC
 D. TONINI, SMA
 A. FARRAR, NBS*

NATIONAL MEASUREMENT POLICY AND COORDINATION COMMITTEE

CHAIRMAN: C. GREENE, NM*

SECRETARY: A. THOLEN, NBS

MEMBERS: J. BARTFAI, NY
 L. DEGRANGE, MD
 J. SWANSON, AK
 K. SIMILA, OR

SPECIFICATIONS & TOLERANCES COMMITTEE

CHAIRMAN: L. DEGRANGE, MD (1)
 MEMBERS: S. COLBROOK, IL (2)
 F. GERK, NM (4)
 D. GUENSLER, CA (3)
 R. PROBST, WI (5)

TECHNICAL ADVISOR: O. WARNLOF, NBS

LAWS & REGULATIONS COMMITTEE

CHAIRMAN: J. BARTFAI, NY (1)
 MEMBERS: G. MATTIMOE, HI (5)
 W. MOSSBERG, CA (2)
 E. SKLUZACEK, MN (3)
 D. STAGG, AL (4)

TECHNICAL ADVISOR: C. BRICKENKAMP, NBS

TECHNICAL COMMITTEE ON NATIONAL TYPE EVALUATION

PUBLIC MEMBERS

R. ANDERSON, NY
 L. DEGRANGE, MD
 F. NAGELE, MI
 C. SMITH, CA
 D. MAHONEY, FGIS
 C. OAKLEY, P&S
 O. WARNLOF, NBS
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KEY:
*Elected
*Ex-officio
*Non-voting

Published: March 1983

NCWM SCHEDULED EVENTS 68th ANNUAL MEETING

	SUNDAY	MONDAY	TUESDAY
7 a.m.			
8 a.m.		ORIENTATION SESSION FOR MEMBERS	TASK FORCE ON PACKAGE CONTROL
9 a.m.			LIAISON COMMITTEE SESSION
10 a.m.		SPECIFICATION AND TOLERANCES COMMITTEE SESSION	INDUSTRY COMMITTEE ON PACKAGING AND LABELING
11 a.m.			JOINT EXECUTIVE COMMITTEE AND P & C COMMITTEE SESSION
Noon		LUNCH (OPEN)	LUNCH (OPEN)
1 p.m.			
2 p.m.	JOINT EXECUTIVE COMMITTEE AND P & C COMMITTEE AGENDA REVIEW		GENERAL SESSION
3 p.m.	STANDING COMMITTEES AGENDA REVIEWS	LAWS AND REGULATIONS COMMITTEE SESSION	<ul style="list-style-type: none"> • OPENING CEREMONY • ADDRESS—GOVERNOR DEUKMEJIAN • ADDRESS—CONFERENCE CHAIRMAN • ADDRESS—CONFERENCE PRESIDENT • HONOR AWARDS PRESENTATION • ADDRESS—DONALD PEYTON • ADDRESS—PAUL ALLEN • REPORT—CHIEF, OWM • PAPER—RANDALL SCHOONOVER • PAPER—JAMES W. WILLIAMS
4 p.m.	L & R CTE		
	LIAISON CTE		
	EDUCATION CTE		
	S & T CTE		
5 p.m.	NASDA WEIGHTS AND MEASURES DIVISION	EDUCATION COMMITTEE SESSION	ASSOCIATE MEMBERSHIP COMMITTEE
6 p.m.			
7 p.m.	CHAIRMAN'S RECEPTION	OPEN	OPEN
8 p.m.			
9 p.m.			

WEDNESDAY				THURSDAY	FRIDAY	
BREAKFAST MEETINGS						7 a.m.
NOMINATING CTE	AUDITING CTE	CREDENTIALS CTE	RESOLUTIONS CTE			8 a.m.
REGIONAL ASSOCIATION SESSIONS				VOTING SESSION* (CONTINUED) 5 • NOMINATING COMMITTEE 6 • LAWS & REGULATIONS COMMITTEE 7 • LIAISON COMMITTEE 8 • RESOLUTIONS COMMITTEE 9 • AUDITING COMMITTEE 10 • TREASURER'S REPORT • CLOSING CEREMONY	BREAKFAST MEETING EXECUTIVE COMMITTEE AND OFFICERS	9 a.m.
NORTHEAST	NORTHWEST	SOUTHERN	WESTERN		STANDING COMMITTEES— PLANNING	10 a.m.
METROLOGY WORKSHOP II					SPECIAL COMMITTEES AND TASK FORCES— PLANNING	11 a.m.
TASK FORCE ON PACKAGE CONTROL				LUNCH (OPEN)		Noon
VOTING SESSION* 1 • VOTING PROCEDURE 2 • EDUCATION COMMITTEE 3 • JOINT EXECUTIVE/P & C COMMITTEES 4 • SPECIFICATIONS AND TOLERANCES COMMITTEE				CONFERENCE OUTING LAKE TAHOE		1 p.m.
ASSOCIATE MEMBERSHIP FUNCTION					ABBREVIATIONS KEY: • P&C = National Measurement Policy and Coordination Committee • S&T = Specifications and Tolerances Committee • L&R = Laws and Regulations Committee • EDUCATION = Education, Administration, and Consumer Affairs Committee • LIAISON = Liaison Committee NASDA = National Association of State Departments of Agriculture NCWM = National Conference on Weights and Measures	2 p.m.
						3 p.m.
						4 p.m.
						5 p.m.
						6 p.m.
						7 p.m.
						8 p.m.
						9 p.m.

*At the two voting sessions the listed items will be voted in the order shown; time availability will determine whether the Wednesday voting session closes at, after, or before item 4.

STATE REPRESENTATIVES

The following is a list of designated State representatives who were present and voting on the reports presented by the Conference standing and annual committees.

<u>State</u>	<u>Representative</u>	<u>Alternate</u>
1. Alabama	Don E. Staggs	John B. Rabb
2. Alaska	Joe Swanson	
3. Arizona	Patricia M. Fullinwider	Roger L. Macey
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7. Connecticut	Allan M. Nelson	Bryant Pearson
8. Delaware	Eugene Keeley	
9. District of Columbia	-----	
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11. Georgia	Thomas Kirby	S. S. Abercrombie
12. Hawaii	George E. Mattimoe	C. Gerald Bockus
13. Idaho	Lyman Holloway	
14. Illinois	Sidney A. Colbrook	Wayne Behms
15. Indiana	Robert W. Walker	
16. Iowa	James M. O'Connor	Robert E. Hollis
17. Kansas	John L. O'Neill	Donald Lynch
18. Kentucky	Charles Prebble	Mark L. Whitaker
19. Louisiana	Phil Staggs	
20. Maine	-----	
21. Maryland	Richard L. Thompson	Lacy H. DeGrange
22. Massachusetts	Charles H. Carroll	
23. Michigan	Edward C. Heffron	Frank Nagele
24. Minnesota	Edward Skluzacek	George MacDonald
25. Mississippi	James H. Spencer	
26. Missouri	Leslie M. Greiner	
27. Montana	Gary Delano	Edgar L. Kelsh
28. Nebraska	Steve Malone	
29. Nevada	Walter F. Headrick	
30. New Hampshire	Michael Grenier	
31. New Jersey	Thomas W. Kelly	Joseph Silvestro
32. New Mexico	Fred A. Gerk	Charles H. Greene
33. New York	John J. Bartfai	Ross Andersen
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35. North Dakota	Bruce Niebergall	
36. Ohio	Anthony Logan	Fred Clem
37. Oklahoma	George M. Parker	O. Ray Elliott
38. Oregon	Kendrick J. Simila	James Clifford
39. Pennsylvania	Fred A. Thomas	Peggy Adams
40. Puerto Rico	Maria Maldonada	
41. Rhode Island	-----	
42. South Carolina	John V. Pugh	
43. South Dakota	Barbara K. Boddicker	Leonard Bies
44. Tennessee	Robert Williams	
45. Texas	Charles Forester	Herbie Eskew
46. Utah	Dan Mays	
47. Vermont	Trafford F. Brink	
48. Virginia	James F. Lyles	Oscar T. Almarode
49. Virgin Islands	-----	
50. Washington	Gunnar N. Magnuson	Gil Allen
51. West Virginia	Kenneth S. Butcher	
52. Wisconsin	Robert Probst	
53. Wyoming	-----	

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68TH NATIONAL CONFERENCE ON WEIGHTS AND MEASURES

JULY 17-22, 1983

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