NATIONAL BUREAU OF STANDARDS

NBS SPECIAL PUBLICATION 517

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

Report of the 62nd National Conference on Weights and Measures 1977

NATIONAL CONFERENCE ON WEIGHTS AND MEASURES
THAT EQUITY MAY PREVAIL

NATIONAL BUREAU OF STANDARDS

The National Bureau of Standards[1] was established by an act of Congress March 3, 1901. The Bureau's overall goal is to strengthen and advance the Nation's science and technology and facilitate their effective application for public benefit. To this end, the Bureau conducts research and provides: (1) a basis for the Nation's physical measurement system, (2) scientific and technological services for industry and government, (3) a technical basis for equity in trade, and (4) technical services to promote public safety. The Bureau's technical work is performed by the National Measurement Laboratory, the National Engineering Laboratory, and the Institute for Computer Sciences and Technology.

THE NATIONAL MEASUREMENT LABORATORY provides the national system of physical and chemical and materials measurement; coordinates the system with measurement systems of other nations and furnishes essential services leading to accurate and uniform physical and chemical measurement throughout the Nation's scientific community, industry, and commerce; conducts materials research leading to improved methods of measurement, standards, and data on the properties of materials needed by industry, commerce, educational institutions, and Government; provides advisory and research services to other Government Agencies; develops, produces, and distributes Standard Reference Materials; and provides calibration services. The Laboratory consists of the following centers:

Absolute Physical Quantities[2] — Radiation Research — Thermodynamics and Molecular Science — Analytical Chemistry — Materials Science.

THE NATIONAL ENGINEERING LABORATORY provides technology and technical services to users in the public and private sectors to address national needs and to solve national problems in the public interest; conducts research in engineering and applied science in support of objectives in these efforts; builds and maintains competence in the necessary disciplines required to carry out this research and technical service; develops engineering data and measurement capabilities; provides engineering measurement traceability services; develops test methods and proposes engineering standards and code changes; develops and proposes new engineering practices; and develops and improves mechanisms to transfer results of its research to the utlimate user. The Laboratory consists of the following centers:

Applied Mathematics — Electronics and Electrical Engineering[2] — Mechanical Engineering and Process Technology[2] — Building Technology — Fire Research — Consumer Product Technology — Field Methods.

THE INSTITUTE FOR COMPUTER SCIENCES AND TECHNOLOGY conducts research and provides scientific and technical services to aid Federal Agencies in the selection, acquisition, application, and use of computer technology to improve effectiveness and economy in Government operations in accordance with Public Law 89-306 (40 U.S.C. 759), relevant Executive Orders, and other directives; carries out this mission by managing the Federal Information Processing Standards Program, developing Federal ADP standards guidelines, and managing Federal participation in ADP voluntary standardization activities; provides scientific and technological advisory services and assistance to Federal Agencies; and provides the technical foundation for computer-related policies of the Federal Government. The Institute consists of the following divisions:

Systems and Software — Computer Systems Engineering — Information Technology.

[1]Headquarters and Laboratories at Gaithersburg, Maryland, unless otherwise noted; mailing address Washington,D.C. 20234.
[2]Some divisions within the center are located at Boulder, Colorado, 80303.

The National Bureau of Standards was reorganized, effective April 9, 1978.

Report of the

62nd National Conference on Weights and Measures 1977

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
Dallas, Texas, July 17-22, 1977

Report Editor: Harold F. Wollin

United States Department of Commerce
Juanita M. Kreps, ***Secretary***

National Bureau of Standards
Ernest Ambler, ***Director***

Nat. Bur. Stand. (U.S.), Spec. Publ. 517, 303 pages (August 1978)
Issued (August 1978)

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402 – Price $4.25

Stock Number 003-003-01966-1

Abstract

This is a report of the proceedings (edited) of the Sixty-Second National Conference on Weights and Measures, sponsored by the National Bureau of Standards, held in Dallas, Texas, July 17-22, 1977, and attended by State, county, and city weights and measures officials, the Federal Government, business, industry, and consumer organizations.

Major issues discussed at this Conference included metric conversion in the United States; problems relating to the quantity fill, labeling, and inspection of packaged commodities; requirements covering the design and performance of new weighing and measuring technology; and recommendations for improvement in weights and measures administration.

Key words: Consumer affairs; education; electronic devices; enforcement; Grain Standards Act; International Organization of Legal Metrology; labeling insulation and polyethylene products; metrication; model laws and regulations; national type approval; specifications and tolerances; vapor recovery; weights and measures.

Library of Congress Catalog Card No. 26-27766

CONTENTS

(Note: The reports of the standing and annual committees and the treasurer's report, which were presented on Wednesday and Thursday, have been arranged together, beginning on page 140 for easier reference.)

AFTERNOON SESSION—TUESDAY, JULY 19, 1977

MORNING SESSION—WEDNESDAY, JULY 20, 1977

AFTERNOON SESSION—WEDNESDAY, JULY 20, 1977

(The presentation of Committee Reports commenced on Wednesday afternoon and continued through the afternoon session on Thursday.)

REPORTS OF STANDING COMMITTEES

REPORTS OF THE ANNUAL COMMITTEES

OFFICERS OF THE CONFERENCE

President: Ernest Ambler, Acting Director, National Bureau of Standards

Executive Secretary: H. F. Wollin, Chief, Office of Weights and Measures, National Bureau of Standards

Chairperson: Earl Prideaux, Chief, Weights and Measures Section, Division of Inspection and Consumer Services, Department of Agriculture, State of Colorado

Vice Chairpersons:

T. F. Brink, Director, Division of Weights and Measures, Department of Agriculture, State of Vermont

G. E. Mattimoe, Deputy Director, Division of Weights and Measures, Department of Agriculture, State of Hawaii

K. J. Simila, Administrator, Weights and Measures Division, Department of Agriculture, State of Oregon

R. T. Williams, Director of Programs, Department of Agriculture, State of Texas

Treasurer: James H. Akey, Sealer, Weights and Measures, Wausau, Wisconsin

Chaplain: John H. Lewis, Chief, Weights and Measures Section, Dairy and Food Division, Department of Agriculture, State of Washington

EXECUTIVE COMMITTEE

H. W. Chandler
J. M. Chohamin
S. J. Darsey
L. D. Draghetti
R. C. Egnew
L. D. Holloway
V. L. Lowe
D. L. Lynch
C. W. Moore
H. D. Robinson

(All officers of the Conference are, ex officio, members of the Executive Committee.)

APPOINTED OFFICIALS

Sergeants at Arms:

S. D. Smith, Supervisor, Metrology Laboratories, State of Texas

O. T. Almarode, Field Supervisor, Weights and Measures Section, Department of Agriculture, State of Virginia

Parliamentarian:

D. L. Griffith, Director, Consumer Protection Division, Department of Labor, State of West Virginia

(Officers and Executive Committee members elected by the 62nd National Conference to serve the 63rd National Conference on Weights and Measures will be found in the report of the Committee on Nominations, page 256.)

STANDING COMMITTEES

The number of years each committee member has remaining to serve on the committee as of the 62nd Conference is shown in parentheses. Also noted are the new appointees and newly designated committee chairpersons.

NATIONAL MEASUREMENT POLICY AND COORDINATION

S. D. Andrews, Florida, Chairperson
W. E. Czaia, Minnesota
C. H. Vincent, Dallas, Texas
W. B. Harper, Birmingham, Alabama
E. H. Stadolnik, Massachusetts

(The members of this committee consist of the presiding chairpersons of the other four standing committees and a fifth member, who serves as the committee chairperson, who is appointed annually from a list of former Conference chairpersons who are still active in weights and measures. Mr. Richard L. Thompson, State of Maryland, was appointed as Chairperson.)

SPECIFICATIONS AND TOLERANCES

W. E. Czaia, Minnesota, Chairperson
J. R. Bird, New Jersey (2)
G. L. Delano, Montana (4)
M. L. Kinlaw, North Carolina (1)
C. Wooten, Florida (3)

(J. Clair Boyd, State of Iowa, was appointed for a five-year term to replace W. E. Czaia, whose term expired. D. Guensler, State of California, was appointed for a three-year term to replace C. Wooten, who retired from his job with the State of Florida. Mr. Kinlaw replaced Mr. Czaia as Chairperson.)

LAWS AND REGULATIONS

C. H. Vincent, Dallas, Texas, Chairperson (1)
J. T. Bennett, Connecticut (2)
J. L. O'Neill, Kansas
R. W. Probst, Wisconsin (3)
D. I. Offner, St. Louis, Missouri (4)

(S. F. Hindsman, State of Arkansas, was appointed for a five-year term to replace J. L. O'Neill, whose term expired. Mr. Bennett replaced Mr. Vincent as Chairperson.)

EDUCATION, ADMINISTRATION, AND CONSUMER AFFAIRS

W. B. Harper, Birmingham, Alabama, Chairperson (1)
W. H. Korth, Ventura County, California (2)
A. J. Ladd, Akron, Ohio (3)
S. Malone, Nebraska (4)
S. Valtri, Philadelphia, Pennsylvania

(R. W. Walker, State of Indiana, was appointed for a five-year term to replace S. F. Valtri, whose term expired. Mr. Korth replaced Mr. Harper as Chairperson.)

LIAISON WITH THE FEDERAL GOVERNMENT

E. H. Stadolnik, Massachusetts, Chairperson (1)
C. H. Greene, New Mexico (3)
O. D. Mullinax, Georgia (4)
C. W. Silver, Revere Corporation of America (2)
J. Speer, Milk Industry Foundation

(M. S. Thompson, Attorney for Chadwell, Kayser, Ruggles, McGee and Hastings, was appointed for a five-year term to replace J. F. Speer, whose term expired. Ms. J. S. Wilson, President of Federal-State Reports, Inc., was appointed for a two-year term to replace Mr. Silver, who resigned from the Committee. Mr. Stadolnik continues as Chairperson.)

ANNUAL COMMITTEES

Nominations: R. L. Thompson, Maryland, Chairperson; S. D. Andrews, Florida; J. C. Boyd, Iowa; G. L. Johnson, Kentucky; J. H. Lewis, Washington; D. I. Offner, St. Louis, Missouri; E. Whitesides, Texas.

Resolutions: T. E. Kirby, Georgia, Chairperson; J. C. Blackwood, Dallas, Texas; F. W. Daniels, Wayne County, Indiana; E. F. Delfino, California; A. Fenger, Minnesota; W. McMurray, Tippecanoe County, Indiana; J. J. White, New York City, New York.

Auditing: K. R. Adcock, Ohio, Chairperson; G. J. Tommasi, Middletown, Connecticut; D. Weick, Topeka, Kansas.

Associate Membership: R. R. Wells, Seraphin Test Measure Company, Chairperson; R. H. Dougherty, National Canners Association; W. F. Gerdom, Tokheim Corporation; R. J. Lloyd, Scale Manufacturers Association; R. W. Miller, Jr., Jewel Companies, Inc., R. Southers, American Petroleum Institute; T. M. Stabler, Toledo Scale Company; M. S. Thompson, Chadwell, Kayser, Ruggles, McGee & Hastings; E. E. Wolski, Colgate-Palmolive Company.

REGISTRATIONS

Susan Blackwood, Karen Gilliam, Carolyn Hooker, Gail Lennon, Deborah Neal, Patricia Raschella

LADIES' ARRANGEMENTS

Mrs. H. F. Wollin
Mrs. O. K. Warnlof

METROLOGY WORKSHOPS

There were two metrologists' workshops scheduled during Conference week. The purpose of these workshops was primarily to train State and local metrologists in laboratory calibration procedures and techniques.

MANUFACTURERS' EQUIPMENT AND PRODUCT DISPLAY

An informal display of new equipment and products by manufacturers and suppliers was held on Monday afternoon from 4:00 to 7:00 p.m. for the education of the Conference delegates.

MONDAY, JULY 18, 1977
and
TUESDAY, JULY 19, 1977

OPEN COMMITTEE HEARINGS

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

REPORT OF THE SIXTY-SECOND NATIONAL CONFERENCE ON WEIGHTS AND MEASURES

MORNING SESSION—MONDAY, JULY 18, 1977

(Earl Prideaux, *Chairperson*, Presiding)

Mr. J. H. Lewis, Washington, the Conference Chaplain, delivered the invocation and led the delegates in the Pledge of Allegiance.

GRAIN WEIGHING UNDER THE U.S. GRAIN STANDARDS ACT

Presented by Dr. Leland Bartelt, Administrator, Federal Grain Inspection Service, U. S. Department of Agriculture

I'm very enthusiastic about getting into a discussion of the grain weighing aspects of the Committee on Specifications and Tolerances' Tentative Report. However, since various provisions of the U.S. Grain Standards Act of 1976 hinge upon each other—grain weighing, for example, is contingent on grain inspection—I want first to put weighing in the context of the overall legislation.

House and Senate conferees hammered out the U.S. Grain Standards Act of 1976 last October after five months of deliberation. The President signed the bill on October 20, and the legislation went into effect on November 20.

Although it followed the usual Congressional channels, the bill is considerably more than just another article of legislation. It is an acknowledgement by the Congress of the United States that the nation's grain weighing and inspection system has been abused. It is the most inclusive response the Congress could make to the trade's need for reform in the system and the nation's need to maintain the integrity of American grain in the world market. It is a tough answer to a tough situation.

Now it is up to the Federal Grain Inspection Service of USDA to enforce the mandates passed by the Congress.

Among the strongest of these mandates are the inspection and weighing provisions. Before the amended legislation was passed, there was no federal authority to either weigh grain or to supervise its weighing.

The weighing provisions of the Act of 1976 generally follow the same lines as those for grain inspection. On the export side, the bill gives the federal government the responsibility for official inspection of all grain shipped from the U.S. However, all grain moving through export points, whether inbound or outbound, must be officially weighed and the accurate weight must be certified by federal personnel.

The one exception is the Congressionally-authorized delegation of export inspection and weighing services to 10 qualified state agencies that were operating as of July 1, 1976. The 10 states are: Washington, Oregon, California, Minnesota, Wisconsin, Mississippi, Alabama, Florida, South Carolina, and Virginia. These states are now providing export inspection and most are providing some form of weighing service.

Where the Administrator of FGIS has delegated export inspection to the states, the certification of accurate grain weight may also be a state-delegated responsibility. However, where FGIS employees perform the actual inspection, they must also weigh the grain themselves or supervise its weighing.

I want to pause for just a moment for a quick review of semantics.

When I use the term "export grain," you can immediately associate the words "official weighing" and "mandatory."

Official weighing, as defined in the legislation, can be accomplished in one of two ways: first, employees of the Federal Grain Inspection Service or the 10 delegated state agencies can supervise 100 percent of the weighing performed by elevator employees, or; second, federal employees or employees of the 10 delegated state agencies can perform the actual weighing.

Official weighing, or the inspection and weighing of all U.S. export grain by the Federal Grain Inspection Service or the 10 delegated states, must go into effect by May 20, 1978. Altogether we will assume inspection and weighing responsibilities from 15 private firms and trade groups which are now designated as official inspection agencies at ports around the nation.

In contrast to the mandatory nature of official weighing at export, the word to associate with weighing at interior points is "permissive." Inland elevators may request either official weighing or a second type of service called supervision of weighing.

Official weighing would require 100 percent supervision of the weighing performed by elevator employees or the performance of

the actual weighing by FGIS employees or the designated agency.

Inland elevators opting for the second type of service would ask that USDA designate the supervision of weighing to qualified private firms, trade groups, or state agencies. USDA will determine the percentage of supervision that will be reasonable and adequate at interior points.

If interior markets request one of these services from USDA, then they must be in compliance with our regulations by November 20, 1978—but again, it is their choice.

I might mention that the Congress based the grain weighing supervisory system on the class weighing system that the railroads evolved for freight rate purposes. The railroads' Class I weighing is the equivalent of our official weighing. The rails' Class 2 weighing is a somewhat similar idea to the supervision of weighing service that will be provided, on request, at inland terminals.

It's interesting to note that the railroads could further effect demand for federal services at interior locations if they refuse to entertain claims unless an official weighing certificate is attached.

You can see that there is still some unsettledness in implementing certain points of the legislation. While we have the basic framework, the mandates carefully laid out by Congress, the Federal Grain Inspection Service welcomes outside views on implementation.

I was delighted to meet three weeks ago with one trade group that gave me a highly detailed 12-page proposal for reducing grain weighing supervision. After talking with these people, and studying their proposal, I am convinced that we can use many of their recommendations.

Some of the suggestions made by this group come under the third major duty given to federal personnel under the concept of official weighing. I have focused so far on federal personnel performing the actual weighing, and supervising the weighing. The Act also gives FGIS the responsibility for establishing standards for accurate weighing and weight certification, and for physically inspecting and testing weights and scales.

In its report, the trade association stated a strong case for a grain weighing supervisory system that is cost effective for the elevators, the buyers, and the sellers of grain.

Not only does USDA agree with this, but we're doing something about it. The Federal Grain Inspection Service is studying surveillance systems, such as continuous TV monitoring of manually-operated balance beam scales. This would provide 100 percent supervision, yet would free a federal employee from routine over-the-shoulder supervision so he can look for the problems.

But that is the more sophisticated side of our operations. On the

basic side, we are finding from our brief take-over experience that few states have laws regulating scale testing services. We look forward to developing standards that scale testers must meet to qualify for official approval.

We are requiring that export elevators have their scales tested no more than 60 days before we take over their weighing services, and we insist on being present when they are tested.

Since last November, when the U.S. Grain Standards Act of 1976 became effective, USDA has gone from a position of no responsibility for grain weighing to an authoritative position that demands comprehensive technical know-how.

We cannot pretend to acquire the necessary experience in the span of a few, short months. I feel that the representatives at this Conference are the nation's elite in the field of weights and measures. You have the years of expertise and experience from which we must draw. Therefore, the Federal Grain Inspection Service plans to follow, with little exception, the procedures and requirements for testing and tolerances adopted by this Conference and published by the National Bureau of Standards.

RECOMMENDED STANDARDS FOR SELF-CONTAINED SCALES

Presented by Daryl E. Tonini, Technical Director,
Scale Manufacturers Association

Mr. Chairperson, members of the Committee on Specifications and Tolerances, Ladies and Gentlemen. We appreciate this opportunity to address the Conference regarding the Scale Manufacturers Association's (SMA) recommendation to the 62nd National Conference on Weights and Measures for the Conference to adopt the SMA document. "Recommendation on Installation and Performance Standards for Self-Contained Scales for Weighing Highway and Off-Highway Vehicles and Their Axle Loads."

In 1972, the Conference adopted an SMA recommendation for the design and installation of pit-type scales for weighing highway vehicles and their axle loads. That document has proven to be a useful guide for those using, installing, and inspecting pit-type vehicle scales. Our purpose today is to request that the Conference adopt a companion recommendation for self-contained (portable vehicle) scales.

The purpose for seeking Conference action on the self-contained scale recommendation is to obtain a weights and measures community consensus regarding reasonable standards which can be applied, as required, to installation and performance standards for self-contained scales. We ask the delegates to note that adoption of this recommendation does not constitute an endorsement regarding the use of self-contained scales beyond that already allowed in Handbook 44. However, the SMA recommends that installation and performance standards for such systems meet the minimum supplemental requirements prescribed in this recommendation. For the benefit of those who may not have had the opportunity to study the details of the recommendation, I would like to review the proposal briefly at this time.

Purpose

The purpose of the recommendation is to propose nationally recognized installation and performance standards for self-contained highway and off-highway vehicle scales. It is anticipated that these standards will serve as the basis for better understanding among

weights and measures officials and manufacturers of these devices and will provide for more effective and more equitable utilization of self-contained scale weighing systems.

Pivots and Bearings

The recommendation requires that material used for pivots and bearings meet certain specified hardness criteria. (Pivots, RC58; Bearings, RC60). It also requires that pivots be sharp and straight and firmly secured in position. It further requires that they be mounted to provide equal and continuous contact of the knife edge and their bearings for the full length of the pivots and bearings. It is also required that the bearings be smooth and at least as hard as the opposing pivot. For loop bearings, knife edges are required to project slightly beyond the bearings in the loop.

Anti-Friction Points and Plates

The recommendation calls for use of anti-friction elements to limit longitudinal displacement between knife edges and their bearings. The material properties for these elements are described. There is a provision that the design be such that motion of the weighbridge or platform be restricted to not exceed one-quarter inch in any horizontal direction.

Weighbeams

The recommendation calls for full-capacity type weighbeams and requires that the minimum graduation for all fractional bars be the same. It also specifies that the weighbeam capacity shall not exceed the rated capacity of the scale (not including fractional bars). On main bars, notches may not be spaced closer than six to the inch. For recording weighbeams, the requirements for type figures are described. The recommendation specifies that the weighbeam fulcrum stand be securely fastened to a support which is adequate to prevent deflection or vibration.

(a) Poise movement characteristics are defined to require free movement with a minimum of side play. Construction of the poise requires that sliding friction between the poise and the bar be reduced to a practical minimum. Fractional poises on recording weighbeams are to be constructed to give a well defined stop at each graduation.

(b) The balance ball position shall be vertically adjustable; this adjustment to be with a self-contained screw or other device which will permit adjustment without requiring the ball to be rotated.

Indicating Elements

The recommendation specifies that the mechanical indicating element be mounted on a firm foundation adequate to prevent deflection or vibration.

Approaches

For self-contained vehicle scale installations at one location for less than six months, the recommendation requires a straight and level approach of the same width and in the same plane as the scale platform and at least one-half the length of the platform. Bulkheads at each end of the scale shall be placed so that fill for the approaches cannot interfere with any part of the scale mechanism. For axle load scales, the recommendation calls for approaches at both ends of the platform. Each approach for axle load scales shall be at least as long as the longest vehicle the scale is to weigh. For self-contained vehicle scales in commercial service installed in any one location for over six months, the approach provisions of NBS Handbook 44 paragraph UR.2.6.1. would apply.

Capacity and Size/Weighbridges

The recommendation provides a list of dimensions and capacities of commonly available self-contained scales. The recommendation specifies that main girders for weighbridges be adequate to provide the rated gross and sectional capacities specified.

Scale Levers

The quality of castings, steel tubing, and fabricated steel used for levels is specified to be clean, smooth, and uniform. Castings are to be free from blisters, blowholes, and shrinkage cracks. Welds are to be free of voids, cracks, and porosity, without undercut, and equal in strength to the parent metal.

Lever Fulcrum Stands

The quality of materials used in lever fulcrum stands is similar to that specified for scale levers. For the stand itself, it is recommended that the stand be so designed, constructed, and installed that under any practical conditions of loading, the resultant force through the bearings will fall within the middle third of the length and width of the base.

Standards

All scales represented as complying with this recommendation shall meet all the standards specified in this document and all ap-

plicable specification and performance requirements of NBS Handbook 44.

Foundations

A suitable foundation must be provided for the self-contained scale. The following minimum requirements are spelled out:

(a) There shall be an adequate bearing area to match piers to existing soil bearing capabilities, stabilized at the desired grade to support at least 3,000 lbs per square foot in pier locations.

(b) The foundation installer shall be responsible for determining that the soil characteristics meet the manufacturer's specification. If they do not, the installer shall notify the owner who shall arrange for design modifications to suit the soil conditions.

Piers

Requirements for piers (location and size as per manufacturer's specifications) are as follows:

(a) Shall be of concrete poured to a depth of not less than local frost line.

(b) Must be designed to support the combined loads applied by the scale and the weighbridge in addition to the maximum anticipated load on the scale. The pier system must be designed to distribute these loads uniformly over the ground base to minimize settlement. Any settlement which occurs shall be uniform throughout the structure.

(c) Piers shall be reinforced using a minimum rebar schedule of No. 4 (half inch diameter) rods placed on 6″ centers extending the entire width of the piers. Reinforcing rods are to be placed 3″ from the bottom and top surface of the piers. Tops of piers must be in the same level plane.

(d) If required by local regulation, anchor bolts shall be embedded in the piers according to the manufacturer's specifications.

Automatic Indicating Elements

The recommendation calls for a smooth finish for the tare and capacity bars and poises of automatic indicating elements. The value of the minimum graduation on the tare bar shall not be greater than the minimum graduation of the dial.

Electronic or Hydraulic Indicating Elements

(Where used) must comply with the manufacturer's recommended installation requirements.

Load Cells

The following minimum standards are given:

(a) Linearity: Output characteristics of the load cells shall be such that they will not cause the system's performance to vary beyond allowance tolerances.

(b) Temperature characteristics: Shall be such that they will not cause system's performance to vary beyond allowable tolerances over the normal temperature range for the application. If this range is not known or specified, it shall be presumed to be 15 °F to 115 °F.

(c) Capacity: Load cells shall be capable of withstanding loads equal to 150% of the rated capacity without change in span calibration and capable of withstanding loads equal to 300% of rated capacity without physical failure of the load cell structure.

(d) Moisture protection: Load cells shall be given an airtight seal to prevent moisture penetration.

(e) Finish: Load cells shall be provided with a corrosion resistant finish suitable for normal operating conditions for the scale.

Electric Load Cell Cabling

(a) All cabling shall be shielded and grounded.

(b) All shields shall be interconnected and carried to a common ground; this ground to be separate from the power source ground and shall be provided for the load cell/instrumentation circuit only.

(c) The ground rod shall be copper and, where possible, driven to the depth of the water table. Connection between the ground rod and common ground point of the load cell/instrumentation circuit shall be made with at least No. 10 gage copper wire.

(d) Cable insulation shall be with materials having good nonhydroscopic qualities and stable capacitance between conductors. All cable connections and junction boxes shall be properly protected against moisture penetration.

(e) Load cell cables to be physically separated from power cables and never run in the same conduit.

Power Source Unit

The power source for electronic instrumentation shall be reasonably free from harmonics and electrical noise transients.

(a) To be on a separate circuit back to the distribution transformer with no other loads connected.

(b) Fifteen AMP fusing unless otherwise specified by the scale manufacturer.

(c) One side of power source at ground potential.

Miscellaneous

In addition to the preceding, the recommendation includes standards for hydraulic load cell tubing and for protective finishing of parts for corrosion.

In summary, the Scale Manufacturers Association respectfully submits this "Recommendation on Installation and Performance Standards for Self-Contained Scales for Weighing Highway and Off-Highway Vehicles and Their Axle Loads" for adoption by the 62nd National Conference on Weights and Measures.

AAR STATUS REPORT ON STENCILED TARE WEIGHTS OF FREIGHT CARS

Presented by JOHN J. ROBINSON, Executive Director and Secretary, Operations and Maintenance Department, Operating Transportation Division, Association of American Railroads

Following a series of discussions with representatives of the National Conference on Weights and Measures concerning stenciled tare weights on railroad freight cars, AAR Mechanical Interchange Rule 70 was modified effective 1-1-73 to require the lightweighting and restenciling of most rail cars every (60) months. Specific tolerances were also specified for freight cars depending upon the weight of the car.

The basic provisions of Interchange Rule 70 were reflected in Section 16. Railroad Car Tare Weights of the Model State Method of Sale of Commodities Regulation adopted by the National Conference on Weights and Measures in July 1973. Following NCWM's action, the AAR widely circulated the model regulation to all member roads urging them to establish programs to insure that their freight car fleets were periodically lightweighed and restenciled in compliance with Interchange Rule 70 and the NCWM model regulation.

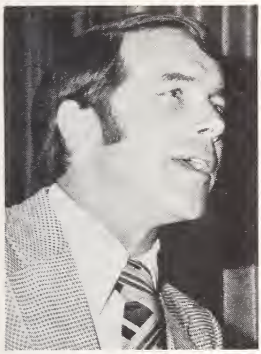
Beginning in 1974, the AAR has surveyed its members on an annual basis to determine the progress accomplished to date with regard to the restenciling requirements of Rule 70. On the basis of the number of cars reported lightweighed and restenciled during the years 1973, 1974, 1975 and 1976, it appears that the rail industry has restenciled approximately 65% of the serviceable Class I railroad freight car fleet for the four year period ending December 31, 1976. This includes some adjustment for new and rebuilt cars added to the fleet during this period, which are normally weighed and stenciled at the time they are placed in service. The five year (60 month) restenciling requirement of Interchange Rule 70 would indicate that at least 80% of the fleet should have been restenciled during this time frame. The national serviceable car fleet is about 1.2 million freight cars, and the industry is restenciling approximately 200,000 cars per year.

In defense of the rail carriers, however, several severe periods of shortages for various car types have been experienced since 1973, which have made it extremely difficult in many instances to withdraw cars from revenue service to be cleaned, lightweighed and re-

stenciled. A minimum of one and frequently two or three idle days per car may be required to accomplish this task. The AAR continues to urge its members to increase their tare weight restenciling activity. In connection with the use of these stenciled tare weights, the railroad industry position has and continues to be that these weights should only be utilized in connection with the computation of applicable freight charges, and should not be employed in the sale of commodities.

VAPOR RECOVERY—A CHALLENGE FOR WEIGHTS AND MEASURES

Presented by Darrell Guensler, Assistant Chief, Division of Measurement Standards, Department of Food and Agriculture, State of California



Vapor Recovery: What is it? This term refers to a program aimed at capturing evaporating hydrocarbons during transfer of gasoline. We will consider here that portion of the program which involves retail refuelling of automobiles. The regulatory and statutory basis for the vapor recovery program is the federal Clean Air Act as implemented by the United States Environmental Protection Agency. Actual field supervision of the program will be by local (county or groups of countries) pollution control districts. It is with these districts that state and local weights and measures will interact.

There are two basic types of vapor recovery system in use at the present time. One is the "balance system" and the other is the "vacuum assist system." They are illustrated in figures (1) and (2). A balance system is essentially a nozzle connected to an additional hose and piping which returns the captured vapors to the storage tank. The vacuum assist system employs some additional equipment to produce a partial vacuum in the vapor return hose. The main visible indicator of the presence of either system is a second hose back to the storage tank as well as some form of vapor collecting orifice on the nozzle. Several examples of vapor recovery nozzles are illustrated in figure (3).

The balance system is conceptually the simplest. It is a passive system which relies on direct displacement of vapors to storage. To be effective it requires a relatively tight seal between the vapor collecting orifice and the automobile fill pipe. Vacuum assist systems permit a much poorer seal but because of this also require additional processing equipment to handle the ingested air. This additional processing equipment has not in our experience had any weights and measures consequences beyond adding made trade jargon to be mastered. A "hybrid system" also is being developed which aspirates a portion of the flow of gasoline before metering in order to reduce the possible leakage of vapors. The required tightness of seal at the fill pipe is intermediate between the balance system and vacuum assist system.

The crux of weights and measures concern is that with a vapor recovery system the automobile gasoline tank is connected to the nozzle and dispensing hose to form a closed delivery system. Before the nozzle is physically connected to the vehicle, there is no system. It is no longer sufficient to verify the measuring accuracy in the retail meter since the accuracy of delivery is what we must be concerned with.

Now I would like to give you an overview of our experience to date. It is important to realize that what can go wrong, does seem to go wrong! The magnitude and frequency of such system breakdowns varies widely depending on maintenance, care in use, ambient conditions, and the type of vehicle being fueled. Every vapor recovery system observed has returned liquid to storage under some circumstances. These comments will be divided into three areas: nozzle manipulation, vehicle refuelling observations, and in-use reports.

Nozzle Manipulation

Because the nozzle is now a part of a closed recirculating system when attached to an automobile, any malfunction or bypass of the automatic shutoff device will lead to recirculation of gasoline after the tank has been filled. In some of the earlier balance system nozzles, for example, it was possible to deliver product at rates low enough that the venturi shutoff device could not operate. Continuous recirculation of gasoline with vehicles resulting in returns to storage of up to two gallons per minute was found to be possible in many different vehicle types without noticeable spillage. Although later nozzles have largely corrected this problem it is one which could return with wear or damage to the main liquid delivery valve. It is also possible to bypass the shutoff mechanically with (for example) a screwdriver on all the nozzles tested. This however is an obvious act and does not seem to us to represent a very real problem for weights and measures.

Finally, if a tight seal is maintained and the vehicle tank is pressurized, as might be possible with a balance system after repeated topping-off or vapor return hoze blockage, liquid can be forced back into the shutoff mechanism itself and liquid can be recirculated at the maximum delivery rate of the dispensing system which can be 12 to 15 gallons per minute. Although this is possible with minimal spillage with many nozzles into a closed 5 litre container, attempts with approximately a dozen vehicles led to copious spillage. This manipulation does not at this time seem to have the potential for widespread difficulties.

Although nozzle manipulation may appear the most dramatic aspect of weights and measures concern with vapor recovery sys-

tems, it does not seem to us to constitute the major portion of problems to date.

In connection with nozzle manipulation, the following example may be illustrative of the pitfalls. One unfortunate side effect of the response of one major balance system nozzle manufacturer to field retrofit nozzles to increase the minimum flow rate sufficiently to actuate the shutoff under all delivery conditions also made some of them almost impossible to use. This situation has largely been corrected through the actions of the manufacturer and his distributors. We mention it however as an example of the potential hazards in the development of this program. It has certainly made California weights and measures officials as well as all concerned more cautious.

Vehicle Refuelling Observations

Actual vehicle refuelling was performed in the self serve, dealer serve, and weights and measures technician serve modes with a liquid trap placed in the vapor return hose. The purpose of the trap was to catch all liquid, being returned in the vapor hose, to storage, so that it could be measured. This trap did not otherwise affect the operation of the system. The additional pressure drop introduced by the trap was measured and found to be an order of magnitude smaller than the pressure drop normally occurring over the thirteen foot long, ¾ inch I.D. return hose at the maximum anticipated flow rates. The trap capacity was typically 800 mL.

For vacuum assist and hybrid systems the pressure in the vapor return was periodically monitored with either a water manometer or a "magnihelic" gauge. The pressure was sensed by insertion of a hypodermic needle into the hose (unsatisfactory for extended field use because of needles bending and breaking), by insertion of an in-line test port in the hose, and by a specially designed adaptor placed in the neck of a five gallon weights and measures test standard. This adaptor is pictured in figure (4).

Table one summarizes a portion of our observations. A trap used is that in figure (5). In this table we have coded the different manufacturers. The purpose of this table is to illustrate typical behavior only. Systems A through C and system G all have a lowered pressure in the VR hose produced by various means. Systems D, E, and F are all balance systems. System F is noteworthy by having a liquid check valve in the vapor return hose. We feel this feature is highly desirable; by the way.

The returns were sporadic and unpredictable. They arise from a complex interaction of many factors, each of which affects the liquid flow of characteristics from the delivery nozzle into the fill pipe. The sporadic nature of this return is illustrated in table 2 which

summarizes three different sequences of observations of the same balance system type nozzle in different locations. This particular nozzle has a no-seal/no-flow device added. The second column of this table illustrates what happens when an automatic shut-off begins to fail sporadically.

Although certain vehicle types are more prone to liquid return than others (particularly vans, pickups, and vehicles with fill pipes with small entry angles), the behavior is not constant, and not necessarily predictable.

We have not obtained reliable figures on automatic shutoff failure. Such failure occurred several times during the refuelling observations and in each case the fill was terminated. The principal investigator reports that in fuelling his own vehicle, he has had two shutoff failures in the past fourteen months. While this hardly qualifies as sufficient evidence to establish a meaningful occurrence frequency, it indicates a problem does exist. It may be the most serious present problem with tight seal systems.

In addition to this malfunction mode, returns are observed during a fill as a continuous dribble and also as a splash back on beginning a delivery or on automatic shutoff. In large part, these represent what would have been spilled in the absence of vapor recovery.

In-Use Reports

County offices of weights and measures in the San Francisco Bay Area and San Diego County continue to report complaint summaries. The conclusion one reaches from these summaries is that the widespread use of balance system nozzles under the broad range of real world use conditions and maintenance demonstrates that instances of recirculation and spillage do in fact occur. Weights and measures officials in the affected areas do consider these systems to represent a problem.

One should realize that complaints are made after the fact and are often difficult to confirm unless the equipment has failed completely. Sporadic problems in delivery accuracy represent a particularly difficult area for weights and measures and is the one our California test program is trying to eliminate as much as possible.

Another aspect of the in-use reports needs to be mentioned: spillage, spitback, and forceable blowback produced by a pressurized gasoline tank. There is still some argument concerning whether or not spillage is greater with some vapor recovery equipment. The theoretical likelihood is that spillage would be greater since the possible penetration of nozzle spouts in fill pipes is less than it was, because of the space taken up by the vapor collecting bellows on the nozzles presently used. One vacuum assist nozzle in particular is especially prone to spill and spitback because of the

TABLE 1—*Vehicle Refuelling Observations*

	Vacuum Assist System A	Vacuum Assist System B	Vacuum Assist System C	Vacuum Assist System C	Balance System D	Balance System E	Balance System F	Balance System G
Flowing Pressure at Nozzle, in, W.C.	–0.2 to –0.5	–0.1 to –0.3	–4.0	–2.7				–0.1
Total Vehicles	159	122	100	115	595	185	100	228
Total Fuel Pumped (gal)	1348.8	1493.5	941	894.7	6558	2104	828.8	1742.9
Vehicles with Measurable Return	6 (trace) (3.8%)	9 (7.4%)	14 (14%)	2 (1.7%)	30 (5.04%)	12 (6.49%)	1 (1.0%)	39 (17.1%)
Vehicles Exceeding ½ cu in/gal return	0	0	1 (1.0%)	1 (0.87%)	10 (1.68%)	6 (3.25%)	0 0.0025	0 0.014
Average Return (cu in/gal)	0	0.011	0.017	0.0074	0.0158	0.036	0.23	0.083
Return Averaged Over Those Only With Return (cu in/gal)	0	0.18	0.137	0.26	0.54	0.56		
Spitback	35 (24%)	7 (5.7%)	19 (19%)	5 (3.3%)	46 (7.7%)	13 (7.0%)	12 (12%)	26 (11.4%)
Average Delivery	8.5 gal 0 cu in returned	12.2 0.13	9.4 0.16	7.78 0.06	11.0 0.17	11.4 0.41	8.3 0.02	7.6 0.110

TABLE 2—*Vehicle Refuelling Observations*

BALANCE SYSTEM H			
Total Vehicles	196	64	87
Total Fuel Pumped (gallons)	1628.8	807.1	1071.8
Vehicles With Measurable Return	13 (6.6%)	14 (22%)	3 (3.4%)
Vehicles With Return Exceeding ½ cu. in./gallon	2 (1.0%)	5 (8.0%)	0 (0%)
Average Return (cu. in./gallon)	0.016	0.333	0.0032
Return Average Only Over Those With Return (cu. in./gallon)	0.25	1.06	0.131
Spitback	14 (7.1%)	30 (46.9%)	25 (29%)
Average Delivery	8.31 gallons 0.13 cu. in. returned	12.61 4.20	12.3 0.04

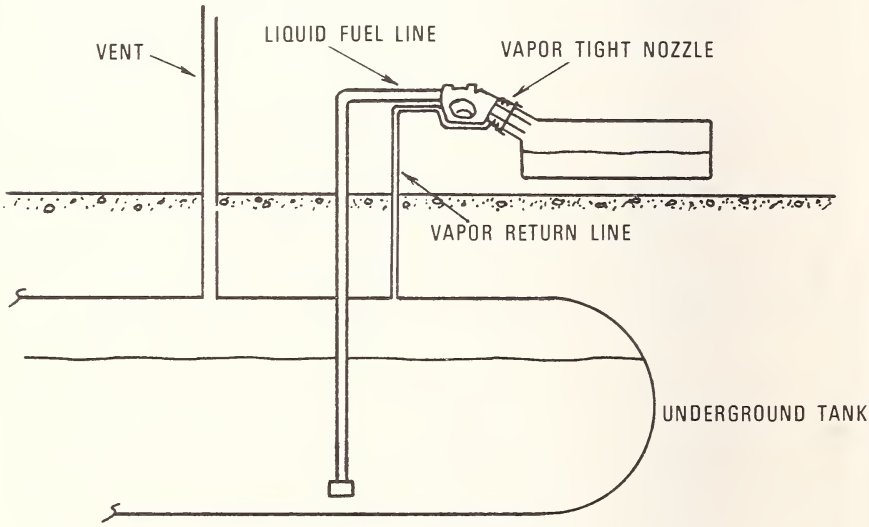


FIGURE 1. Vapor balance.

location of the vapor collecting hose relative to the nozzle sprout. With all balance system nozzles tested to date, some tank pressurization can and does occur particularly when underground plumbing has been so laid as to be prone to liquid blockage of the vapor return line. Even in the absence of partial blockage, too rapid fuel delivery will also partially pressurize the tank leading to repeated premature shutoff as well as possible recirculation and spill.

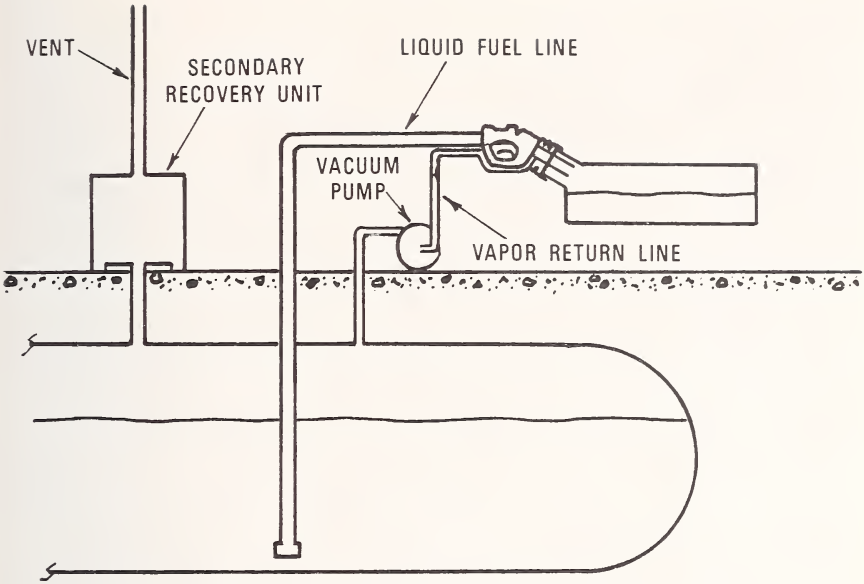


FIGURE 2. Vacuum assist with secondary recovery.

FIGURE 3. Vapor recovery nozzles.

In concluding this overview we emphasize that our discussion of these tests represents a discussion of the problems of type approval

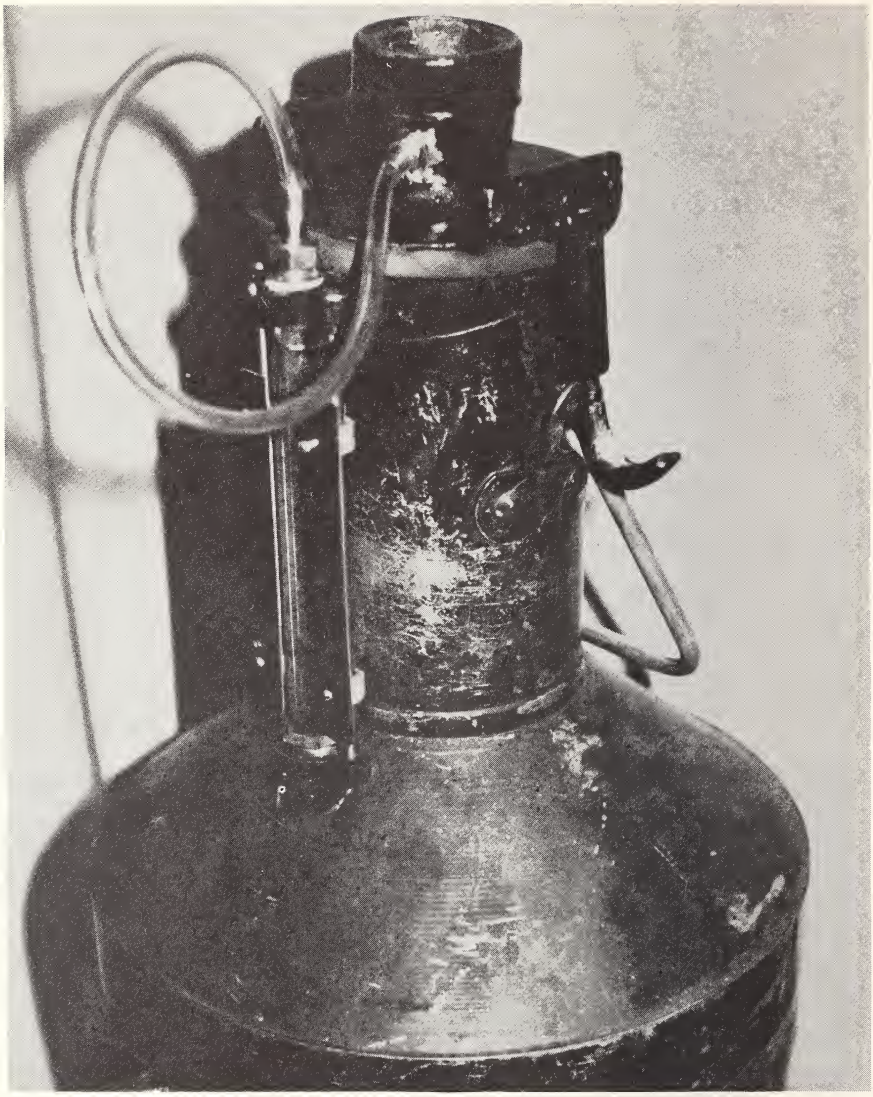


FIGURE 4. Adaptor mounted on test standard.

testing of devices being introduced as a result of technology forcing regulations by a government agency. The primary goal of our work to date is to come to understand vapor recovery system behavior sufficiently well that we can establish meaningful test procedures and regulations for routine field use, so that the "measurement accuracy" of vapor recovery systems used in California can be safely assured.

By now the reason for the title of this address should be abundantly clear. The challenge is one of establishing meaningful and achievable design criteria. The challenge is one of formulating more

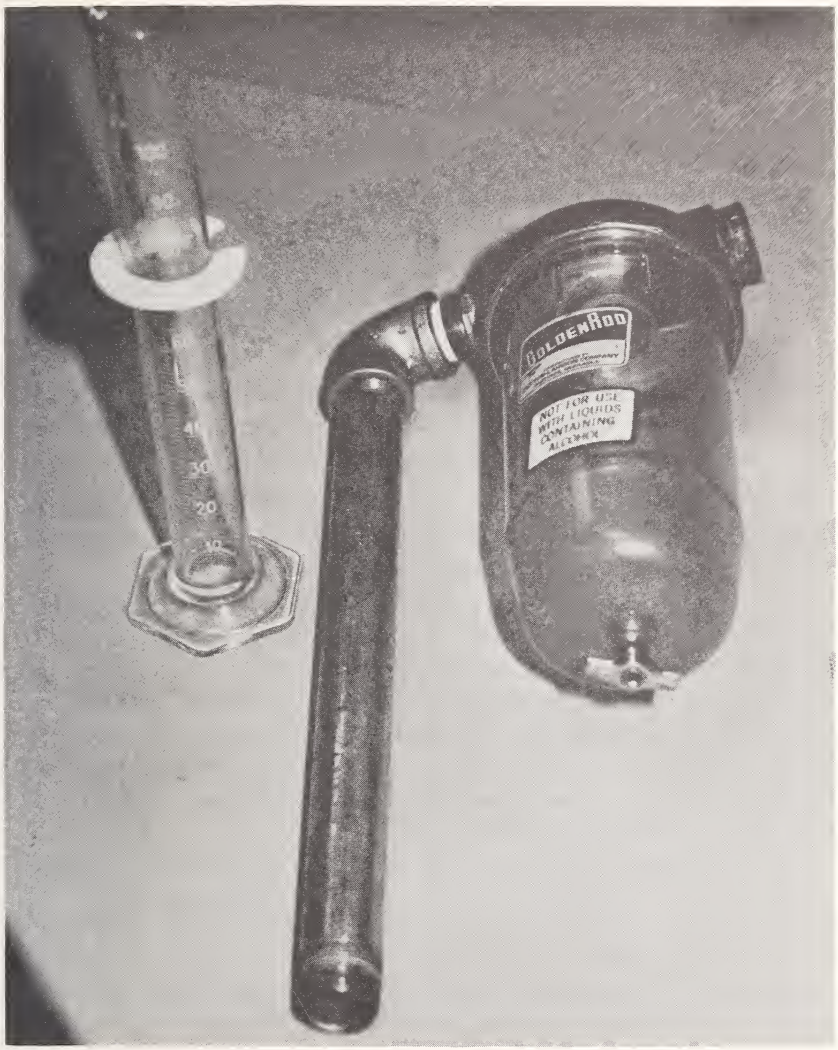


FIGURE 5. Liquid trap with drain and graduate for quantity measurement.

complex delivery system tolerance requirements with their associated test procedures and test standards. The challenge is one of facing a rapidly changing technology evolving under a stimulation whose primary concern is with vapor collection efficiency rather than measurement accuracy.

We recommend that the Conference consider vapor recovery system regulations consisting of three parts:

1. liquid shutoff valve requirement.

2. delivery tolerance for fueling of vehicles.

3. assurance of proper operation.

The first two of these are contained in the following proposal:

Vapor Recovery Systems

Retail motor fuel dispensing systems which recover or control evaporating hydrocarbons while dispensing product shall:

(a) contain an effective automatic liquid shutoff valve which is actuated when the tank or container into which the product is being delivered is full.

(b) be so designed and constructed that no more than 8 mL (½ cubic inch) of liquid is returned to storage per gallon delivered in fuelling of representative vehicles.

The application and intent of the automatic shutoff requirement is primarily to give field inspectors a specific code section on which to base removal of malfunctioning nozzles from service.

The delivery tolerance is a type approval criterion and is not intended at this time for routine field test. The magnitude ½ cu. in./gallon is based on the volume dependent portion of the acceptance tolerance for liquid measuring devices. The actual application of the tolerance is to be for vehicle fuelling, in both self and dealer serve modes, a representative fleet of several hundred vehicles as specified in test procedures. The liquid measured would be that in a trap in the vapor return hose.

This tolerance does not apply to liquid recirculated because of "topping off" or deliberate operator overfill. (These questions would be considered separately in the examination of the nozzle as to whether it facilitates fraud (H44: G-S.2)). Procedures for taking account of an infrequent equipment failure occurring during this portion of the test would be prepared. The intent of the delivery tolerance is to apply to the normal range of field fuelling of representative vehicles.

Assurance of Proper Operation

This portion of the regulation remains to be written in detailed form. The intent is to give consumers and dealers some way of knowing whether the system is operating properly and not returning liquid to storage. This assurance could, for example, come from one or more of the following:

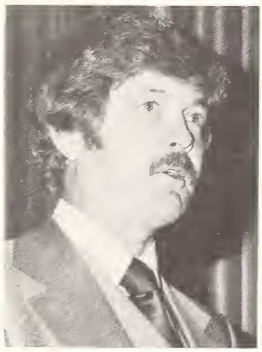
- Operational warning device to indicate when liquid beyond a specified amount enters vapor hose.

- Indicating device or mechanism by which liquid in vapor hose can be observed.
- Liquid check valve in vapor hose.
- No seal or poor seal at fill pipe-nozzle interface.
- Better overall system design—make it "fail safe"!

If weights and measures is to maintain its essential role in our society we must meet this challenge effectively. By working together we will be able to succeed in this endeavor.

OPPORTUNITIES, EFFECTS, AND BENEFITS OF OIML: AN INDUSTRY VIEWPOINT

Presented by Ellis B. Fitzgerald, Manager, Engineering Services, Fairbanks Weighing Division, Colt Industries



Mr. Chairman, members of the S&T committee, ladies and gentlemen. It is with tremendous pleasure and great pride that I stand before you today to address this important conference. When asked to speak on the subject of the International Organization of Legal Metrology, I must confess that I was at a total loss and spent many worried hours trying to decide on the content of a presentation which would be meaningful and useful to the members of this conference. The technical programs and organizational structure of OIML have been presented to you many times, and I did not feel that listening to another individual discuss the same subject would stimulate or interest you.

The organization of the National Conference on Weights and Measures 62 years ago was the first step toward the development and promulgation of a set of uniform weights and measures laws and enforcement activities. Industry, weights and measures, and consumers have all benefited from the work of the Conference. Uniform enforcement of the model laws and technical requirements have immeasurable benefits to the consumers and industrial activities in your state or jurisdiction. While our laws and regulations, enforcement practices and technical expertise are in my opinion second to no other country, they are not in tune with the rest of the world. This is not meant to be critical but rather to point out the vast resource of untapped knowledge available to us within the International Organization of Legal Metrology. This knowledge, I might add, is a two way street. The United States, through the National Conference is itself a vast resource.

Sixty-two years ago the United States recognized a need for model laws dealing with weights and measures activities. Twenty-two years ago the rest of the world, recognizing the same need, took steps toward that end by forming OIML. In 1972 the United States, wishing to reduce the foreign trade deficit and enhance the ability of U.S. manufacturers to market measurement equipment on an international level, joined OIML. This was a timely decision in that the United States Congress would shortly take steps to bring

the U.S. in tune with the rest of the world in a uniform system of measurement.

By joining OIML, many opportunities to take advantage of and influence world thinking on the role and activities of weights and measures have been opened. As previously stated, OIML is to the rest of the world what the National Conference is to the United States. The technical output of OIML is in the form of model laws called "international recommendations" just as the technical output of our National Conference is in the form of model laws.

The opportunities offered for United States participation in the drafting of new international recommendations and influencing changes to existing international recommendations are many. The United States currently has the administrative responsibility for several of the technical committees involved in weighing or measuring including Pilot Secretariat 7, "Measure of Masses," and Pilot Secretariat 22, "Principles of Metrological Control." In addition to responsibility for these and other important Pilot Secretariats, the United States also had responsibility for many of the subcommittees or reporting secretariats.

Presently, the process of organizing a U.S. National Working Group for Pilot Secretariat 7 and its reporting secretariats is underway. The National Conference is represented on this working group through the S&T committee members. Other groups represented include: The Scale Manufacturers Association, The National Scalemen's Association, certain Federal agencies, and other interested individuals. Work in process includes the review of International Recommendation No. 3, "Metrological Regulations for Non-Automatic Weighing Machines" and International Recommendation No. 28, "Technical Regulations for Non-Automatic Weighing Machines." These IR's could be compared to the specifications and tolerances sections of the Handbook 44 scale code and the purpose of the review is to develop U.S. recommendations for changes to these two documents. Other work plans call for the development of international recommendations on field test procedures and test equipment.

Participation in these activities allows the United States weights and measures officials, private industry and consumer groups not only to take advantage of and learn from world thinking on metrology, but also offers excellent opportunities to influence that thinking.

The effects of the U.S. joining OIML, coupled with recent congressional action calling for converting the United States system of measures to the International System of Units, could have a tremendous impact on weights and measures activities. The need to rewrite certain model laws such as H44 and the method of sale

of commodities are problems we have not yet faced. Over the next 5-10 years the National Conference will have some difficult decisions to make as we draw closer to a metric measurement system. Dealing with metrication will require proper planning and well coordinated long range programs by the National Conference if we are to relieve instead of contribute to much of the confusion this subject is likely to impose on industry and the consumer.

Much of the work required directly parallels many of the activities and objectives of OIML. Many of the technical problems have already been answered or are in the process of being studied.

The benefits of U.S. membership and participation in OIML are many. These benefits are equally real for weights and measures and U.S. industry.

I have already mentioned the need for the National Conference to re-examine its model programs in preparation for a metric United States.

I have also mentioned that many of the technical problems we will be facing have already been answered or are being studied by OIML.

Participation by U.S. weights and measures in these OIML activities could be beneficial in helping develop new programs.

Other benefits to weights and measures include:

- World recognition of the role and activities of U.S. weights and measures.
- The opportunity to learn and gain experience from a broad base multi-nation system.
- The opportunity to influence and help mold an international system of legal metrology.

Benefits to U.S. industry include:

- The ability to market abroad U.S. manufactured measurement equipment without being put to a disadvantage due to multi-nation rules on design and performance.
- The opportunity to participate in the process of world standards development on the design and use of measurement equipment.

Already we are beginning to see OIML influence in our own Handbook 44. This year's S&T Committee Report, while making no specific recommendations, does discuss the subject of resolution versus accuracy. The question of "number of divisions" relating to the accuracy of a device is fundamental in the application of weigh-

ing and measuring equipment. Under OIML system, the value of the division indicates the accuracy of a device, while under the U.S. system, accuracy is a function of a percentage of the load. It is in this area, along with strong emphasis on design requirements, that we see the fundamental difference between U.S. and OIML philosophy.

It is not my purpose here today to promote one system philosophy over the other. Indeed, while it may sound like I've been trying to sell OIML, that has not been my purpose. My purpose is simply to reveal to you how we in industry view U.S. participation in OIML and how we feel the organization could prove beneficial in assisting U.S. weights and measures in providing a broad base of technical knowledge available as a resource in answering some of the difficult problems we are going to be facing in the near and distant future.

The scale manufacturers association through its member companies stands ready to participate in and support U.S. involvement in OIML. The National Bureau of Standards has set up the organizational structure whereby U.S. objectives in OIML membership may be realized. Individuals from NBS and private industry who are willing to work on OIML national working groups have been identified. What is missing to date is the mechanism whereby the National Conference could support these activities. Individuals from U.S. weights and measures are needed to chair and work in several of the reporting secretarial working groups. The bringing together of industry, weights and measures, and NBS, dedicated to the fulfillment of U.S. objectives in OIML membership will guarantee U.S. influence and ultimately assist us in answering some of the problems we will be facing here in the U.S.

AFTERNOON SESSION—MONDAY, JULY 18, 1977

(TRAFFORD F. BRINK, *Vice Chairperson*, Presiding)

QUANTITY PACKAGE STATEMENT: SHEETS AND PILLOWCASES

Presented by ALLAN TAYLOR NANCE,
J. P. Stevens & Company, Inc.

I am pleased to appear before you today as a representative of the American Textile Manufacturers Institute. The American Textile Manufacturers Institute is the national central trade association for the United States' textile industry representing spinners, weavers, knitters and finishers who produce more than 85 percent of this country's textile production.

We appreciate this opportunity to talk with you today about two important matters which affect the U.S. textile industry directly. The easier of the two matters concerns the appropriate disclosure of the statement of size on packages in which flat sheets and pillowcases are sold at retail. The more difficult topic is the width identification of yard goods sold to consumers in retail stores.

With respect to sheet and pillowcase measurement, current labeling disclosure, as set forth in Section 10.9.2 of the 1976 Model State Packaging and Labeling Regulation, is by the width and the length of unhemmed sheets and pillowcases. This measurement is the "size before hemming."

The Model State Packaging and Labeling Regulation adopted the conventional unhemmed size criterion, and textile manufacturers have continued to disclose those conventional measurements while the fabrication of both of these items is so automated in many cases that cut size exists only during the manufacturing process. In the case of both of these items, it is appropriate to observe that manufacturing practices are intended to create a product which fits the specific size of the pillow or mattress for which it was designed, and each is of such a construction that nominal variance in the specific size of pillows and mattresses does not appreciably detract from either the appearance or the serviceability of the product.

Since it is the size of the finished pillowcase or sheet which is meaningful to a consumer, it is this finished size that we recom-

mend for incorporation in the Model State statute. In order to implement this change, we have suggested language set forth on page 53 of your National Conference on Weights and Measures Program.

If approved by the Conference, we would suggest the following two points to make the adoption of this proposal more orderly. First, we suggest that the change be effective nationwide. You can imagine the problems which would be encountered if any given company was selling to stores throughout the United States and some states, or even regions, required hemmed measurements while others required unhemmed measurements or cut size. You will also realize that an inventory control problem would arise which would be extremely difficult to cope with and would result in undesirable additional costs being passed on to the consumers purchasing these products.

We would also recommend that if the Conference endorses this concept, that the change to finished measurements should be immediately approved, but that the requirement for finished measurement should be phased in over a period of at least one year. This, we feel, will allow for an orderly transition.

The second matter about which I wish to speak today has to do with the width of fabrics sold at retail generally for home sewing and known as yard goods. The textile industry has been using the so-called "range method" for identifying the width of yard goods for many years. To our knowledge, this method is not a problem. It consists of identifying the fabric width generally within a minimum/maximum width of one or two inches so as to conform with actual variations within and between each of the various standard sizes of bolts and rolls of yard goods. This practice exists because there are so many variables involved in the manufacturing process which may add to or shorten the width of the fabric. These include the type of fabric or blend of fiber being used, the design of the fabric (more specifically, whether it is woven or knitted), tensions involved during the fabric forming process, handling of the fabric after it has been formed, dyeing and finishing treatments, and the conditions under which these treatments are administered. With so many dissimilar factors involved, there are many opportunities for slight width variations in the final product.

The State of California has suggested amending Section 10.9.2(k) of the Model State Packaging and Labeling Regulation to require an extremely specific statement of the net measure of textile yard goods packaged in the bolt or by the roll for either wholesale or retail sale. With all due respect to the judgments made by those in California who have fashioned this more rigorous statement of quality, we must firmly and unequivocally oppose it.

The range method, as we described it above, is used for the sale of textile yardage sold at retail and sold directly to cutters and sewers in the apparel manufacturing area. This present method for identifying the width of yard goods has been, to our knowledge, acceptable in the marketplace. Surely it is a known standard with which consumers of both retail and wholesale yardage are familiar. A change from this well-established practice would more likely confuse all sectors of the consuming public. Also—to demand a rigid measurement of width within and between comparable fabrics would obviously require more control procedures during the manufacturing process. This in itself would substantially increase the cost to textile manufacturers and, in turn, the cost to consumers. We believe that an increase in prices because of width variation control is neither wanted or needed by the consumers of yard goods.

We draw your attention to the comments made by the National Home Sewing Association as printed on Page 52 of your Program and confirm their conclusions that a change to a single measurement could increase the costs and result in misconceptions on the part of consumers.

We ask your careful consideration of this question of more specific measurement for yard goods. With all of the inescapable cost increases which burden our industry, we are extremely loath to incorporate yet another, particularly when we are convinced it is unnecessary.

Thank you for giving us an opportunity to present our views.

THE CONSUMER AND THE *R*-VALUE OF INSULATION

Presented by Chock I. Siu, Physicist,

Thermal Engineering Section, Building Environment Division,
Institute for Applied Technology, National Bureau of Standards

The current and projected energy situation has made it necessary to reduce building energy consumption in all possible ways. One significant way to reduce energy use is through better insulation of the 80 million dwelling units in the United States because they consume approximately 19 percent of the total national energy, of which 11 percent is for heating and 0.7 percent for cooling. [1]* The technical and economical consequences of additional insulation in new and existing housing are being studied, and sound energy-saving recommendations are rapidly reaching the public. This, together with President Carter's programs on insulation, will encourage millions of homeowners to better insulate their houses. In selecting insulating materials the concerned consumer is asking, "What is the *R*-value of the insulating material I am about to purpose and what does it mean?"

A simplified answer is that the *R*-value is a number that indicates the resistance of thermal insulation to the flow of heat. The higher the *R*-value, the higher the resistance. Manufacturers of insulating materials, the construction industry, trade associations, and the voluntary standard community have been using the *R*-value as an index to rate and compare insulation performance for many years. Federal Government agencies such as the Federal Housing Administration and the General Services Administration use the *R*-value in their specifications. Model Codes agencies have adopted it. Consumers are accepting it because it is so simple to understand and use.

In choosing the home insulating materials, besides the *R*-value, there are other properties to consider such as flame spread, surface burning characteristics, moisture absorption, rodent infestation, mildew and fungi resistance, odor emission, settling, corrosiveness, starch content, strength and density. However, the *R*-value is the most important criterion as a measure of energy-saving performance of insulated materials.

---

* Figures in brackets indicate literature references at the end of this paper.

The purpose of this talk is to provide information on the R-value as a measure of the thermal performance of insulation material useful for consumer guidance and confidence. Discussion here is limited only to those things about R-values related to this aspect.

What is R-Value?

The thermal resistance, symbolically R, of an insulating material represents its ability to reduce heat flow. Simply stated, it is an expression of insulation effectiveness. Thermal resistance of a homogeneous material at steady-state heat flow and temperature is related to the thickness of an insulating material as follows: $R = x/k$, where x is the thickness in meters or inches and k is the thermal conductivity in W/(m • K), or Btu •in/(h • ft^2 • °F). However, equal thicknesses of different insulating materials may have different R-values because their values of thermal conductivity are usually different. Comparing the insulating effectiveness between two different types of insulating material can be done by comparing their resistance per unit thickness, which will be denoted by R_1 in this talk. However, two different products installed at different thicknesses to give the same R-value perform the same. Thus, the R-value provides the consumer with a simple way to compare and to buy insulating materials.

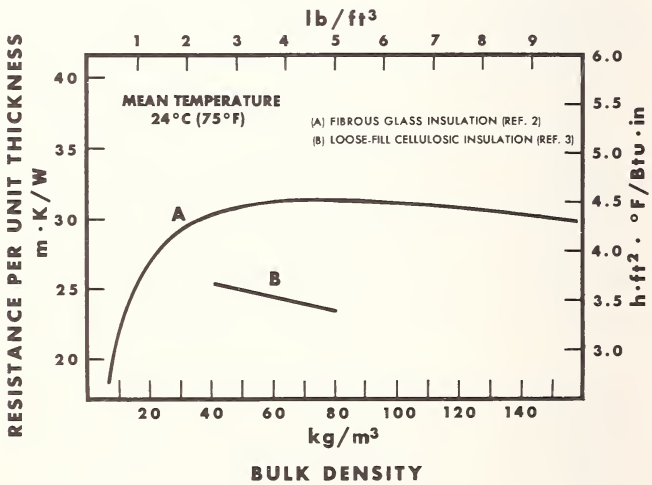


FIGURE 1. Variation of resistance per unit thickness with bulk density for some insulation at 24 °C (75 °F) mean temperature.

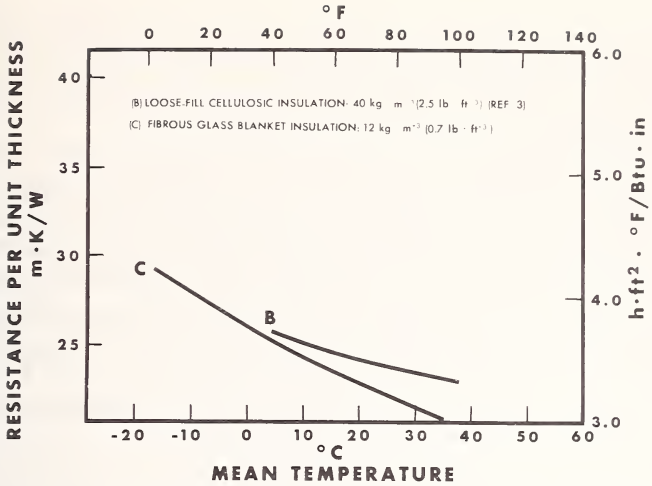


FIGURE 2. Variation of resistance per unit thickness with mean temperature for some materials.

Density, Temperature, and *R*-Value

R-values of building insulating materials are influenced by their density as shown in figure 1, and the temperature to which they are exposed, figure 2. Figures 1 and 2 are not conventionally drawn; each figure represents two separate graphs. The unit thickness of the left ordinate is meter, while that of the right ordinate is inch; everything else is conventional. These figures illustrate the need for accurate consumer information.

Figure 1 shows variations in the resistance per unit thickness, R_1, with density at mean temperature 24 °C (75 °F). This figure indicates that at a fixed temperature the weight aspect, bulk density, of a given insulating material is related to its measure aspect, resistance per unit thickness (a measure of thermal performance). Several other features of this figure are worth noting. First, figure 1 shows the necessity of specifying density when citing resistance values. Thus, it is incorrect to state categorically that one type of insulating material is thermally more effective than another. For example, Figure 1 shows that the R_1 value of fibrous glass blanket insulation A at density 24 kg/m^3 or (1.5 lb/ft^3) is greater than that of 48 kg/m^3 or (3 lb/ft^3) cellulosic insulation, while the R_1 value of material A at density 8 kg/m^3 or (0.5 lb/ft^3) is less than that of material B at 48 kg/m^3. R_1 values of fibrous glass blanket insulation depend on fiber diameters, so that it is incorrect to attach to a particular type of product a specific value of R_1. Similarly, variability of the R_1 for cellulosic insulation is sufficiently large [3] so that is is incorrect to assign a specific value to the product.

Sometimes the variability of the R_1 value of cellulosic insulation from a given manufacturer may be large enough [3] that it would be incorrect to attach a fixed R-value to all cellulosic insulation manufactured by the same manufacturer.

Secondly, anything that changes the density of the material, such as compaction, causes R_1 to change. Within the range of density for which the slope is positive, such as that portion of curve A below about 5 lb/ft^3, R_1 increases on compaction. For the range of density for which the slope is negative, such as curve B and that portion of curve A above about 5 lb/ft^3, R_1 decreases on compaction. The magnitude of the change in R_1 depends upon the magnitude of the slope. For example, for curve A, below about 2 lb/ft^3, R_1 changes rapidly with compaction; the change is slow above 3 lb/ft^3.

Thus, anything such as installation practices, compression and long term settling which changes the physical dimensions or bulk density of the material from its production-line value will result in different R-values of the installed from that of the production-line product.

For example, compressing two 3½-inch thick R-11 (measurement made on production-lines samples) batts of insulation made from material B in figure 1, into the 3½-inch space between the studs of a wall may result in R-14, not R-22. Also, a 6-inch R-19 batt (measurement made on production-line samples) made from type B material, fig. 1, compressed into the 3½-inch stud space may yield R-13, not R-19. Such differences would likely decrease if the manufacturer would provide the user with clear instructions on the proper way to install his product.

Finally, in the absence of convective and radiative heat transfer, R-values of installed thickness, X, may be obtained from $R = xR_1$. Thus, an R-30 h • ft^2 • °F/Btu value may be obtained using about 8 inches of 2.5 lb/ft^3 cellulosic insulation; about 3 inches of it is needed to give R-11.

Figure 2 shows variations in resistance per unit thickness with respect to mean temperature to which the insulating material is exposed. This figure shows the necessity of citing mean temperatures when stating R-values. For the purpose of commerce, room temperature or some arbitrary average temperature of the heating and cooling seasons would be reasonable choices. However, two different temperatures, appropriate to the heating and cooling seasons, would provide the buyer with a better basis for making his purchase. More elaborate schemes such as dividing the country into climatic zones would be most effective. But, these would be more appropriate for inclusion into product literature rather than placement on a product label.

Test Methods

R-value relates to performance, and requires acceptable test methods for the evaluation of commercial products. The American Society for Testing and Materials (ASTM) Committee C16 on Thermal and Cryogenic Insulating Materials [4] lists eighty-six (86) standards dealing with subjects such as definitions, test methods and specifications covering compositions, dimensions, and physical properties of thermal insulations. Physical properties include thermal conductivity (resistivity) and conductance (resistance), density, standard sizes, fire resistance, dimensional tolerances, handleability, etc. Sixty-eight (68) of these have been approved as American National Standards by the American National Standards Institute (ANSI). Although other test methods not listed as ASTM standards may produce acceptably accurate results, voluntary consensus standards, such as ASTM and ANSI standards, meet more completely the needs of commerce. Table 1 lists ASTM standards relevant to density and R determination.

This raises two major problems. First, in ASTM standards for determining R, specimens are tested in the dry condition. Strictly real situations are not duplicated. Moisture content, degradation, settling and shrinkage of the insulating material alter the R-values of all insulating materials. This problem is yet to be resolved.

Next, in certain tests, such as ASTM C177, the tests are made on specimens 25 mm (1 inch) thick or less, while practically all applications involve thicknesses greater than this. In principle, resistance may be calculated from resistivity only in the absence of radiative and convective heat transfer. Appropriate test methods such as ASTM C687, C518 and C236 should be used to determine directly the conductance or resistance of the insulating materials at application levels of thicknesses; the consumer needs to know the R-value he may expect for various installed thicknesses of insulating material.

Apparatuses for measuring R must be calibrated. This is done by making measurements using reference specimens with known thermal conductivity values. The National Bureau of Standards has a fibrous glass material which has undergone several national and international round-robin tests. [5] It is a specially prepared high-density fibrous glass material formed into a semi-rigid board with phenolic binder. The material has bulk densities between 100 and 170 kg/m^3 (7 and 11 lb/ft^3) and a thermal conductivity of 0.0325 W/m • K (0.225 to 0.230 Btu • in/h • ft^2 • °F) at 24 °C (75 °F); an R_1 value of about 4.4 h • ft^2 • °F/Btu • in. Results of measurements made on the NBS guarded-hot-plate apparatus are in good agreement with standards laboratories of other countries. NBS fibrous glass samples are being used by industrial, commercial

testing, and academic laboratories to calibrate ASTM C177, ASTM C158 and other types of apparatuses.

The NBS fibrous glass material is of high density and its thermal conductivity lies within a rather limited range of values. The latter does not present major problems since its thermal conductivity value is close to those of most insulating materials used in buildings. However, because it is high density, heat transfer is by solid (fiber) and gaseous conduction. It would be desirable to have a low density reference material in which other modes of heat transfer take place. Although such materials exist, tests should be conducted to determine their suitability as reference materials.

TABLE 1. *ASTM Test methods for the determination of density and R-value of insulation*

ASTM Designation	Application
* C167 †	Density of blanket or batt-type insulation
C519	Density of loose-fill building insulation
C520	Density of granular insulation
* C177	Thermal conductivity or resistivity of homogeneous building insulation Effective thermal conductivity or effective resistivity of non-homogeneous building insulation Thermal conductance and resistance of moderately thick building insulation
* C236	Thermal conductance or resistance of thick building insulation Thermal transmission
* C518	Same as C177 Thermal resistance of low-density mineral fiber and blanket insulation at installed thickness
* C687	Thermal resistance of low density fibrous loose-fill insulation

* ANSI Standard † Title given in appendix

Laboratory Accreditation

Adoption of performance specifications requires reliability of test data. This demands ascertaining the professional and technical proficiency of testing laboratories that serve regulatory and nonregulatory product evaluation and certification needs. The vehicle to accomplish this was initiated in 1976 when the Department of Commerce found the need to accredit testing laboratories that test thermal insulating materials under the Procedures

for a National Voluntary Laboratory Accreditation Program (NVLAP). "The goal of this program is to provide, in cooperation with the private sector, a national voluntary system to examine upon request the professional and technical competence of private and public testing laboratories that serve regulatory and nonregulatory product and certification needs. The program is intended to accredit those laboratories that meet the qualifications under these procedures." [6]

Measurement services associated with thermal insulation will be the first [7] to undergo the accreditation procedures set forth in NVLAP. When fully implemented, NVLAP will make available to manufacturers of thermal insulating materials listing of all testing laboratories accredited under NVLAP.

R-Values and Product Labeling

Although the use of *R*-values on product labels of insulating materials provides the consumer with an equitable and fair basis for purchase, labeling practice should be uniform to avoid confusion.

Figures 1 and 2 illustrate the need to cite density of an insulating material and the mean temperature to which it is exposed when giving its *R*-value. However, for a particular product, it is only necessary to cite mean temperature along with the *R*-value.

Minimal information necessary for consumer guidance should include coverage (width and length), thickness and *R*-value at some specified mean temperature. The choice of units needs special consideration in view of our national effort towards conversion to the use of metric system of units. In this country, all concerned with the heating and cooling of buildings are accustomed to using $h \cdot ft^2 \cdot {}^\circ F/Btu$ for *R*-values.

For batt or blanket-type insulant, the *R*-value and temperature can be stamped on the product itself or the package. For loose-fill insulating material, minimal information should include the *R*-value at 24 °C (75 °F) for corresponding installed thickness and coverage in tabular form. It would be desirable to include in the label the corresponding weight of material per unit area. Coverage necessary to attain a specified performance level may be expressed in terms of square foot of coverage per bag of insulating material to attain a specified *R*-value. More conveniently, coverage may be expressed in terms of the number of bags of loose-fill insulation per 1000 square feet.

All *R*-values affixed to labels should be based on measurement made using nationally recognized test methods.

Conclusions:

As a measure of thermal performance of commercial insulating materials, the R-value has the following advantages:

1. It is simple to understand, easy to use, and directly related to energy saving.
2. There exist nationally recognized standard test methods for R-value.
3. The "National Voluntary Laboratory Accreditation Program" for thermal insulating materials is being implemented.
4. There is wide usage of the term.
   A. In federal specifications, model building codes and energy conservation documents.
   B. By manufacturers of insulating materials, construction industry and trade associations.
5. Consumers accept it.

Product labeling of insulating materials should be uniform to provide consumer with an equitable and fair basis for purchase. With regard to thermal performance, minimal information on labels necessary for consumer guidance for purchase of insulating materials should include its coverage (width and length), its thickness, and the corresponding R-value at 24 °C (75 °F). Instructions on proper installation practices would be highly desirable.

Better consumer information on the R-value is provided by using measurement procedures in line with actual usage conditions such as installed thickness, moisture content, settling, average temperature and temperature difference.

REFERENCES

[1] Stanford Research Institute, "Patterns of Energy Consumption in the United States", Nov. 1971, Report to the Office of Science and Technology.

[2] "ASHRAE Handbook of Fundamentals", American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc., New York, 1972, p. 293.

[3] Tye, A. P., ASTM J. Testing & Evaluation, 2, 176 (1974).

[4] 1976 Annual Book of ASTM Standards, "Thermal and Cryogenic Insulating Materials; Building Seals and Sealants; Fire Tests; Building Constructions; Environmental Acoustics," Pt 18, American Society for Testing and Materials, Philadelphia, Pennsylvania, 1976.

[5] Symposium on Thermal Insulating Materials, STP No. 119, American Society for Testing Materials, Philadelphia, Pennsylvania, 1951, p. 36-44.

[6] U.S. Department of Commerce, Federal Register, Vol. 41, No. 38, February 25, 1976, p. 8163-8168.

[7] U.S. Department of Commerce, Federal Register, Vol. 42, No. 47, March 10, 1977, p. 13326-13336.

APPENDIX

Some ASTM Standards Relevant to the Use of *R*-value in Marketing

C167—Thickness and Density of Blanket or Batt-Type Thermal Insulating Materials

C177—Steady-State Thermal Transmission Properties by Means of the Guarded Hot Plate

C236—Thermal Conductance and Transmittance of Build-Up Sections by means of The Guarded Hot Box

C518—Steady-State Thermal Transmittance Properties by Means of the Heat Flow Meter

C519—Density of Fibrous Loose Fill Building Insulations

C653—Determination of the Thermal Resistance of Low Density Mineral-Fiber Blanket-TYPE Building Insulation

C687—Determination of the Thermal Resistance of Low-Density Fibrous Loose-Fill-Type Building Insulation

C739—Cellulosic Fiber (Wood-Base) Loose-Fill Thermal Insulation

C764—Mineral-Fiber Loose-Fill Insulation

TECHNICAL ASPECTS OF POLYETHYLENE PRODUCTS: RELATING TO CONSUMERS AND STANDARDS

Presented by Tony Zeller, Director of Packaging, Presto Products, Inc.

I am here today speaking on behalf of the National Flexible Packaging Association which has 200 member companies and represents a $4 Billion Dollar industry.

Specifically, we represent the Consumer Plastic Wrap and Bag Group of the NFPA, whose member companies account for approximately 90% or $600,000,000 of the disposer bag sales to consumers through retail outlets in this country. We represent companies from the largest in this field down to some of the smallest. We are here today to address two problems. How to identify and classify the quality of polyethylene disposer bags and film. And, how to economically and reliably measure and verify this quality.

We, as an industry group, are vitally concerned with, and have been taking positive steps to properly solve these problems. We must keep in mind that the plastics industry and polyethylene bags are an extremely young industry.

(Editor's note: At this point, Mr. Zeller began showing a number of slides and a film to illustrate his talk. The following are the narrative highlights of his presentation.)

PAPER TECHNOLOGY—STEEL TECHNOLOGY POLYETHYLENE TECHNOLOGY—Time Line

Modern papermaking technologies go back over 100 years. Modern steelmaking technology, based on the open hearth and Bessemer furnaces, date to the early 1800's.

Polyethylene was developed by the British in 1939 and was used for military purposes until after World War II. Developments originally were from cast extrusion, which we will explain later. Blown Film techniques came into prominence in the 50's; between the 40's and 50's technological developments and resin production over capacity, led to ever decreasing resin prices.

TRASH CAN LINERS—TALL KITCHEN BAGS LAWN AND LEAF BAGS—WASTE BASKET LINERS

This permitted the introduction, in the late 50's and early 60's, of consumer disposer bags as we know them today. Inexpensive

enough for everyone, functional, sanitary disposer bags, save the consumer and the taxpayer money through more efficient waste collection.

We can see that polyethylene disposer bags are a very recent phenomenon. The total technology of blown film is less than 40 years old. The majority of the companies represented here today have been manufacturing blown film for less than 20 years.

WHY IS THIS IMPORTANT?

It is important because we are dealing with a product.

A PRODUCT WHOSE MANUFACTURING PROCESSES & RAW MATERIALS (RESIN) ARE CONTINUALLY CHANGING/IMPROVING RIGHT UP TO THE PRESENT

We will continue to see technological advancements in the future, which will be to the customer/user's benefit *if* we do not set up arbitrary and misleading "quality" measurements for the consumer to purchase by.

POLYETHYLENE RESIN REACTOR

It is important to keep in mind that our basic materials here (resins) are made from petroleum or natural gas—increasingly costly and increasingly scarce. The petrochemical industry, however, consumes less than 6% of all energy used in the United States from natural gas or oil. The proportion going into consumer disposer bags is about $300,000,000. It is important to note, however, that this amount is 300% higher than 4 years ago, but the number of pounds used is only up 40%.

Clearly, the fuel cost increases have had a serious effect on the disposer bag industry.

QUESTION: ARE WE STILL ABLE TO PROVIDE FUNCTIONAL, SANITARY, CONVENIENT DISPOSER BAGS AT A REASONABLE COST THAT EVERYONE CAN AFFORD?

This is a question that is of foremost concern to many in this industry. Four years ago, the resin made up 47% of the manufacturers selling price. Within the past 4 years resin costs have increased substantially. Despite these increases, the industry continues to provide a low cost product due to the efficiency of our manufacturing techniques—more automation, higher output per direct labor dollar, better utilization of our process scrap materials. Now—let us return to our original problems and tackle them one at a time!

HOW TO IDENTIFY AND CLASSIFY THE QUALITY OF POLYETHYLENE DISPOSER BAGS AND FILM

We must establish a common understanding of typical manufacturing processes to evaluate quality contributing criteria. The primary process of consumer polyethylene disposer bags manufacturing is what is known as a blown film process.

BASIN BLOWN FILM LINE

In the extruder, the resin is heated to a melted fluid state. The color concentrate or other additives are mixed by shear mixing and the melted resin is forced out of a circular opening in the die. The melted polymer is formed to its circumference by a controlled air volume inside the bubble. The thickness is determined by how fast the upper nip rolls pull and stretch out the melted polymer. The rate of cooling is determined by the temperature and the velocity of air coming from the air ring. After the polyethylene is formed and cooled, it is conveyed either to a winder for later conversion to bags, or directly to a bag making machine for conversion from tubing to bags for consumer use.

CAST EXTRUSION

The cast process is also used for the manufacture of thin films for consumer plastic wrap. The primary difference here is that the melted polyethylene flows out of a long slot die on to a chill roll and is cooled upon contact with this roll rather than being cooled by air blowing around the film as in the blown film process.

Let us look at some of the things affecting product quality:

NEW DEVELOPMENTS

There are many variables that affect end quality of the product. Perhaps the most important thing to keep in mind today is that there are many new developments on the horizon and many new developments are becoming realities today in this industry. New resins are being developed which will give superior properties at lighter gauges (less thickness). Some of these are: EVA; lower melt index resins; polybutylene; polypropylene; high density polyethylene; co-extruded HDPE and LDPE films.

Other developments will allow the extension of these scarce resources (petroleum made into plastics) by use of extenders. While their primary uses will be in thicker molded products, developments to-date indicate progress is being made to make better polymer adhesion to the fillers and extenders so that rather than

being "foreign particles", they become bonded into the material much as the stone aggregate is bonded into concrete.

EXTENDERS

The weight of extenders varies considerably as shown in this example:

Weight for 10 count roll of 30″ x 37″ (30 gallon) 1.5 mil trash bags=

1.10 lb—LDPE (clear)

1.14 lb—LDPE + 6% green color concentrate

1.27 lb—LDPE + 6% white pigment

1.31 lb—LDPE + 6% white pigment

Now the weight variation goes from low density polyethylene with 15% starch or wood flour extenders weighing .96 lb to low density with 15% clay extenders weighing 1.26 lb.

COLOR CONCENTRATES

The industry currently uses fillers for coloring the film—the color concentrates per unit volume are considerably heavier than the base resins. The more opaque the color of the bag, the heavier it will weigh. However, beyond a fairly low percentage level, the color concentrates can adversely affect strength. Also, there is a weight difference between the various colors due to the different minerals and components used to get the color.

PRODUCT QUALITY

The "quality" of polyethylene film products is a complex matter. Gauge *does not* tell the strength of alternate resins, manufacturing techniques, et cetera, nor does gauge tell if there are any other performance areas likely to fail. Also because of the many resin, color concentrate and filler combinations available, *weight* is *definitely not* a measure of quality but only of the *volume* of materials used in manufacture. Thicker does not mean better if it results in waste.

THE ORIGINAL PROBLEMS

How then can we answer the two questions or problems originally proposed?

Clearly, the most suitable way to identify and classify the quality is through performance standards.

We, as an industry group, have already accepted the gauge requirement on retail consumer packaging as an interim product dimension measurement of limited benefit to the consumer. The enforcement of this item requires sophisticated equipment and a complete, statistically valid sampling procedure.

PROPOSED SPECIFICATION AND TESTING PROCEDURE

The Consumer Plastic Wrap and Bag Group has proposed such simplified, yet statistically valid, procedures at the interim meeting of this organization and to the National Bureau of Standards. We feel this proposal is a practical and more accurate modification of the California testing procedure.

We believe, however, that working together, we can come up with better regulations which will inform and protect the consumer and, at the same time, be equitable to all size manufacturers and most important to you, be easily regulated and enforced by state and local weights and measures personnel.

The National Flexible Packaging Association through the Consumer Plastic Wrap and Bag Group has been addressing this problem for the past 18 months. We have a proposal which incorporates:

1. Uniform method of determining bag capacity.
2. Standard gradings (light duty, standard duty, heavy duty) based on the capacity of each bag.
3. Performance tests to validate the bag grading. These tests will check all aspects which relate to the performance of the bag—resin type, manufacturing conditions, seals, gauge uniformity, et cetera.

TEST MEDIUM

We are working on a manufactured, controlled testing medium which will be consistent, clean and economical. We are at a point where we would propose a joint effort by representative of the National Conference on Weights and Measures, The National Bureau of Standards, The National Flexible Packaging Association and other affected and interested extruders to work out the procedural details, inspection, sampling, et cetera of our simplified test so that it will be easily adaptable to the inspection and laboratory facilities which the weights and measures people have available on a state and local level.

CONCLUSION

In the spirit of cooperation, we feel that the mil thickness can be put on retail consumer bag packaging as an interim measure of limited value to the consumer.

Weight may be necessary for commercial or industrial plastic items, but we feel it will be a misleading indicator of quality on retail consumer disposal bags and food wrap film and, thus, should not be required.

We propose, however, that a joint effort be made to conclude the work of the NFPA—CPW & BG and present a final workable regulation to the interim meeting for next year's agenda. This regulation will cover: (1) bag capacities, (2) grading standards and, (3) performance tests to validate grades.

Thank you for this opportunity to inform you as to the nature of the manufacturing processes and the true product quality criteria.

METRIC PACKAGING EXPERIENCES IN CANADA

Presented by ALLEN R. CHADSEY, Director, Packaging Services, George Wetson Company, Ltd.

"The substitution of an entire new system of weights and measures instead of one long established and in general use is one of the most arduous exercises of legislative authority.

"There is, indeed, no difficulty in enacting and promulgating the law, but the difficulties of carrying it into execution are always great and have often proved insuperable." John Quincy Adams (1821)

I've been asked to speak briefly on "Metric Packaging Experiences in Canada". Rather than relating tales of specific incidents—good, bad and amusing—I plan, instead to pass along some of my own general impressions and metric lessons learned so far.

By way of background, you may recall that in Canada there is no Metric law, as such. In 1970 our federal government published a metric "White Paper" which led to adoption of a national policy and the establishment of a METRIC COMMISSION to coordinate metric conversion in all sectors of the economy. By 1973 there were 11 steering committees guiding national associations, government departments and agencies in an overall program for the planned conversion of Canada society to the metric system of measurement. The resultant SECTOR PLANNING exercise is still going on through more than 100 sector committees representing single industries, related groups of industries and non-industrial activities as defined by the Canadian Standard Industrial Classification Manual. The consumer products industry and, more especially, food companies—(the basis of my remarks today)—have been active in this organization from the beginning.

Early on—as we began to approach the conversion of prepackaged food and grocery products it became apparent that for planning purposes we needed committees that shared the same units of measurement. A common trade arithmetic, and not industrial classification, became the criterion for sector and subsector grouping. Where, at the start, there had been fewer than fifteen planning groups identified, this number soon rose to more than 25. In the dairy sector alone, it became expedient to have separate subsectors for cheese, butter, evaporated and condensed milk, ice cream, and fluid milk. In one industry—5 different sets of measure-

ment units. So much for original good intentions to restrict the number of committees.

Besides grouping arithmetical likes with likes it was discovered that there is a need to be very clear in identifying exactly what is being discussed at any given time. Metric Practice? Preferred sizes? Standardized sizes? Standard conversion? Four distinctly different subjects the indiscriminate mixing of which is guaranteed to hopelessly confuse and prolong most metric meetings.

Having organized for the task it was not long before we realized that our real problem was not one of changing things and practices to metric—not at all—that part is comparatively easy. For tnose who make and sell consumer goods the real metric conversion is in changing people. Indeed this may well be the toughest and, to the entire metric exercise, the most important task of all.

It starts with selling the idea.

Not easy. It's tough to peddle a problem. And it's even tougher when there are no apparent benefits in the near term.

It should come as no surprise that most people don't welcome metric conversion. There's no need for surveys to learn that. Of course the response to questionnaires—yes or no for metric—will be negative. Anything else would assume metric knowledge and favorable metric experiences, both of which are not yet within the ken of most people. On that note—there is, however, one survey you might try. Instead of quizzing the man-in-the-street, ask some school kids, who know that they have been rescued from vulgar fractions, whether or not they approve of the metric system.

Apart from the people—many companies, without the incentive of immediate profits, aren't that keen about metrics either. It's easy to see why. Last April at the Grocery Manufacturers of America Metric Orientation Seminar in Chicago I suggested that metrication was similar to that TV series *Mission Impossible* and asked them to imagine an episode that starts: "Your mission, should you choose to accept it, is to take a proposition:

WHICH most of your customers don't think they need——don't want—and aren't asking for;

WHICH lacking political appeal, sometimes seems to have been disavowed in high places;

WHICH is under fire by small businessmen and big labour alike;

WHICH offers your company few, if any, tangible benefits with many headaches in the short term;

WHICH in the absence of knowledge and understanding, is often perceived with hostility in the marketplace as another rip-off.

Your mission, as an industry, is to march in the front rank—taking this proposition to people who, on the strength of some emotionally unappealing arguments, are being asked to abandon life-long habits with which, for the most part, they are well satisfied and quite happy.

Sounds like a kamikaze briefing. And yet it doesn't really overstate the people changing challenge of metric conversion. Nor does it overstate the industry role—when you consider that, in America, food markets, where, almost daily, the public use measurements of length, weight, volume and temperature, will be metric classrooms for most of the people.

The fact is that general resistance to metrics is so great and so widespread that even with strong, visible government support, conversion will be difficult and without it—virtually impossible. But, as we've learned in Canada, the proposition has little political appeal—except for those on the attack and, it seems, there are plenty of them. Despite our 1970 White Paper, national policy and all-party agreement in principle there seems to be little political accord with our 1977 Metric conversion activities. Most recently attempts to pass a bill facilitating metric conversion by amending a series of federal statutes brought forth opposition charges that the whole thing is a conspiracy by middle-level civil servants; that measuring grain by kilograms per hectare instead of bushels-per-acre is a threat to our Canadian heritage; that conversion plans were badly communicated and that people were never given a chance to debate the issue one way or the other.

"Methods being used to advance implementation of metric measures are repugnant and a repudiation of the democratic process" are the words of one critic who says that in Canada an attempt is being made to sneak through the back door by nailing down the professional groups first and then presenting the public with a fait accompli. Well, it must, I suppose, be admitted that his final allegation is essentially correct. In Canada, it is true that the public at large is being approached for metric conversion purposes through their trade and professional groups. And it is true that the consensus findings of such groups in their final form do smack of fait accompli, although they can be and frequently are challenged and changed. The question is—having decided to 'go metric'—(as, presumably, we have done)—and remembering the saying that—'nothing will ever be accomplished if all possible objections must first be overcome'—how then (short of consulting, individually, a largely disinterested and uninformed populace)—should the negative proposition of metric conversion be planned and implemented? One thing is certain—you can make speeches, issue pamphlets, write letters, run ads and hold meetings without really reaching the public-at-large. It seems that for most people

metric awareness and learning has to be experiential. Despite all attempts at prior communication it is only when a metric change actually occurs that you get widespread attention and then, unfortunately, it's usually hostile and well publicized for the wrong reasons. All of which makes it quite apparent that metric conversion must be supported by a government resolve sufficient to withstand inevitable public resistance. Whether the amount of government suasion necessary to implement metric conversion impinges on the idea of voluntarism becomes the next question.

Is it possible—using a purely voluntary approach—to effect a fast, clear cut conversion to pure metrics? Can metric proponents, through convincing advocacy and compelling leadership succeed in making the idea of conversion so fashionable and so desirable that today's adversaries will be won over? My guess is that there will have to be both bait and prod. Both the carrot and the stick.

Without guidelines for style and ground rules for compliance we face the prospect of a prolonged, muddy, hotch-potch of two measurement systems. All of the problems and none of the benefits.

In this context it must be admitted that in the area of prepackaged products a good deal of the Canadian progress to date is due to a Consumer Packaging & Labelling law that made the addition of a metric declaration mandatory as of March 1, 1976. It was this deadline that, in effect, put an end to some of our early metric debates and got things going. However, in retrospect, this has proven to be a mixed blessing because it has fostered dual declaration which many authorities reject as a disincentive to metric thinking. Dual declaration with customary and metric units side by side, although defended by some as necessary (at the outset of metric conversion) for purposes of public reassurance, is seen as encouraging 'conversion', prolonging the learning process and adding to costs.

Canada, as a late starter in the metric race, was handed the opportunity to profit from the experience of other countries and to avoid some of the well marked pitfalls. For instance—we didn't need to entrench dual declaration as a practice by writing regulations to make it mandatory. However, in fairness it must be noted that the current bill now seeks to undo this earlier legislation. We might, as well, have heeded Australian admonitions and done a better job of coordinating metric introductions (particularly where the price of a product was affected) between manufacturers and retailers. We might have been spared the 'rip-off' accusations that accompanied replacement of five pounds of sugar with 2 kg of sugar. A 12% reduction in net quantity without a 12% reduction in price. Subsequent explanations of pricing structures with unchanged packaging and labour components fell upon deaf ears. This was when the rule—whenever possible, move sizes up and

not down became meaningful. Marketers have also had to learn first hand that it is best to do one thing at a time and, for example, unless you want trouble, don't combine price adjustments with metric size introductions at the same time. Above all, don't be shy about communicating metric plans and schedules.

Tell the consumers; tell the media; tell your related industry sectors and tell the government at every level including the elected representatives. Make sure there are no surprises. It's important to avoid, not only anything sneaky, but anything that may be perceived as being sneaky. To paraphrase the old rule—'tell 'em you're going to—tell 'em you are and tell 'em you did!'

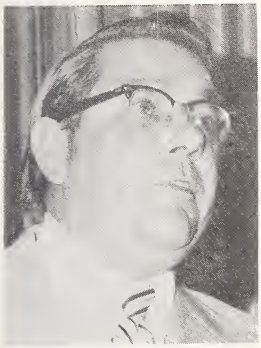
Recently, Canada's Metric Commissioner for food and agriculture observed that our food industry is now at the height of its effort and that the ultimate success of the program seems to be reasonably well assured. Indeed, there has been so much progress in all the sectors that the process of metric conversion in Canada now seems to be irreversible. Even so—there is still much interest in the United States program because many Canadians continue to hope, fervently, that you will emerge as saviours of the status quo, retain your sanity, and not go metric. Maybe, they say, if we hold out long enough this madness will pass and the rest of the world will return to reason and customary units. Once again we can have the comfort of bushels, pecks, arpents, 5280 feet miles and different sized quarts and fluid ounces. They search for signs and portents that you're going to call it off; they take great nourishment from every reported delay and want desperately to believe that the United States 'hasn't started yet'. A situation that might be amusing if this amorphus 'they' didn't include so many supposedly thinking people—some of them in government, some of them business leaders, and many of them in media, who, in the face of the evidence should, by now, have a metric commitment.

Their apparent determination to impede the metric exercise whether for smartness or political reasons borders upon the irresponsible because it is these tactics that will prolong the task, add to its costs and threaten its eventual benefits. Like removing adhesive tape from a hairy chest—the way to go metric is firm and fast. Pull it off cleanly.

The irony appears to be that, with metric conversion, as with so many ventures, the decision to go is half the battle. Once tackled it gets easier and what loomed as huge problems in anticipation tend to diminish and become lesser problems in practice. Costs rarely run as high as expected when people are dragging their feet and looking for ways to hang back. Finally, in the aftermath of metric conversion, those with the experience, almost without exception, report it was no big deal—a non-event really—and that, all along it would have been easier to switch than to fight.

MAIL ORDER SHIPPING PROBLEMS

Presented by WILLIAM KORTH, Director, Weights and Measures and Consumer Affairs, Ventura County, California



There are many areas that Weights and Measures are not too actively involved in either due to lack of time and manpower, because we never gave it any thought, or because we never fully realized how much the transaction really did involve us.

One area we wondered about was the accuracy of shipping charges on mail order and catalog sales, but we never had the time. We were too busy with our routine putting-out-fires inspection. However, thanks to the success of the variable frequency of inspection for devices we finally had some time.

Our initial checks were made in March of 1976. We inspected both receiving and shipping terminals in our county. We inspected several shipping firms by checking packages ready to load that had the charges already determined. We found all charges of weights to be correct as each package had been individually weighed on a certified scale. Spot checks were also made of packages individuals received from mail order houses throughout the country. These were all shipped parcel post or United Parcel. For the most part, the shipping weights and charges were correct. Many of these companies charge a flat rate for shipping based on dollar size of the order.

Next, we started surveying the catalog order stores found in many of the chain department stores. Checks were made unannounced and packages were selected at random, getting a representative sample of the packages on hand including light and heavy ones as well as all the ranges in between. These were then recorded as to store, date, catalog number, item description, billed weight, actual weight, and the money amount. All packages were weighed gross as this determines the amount billed.

Different methods of determining shipping charges were used. Montgomery Ward bill on the actual weight shown in the catalog. Sears Roebuck billed at the distribution center by computer. The stated catalog weight was just an estimated weight. Generally these charges are referred to as shipping and handling charges. Actually the handling is irrelevant as the charge is based on the weight.

To get a representative sample we made more than one inspec-

tion. Montgomery Ward, which has one outlet in the county, was checked six times in a fourteen month period. Shipments are made to the store from Oakland, 330 miles away. Sears Roebuck, which has nine outlets in the county, was surveyed four times in a fifteen month period with thirty-one inspections. Shipments are made from Los Angeles which is approximately 50 to 100 miles away, depending on location of the store in the county.

Chart One was the second inspection we made, approximately one month after the first.

With both Sears Roebuck and Montgomery Ward the findings were very similar to the first inspection. The last inspection made at both establishments was two months ago, May and June, 1977.

Chart Two indicates those findings which are comparable to the previous inspections with Montgomery Ward. As you can see, 60% of the package weights were wrong with 18% being undercharged and 42% overcharged.

With Sears Roebuck the percentage of errors range from 48 to 66.7%. Undercharged from 5 to 28% and overcharged from 20 to 47½%.

Chart Three is a composite of the six inspections made at Montgomery Ward.

Note the percentage of errors in the six inspections and the relationship of the undercharges and overcharges in percent errors and dollar amounts.

As you can see, 172 of the 277 packages checked were in error for an average error of $.249 a package.

Chart Four shows that Sears Roebuck has 10% fewer package errors than Montgomery Ward but 52.4% were in error with an average error of $.168.

Many of the errors were in the 5 to 10¢ bracket. Here are some of the more pronounced errors we found.

Charts Five and Six show there is a problem. What the answer is I don't fully know as there are many factors to consider. With the volume handled by these stores the cost of weighing each shipment individually may not be feasible. To add to the problem, the catalogs are being prepared at least a year in advance.

The company may have several different suppliers for the same item. Over a period of time the packaging material used may be changed and this would affect the weight.

How the companies arrive at the shipping weight represented in the catalog, how often over the life of the catalog they are checked and updated, I don't know.

One catalog has this statement in it: "We determine the shipping and handling rates for packages . . . . . by using the catalog shipping weight as a standard reference. However, these rates have

no direct relationship to the weight of the package when you pick it up.

Through our error or variation in manufacture the weight of the item used in determining the shipping weight may vary from the actual weight. Once this deviation is discovered we make every effort to correct it the next time the item is listed in one of our catalogs."

Another catalog states: "Weight stated in catalog are approximate. We audit and correct the weight regularly."

Another: "Charges are based on catalog weight although they may vary somewhat from the scaled weights."

A critical area is the lightweight packages due to the large money jump on weight ranges. As an example, from 1 oz to 8 oz the charge is 35¢; from 8 to 15 oz it is 65¢ from 1 to 3 lb it is 90¢. As you can readily note, an oz or two error could result in a 30¢ overcharge.

As the weights increase the charges generally go up 5¢ per lb. It should be remembered that these prices are for our area which is very close to the shipping center. The farther your catalog store is from the shipping center, the higher the shipping rates.

What are we talking about? How many packages are shipped each year by these firms? I don't know but I am sure the figure would be staggering.

Projecting our findings for Ventura County alone, on each million packages shipped by Sears Roebuck into the county, 524,000 of them would have an error with $66,976 in overcharges being made, $21,280 in undercharges with a net loss to the consumer of $45,696 in overcharges and $88,256 in total wrong charges.

With Montgomery Ward for each million packages, 621,000 would be wrong with $123,760 in overcharges; $30,876 in undercharges with a net loss to the consumer of $92,884 and $154,636 in wrong charges. The errors, both over and under, would total $242,892 for our county. This total would approximate our yearly departmental budget.

We have approximately 450,000 people in our jurisdiction. This figures out to $.54 per person in wrong charges. Multiply this by the population in your jurisdiction and the results would be staggering.

When we consider that on the total amount of packages checked, those correct and those in error, the average error per package ranged from 9 to 15¢.

There is a problem and I feel we have to move on this. It is not confined only to Ventura County or the State of California. It is nationwide. We need to work with these companies in achieving an amiable solution.

I urge you to run similar surveys in your jurisdiction, and send your findings to the Committee on Laws and Regulations, prior to the interim meetings in January, for their consideration.

CHART 1. *Sears Roebuck and Co.*

Store	Date	Pckgs. Checked	Errors	% Errors	Under-Charges	%	Money Amount	Over-Charges	%	Money Amount
Simi Valley Valley Fair	4/15/76	25	17	68%	5	20.0%	$0.95	12	48%	$3.70
Simi Valley L.A. Avenue	4/15/76	25	11	44	4	16.0	.55	7	28	1.90
Thousand Oaks	4/15/76	28	8	28.6	2	7.1	.80	6	21.4	1.45
Oxnard Saviers Road	4/15/76	39	16	41.0	5	12.8	.50	11	28.2	2.36
Camarillo	4/15/76	50	24	48.0	4	8.0	.60	20	40.0	3.70
Ojai	4/15/76	22	13	59.1	5	22.7	.45	8	36.4	1.15
Santa Paula	4/15/76	14	7	50.0	2	14.3	.35	5	35.7	.80
Ventura	4/15/76	40	11	27.5	6	15.0	1.15	5	12.5	.71
Oxnard Esplanade	4/16/76	50	19	38.0	7	14.0	.60	12	24.0	1.75
Totals of 9 stores		293	126	43.0%	40	13.7%	$5.95	86	29.4%	$17.52

Store	Date	Pckgs. Checked	Errors	% Errors	Under-Charges	%	Money Amount	Over-Charges	%	Money Amount
Montgomery Ward-Ventura	4/9/76	53	28	52.8%	10	18.9%	$2.54	18	34.0%	$4.37

CHART 2. *Survey—Shipping Weights. Montgomery Ward and Sears Roebuck*

Est. & Date	Total Pckgs. Chckd.	No. of Errors	% of Errors	Under-Charges	%	Money Amount	Over-Charges	%	Money Amount
M. WARD	50	30	60%	9	18%	$1.80	21	42%	$7.40
SEARS									
S. Valley Valley Fair 5/23/77	25	12	48	7	28	1.10	5	20	.85
Camarillo 6/3/77	30	20	66.7	6	20	.80	14	46.7	2.70
Oxnard Saviers Road 6/15/77	40	20	50	2	5	.15	18	45	3.70
Thousand Oaks 6/15/77	40	25	62.5	6	15	.60	19	47.5	3.60
Totals	135	77	57.0%	21	17%	$2.65	56	40.0%	$10.85

CHART 3. *Survey—Shipping Weights. Montgomery Ward and Co.*

Date	No. of Stores	Total Pckgs. Chckd.	No. of Errors	% of Errors	Under-Chgs.	%	Money Amt. $	Avg. Pkg. $	Over-Chgs.	%	Money Amt. $	Avg. Pkg. $
3/12/76	1	23	16	69.6%	2	8.7%	$0.10	$0.05	14	60.9%	$3.80	$0.271
3/19/76	1	48	33	68.8	7	14.6	1.44	.206	26	54.2	7.34	.282
3/25/76	1	53	32	60.4	10	18.9	1.69	.169	22	41.5	5.70	.259
4/9/76	1	53	28	52.8	10	18.9	2.54	.254	18	34.0	4.37	.243
8/19/76	1	50	33	66.0	8	16.0	1.00	.125	25	50.0	5.60	.224
5/21/77	1	50	30	60.0	9	18.0	1.80	.20	21	42.0	7.40	.352
Totals		277	172	62.1%	46	16.6%	$8.57	$0.186	126	45.5%	$34.21	$0.272

Total	1 store 6 checks
Loss	$42.78
Errors	172
Correct	105
Average Error	$0.249

CHART 4. *Survey—Shipping Weights. Sears, Roebuck and Co.*

Date	No. of Stores	Total Pckgs. Chckd.	No. of Errors	% of Errors	Under-Chgs.	%	Money Amt. $	Avg. Pkg. $	Over-Chgs.	%	Money Amt. $	Avg. Pkg. $
3/76	9	233	132	56.6%	51	21.9%	$6.55	$0.128	81	34.8%	$11.70	$0.144
4/76	9	293	126	43.0	40	13.7	5.95	.149	86	29.4	17.52	.204
9/76	9	486	266	54.7	71	14.6	9.25	.130	195	40.1	36.70	.188
6/77	4	135	77	57.0	21	15.6	2.65	.126	56	41.5	10.85	.193
Totals		1147	601	52.4%	183	16.0%	$24.40	$0.133	418	36.4%	$76.77	$0.184

Total	9 stores 31 checks
Loss	$101.17
Errors	601
Correct	546
Average Error	$0.168

CHART 5. *Some of the More Pronounced Errors in Survey . . . Montgomery Ward*

Date	Item	Catalog No.	Billed Weight	Actual	Money Amount
8/19/76	Spread	18L6210W	13-0	7-15	$0.55
8/19/76	Luggage	60L90176TG	22-0	17-14	.45
3/19/76	Fireplace Set	83A7205	19-0	11-6	.81
3/19/76	Corner Filler	74S60490	10-0	3-0	.68
4/9/76	Vacuum Cleaner Bags	82A930	5-0	15 oz	.71
4/9/76	Curtain Fit	61A59717	6-0	1-6	.35
4/9/76	Dry Vacuum	84A5363M	21-14	16-0	.81
3/25/76	Rafter	89FX4015W	24-0	8-9	1.55
3/12/76	Runner	72A792AH	26-0	19-1	.68
5/23/77	China	77E17005MM	59-0	46-6	.60
5/23/77	Light	77J1899M	14-0	8-11	.50

CHART 6. *Some of the More Pronounced Errors in Survey . . . Sears Roebuck and Co.*

Date	Item	Catalog No.	Billed Weight	Actual	Money Amount
3/22/76	Hamper	96K6190	15-0	8-8	$0.45
3/16/76	Saw Stand	9-22204	52-0	86-12	+1.35
3/16/76	Music Instrument	15-13271	15-0	6-12	.60
3/16/76	Swag Lamp	7803	15-0	6-15	.60
3/16/76	Metal Cabinet	44418	42-0	35-8	.40
3/24/76	Lamp	7776	15-0	5-7	.65
6/15/77	Cork Panels	64HX0625	22-8	13-4	.65
6/15/77	Bolster Cover	24T25073LH	15-0	5-3	.65
6/15/77	Pool Cover	42J4480C	14-0	6-3	.50
5/23/77	Swag Lamp	21A7803L1H	15-0	7-1	.50
9/13/76	Cabinet	9TR65355	12-0	6-15	.35
9/13/76	Traverse Rod	24M9102	15-0	5-14	.65
9/14/76	Sprinkler	9K79009	54-0	46-15	.50
9/14/76	Camp Cot, Umbrella, Tent } Combination	6H72628 6H77223	46-0	30-12	1.05
9/14/76	Night Stand	1H92324	9-0	14-9	+ .45
9/15/76	Medicine Cabinet	423865	25-0	17-5	.50
9/15/76	Quilt Frames	25H48184	13 oz	9-6	+ .85
9/15/76	Poly Cushions (2)	24H87555L	30-0	9-10	1.40
3/25/76	Aluminum Door	23975	54-0	44-11	.60
4/15/76	China	2145671	14-0	19-7	+ .45
4/15/76	Tent	6T77181	55-0	38-6	1.15
4/15/76	Lamp	21K7797	15-0	8-15	.45
4/15/76	Lamp	21T7747	15-0	6-6	.60
4/15/76	Wheel Covers	28K200139C	15-0	25-9	+ .75
9/9/76	Folding Doors	64H73244N-1	38-0	29-4	.55
9/9/76	Light Fixtures	34H8418L1	18-0	11-15	.45
9/9/76	Wheelbarrow	9Y87874	64-0	57-0	.50

MORNING SESSION—TUESDAY, JULY 19, 1977

(KENDRICK J. SIMILA, *Vice Chairperson*, Presiding)

NEW HORIZONS IN METROLOGY

Presented by EARL PRIDEAUX, Conference Chairperson, and Chief, Weights and Measures Section, Department of Agriculture, State of Colorado

I am and have been for a year, very grateful to the Nominating Committee for the trust, honor and privilege of serving as your Chairperson of the 62nd National Conference on Weights and Measures.

On October 18, 1976, Mayor Robert Folson of Dallas extended Greetings to Harold Wollin and Earl Prideaux to appear before the City Council of Dallas for the purpose of appointing us as Honorary Citizens of Dallas. I appeared first before the Council; so, I have the seniority and honor to very officially welcome y'all foreigners to our great city and the 62nd National Conference on Weights and Measures.

Our official Dallas hosts, Charles Vincent, and Jim Blackwood have really gone all out for our Conference. For over a year, these two, and others on their staffs have helped with detailed planning, and have really proven that Dallas was a great location for this Conference.

The many challenging, the many new and interesting presentations at the Interim Meeting led to the theme of our Conference "New Horizons in Metrology." Webster includes in his definition of "horizons" the words sensible, rational, apparent, and visible. For the many new horizons that will be presented at our 62nd to be effective nationally, we must use all of these adjectives.

The 62nd National Conference on Weights and Measures is calling on all Weights and Measures Jurisdictions, all Industry and all Manufacturers' representatives to come together in a bond of closeness and desire for uniformity and improvement. If we do, when the Conference adjourns on Thursday, each of us may say—I have done my best to make this an outstanding Conference.

As Chairperson of the Conference, I chose as my subject: Cooperation and Communication and a Few Specifics . . . . .

It is my intention to be objective and I ask that you please accept the "specifics" with understanding for I am deeply concerned for us all to cooperate in a spirit of uniformity. I have conversed

with several jurisdictions that are involved with the specifics and we agree that differences should be resolved.

I personally feel that the State of California is one of the most influential states in our Conference. It has over 50 county jurisdictions (several that are larger than my State of Colorado). California has many scale manufacturers and distributors, many scale service companies, and many commercial packers. California has a large number of Weights and Measures personnel and many state and national Weights and Measures leaders. California participation is most important to the Conference; the Conference leadership is most important to California.

I attended the California Weights and Measures Conference in Sacramento. The leadership was most impressive. What impressed me most was the cooperation between counties and the desire to cooperate with the National Conference. We all know we have had differences of opinion on type approval tests, procedure testing of pre-packaged meat and some variances in volumetric testing. In California, I felt the desire for us all to be uniform—for all Jurisdictions to call 16 ounces a pound.

For the past ten months, I have watched, listened and sometimes participated in controversial subjects such as the voting structure, type approval testing program, wet and dry tare, and volumetric testing as to contain or to deliver.

We have learned from the Rath bacon and flour industry Supreme Court cases that we must be uniform and we must assist each other to make our bond closer, to communicate with each other all the time and to let our views be known.

What happens when you are on a committee and send out for information? You get about 60 percent response. What happens when the Editor of a regional newsletter requests input? About 41 percent respond. What happens when we have national interest information and no personnel to edit the Tech Memos? There is no out-put and we all suffer. We must get our act together!

During the past year, I have received many communications. Many with suggestions on how to solve or partially solve problems like the voting procedure, which will be presented at this Conference. Suggestions on how to improve the H-67 re-write and what the Supreme Court decision on the Rath bacon case really means. Suggestions on tolerance changes for belt conveyor scales, and a separate HB-44 code for railroad track scales. All were in the spirit of cooperation to increase the effectiveness of our National Conference on Weights and Measures.

Communication is the very heart of our Weights and Measures program. Our Newsletters have been so vital in our communications. During the past year, we almost lost two, and maybe more,

of our regional and state Weights and Measures Newsletters because we have not contributed sufficient material.

When Bob Williams asked for comments as to continuing the Southern Newsletter, he received some good comments, even suggestions on how to improve. Mr. Dettler has requested the same information for the Western Newsletter. Det wrote me a short time ago saying he even thought of putting out a "blank"; maybe, we would get the message.

I recently received two excellent papers on subjects concerning all of us: "National Type Approval" written by Bill Goodpaster, Murphy-Cardinal Scale Company; and, "Specifications for Packaging, Testing Against Declared Net Weight" from Harry Couden, Safeway. I think both should be printed in regional newsletters, so all could get a chance to make comments.

During the past year, we have generated tremendous interest in several important subjects. Let us continue our interest and involvement. I have checked back on the regional newsletters and I found the major contributors are the same people that answer requests, the same people that get involved. I realize we cannot all be John O'Neill's! However, we can sure try to follow his example.

Weights and Measures Jurisdictions test mass, volume, and length with known standards. Why cannot the test procedures be the same? Why can't we agree on wet or dry tare? Why can't we all agree to measure to contain or to deliver? Industry is confused in their interstate shipments. We use known standards for testing; let us have uniform standards all the way.

Weights and Measures Jurisdictions are now facing a period of time that challenges their operations. I honestly believe we are just at the beginning of tension-time and nerve-testing-time; a time when we must bring all our cooperation and communications to one common cause.

Our budget cuts are hurting. Courts are testing us. We must be uniform.

In the Foreword of the Model State Weights and Measures Law 1976, it reads in part . . . "Through the years, almost without exception, each State has relied upon the Model Law at the time it first enacted comprehensive weights and measures legislation. This has led to a great degree of uniformity in the basic weights and measures requirements throughout the country."

I agree in part. However, the States have not kept their laws current by adopting changes regularly.

Checking through the Soap and Detergent Association's compilation of State Weights and Measures Laws and Regulations put out in 1969, I find many jurisdictions have about the same statute as it relates to "POLICE POWERS"—giving officials special police

powers to arrest, without formal warrant, to seize for use as evidence without formal warrant, etc."

I doubt that many have used the arresting authority. But, many of us used the statute to "place off-sale" merchandise found with incorrect weight or incorrectly labeled. I am now told by the Colorado Attorney General's office that our State statute is unconstitutional. I lost my authority to "place off-sale." It will take at least a year for new legislation. Fortunately, the Model Weights and Measures Law-1976 is constitutional.

I bring these specifics to you to emphasize that we are facing a period of technical points, not the spirit of the law.

It would be the greatest thing ever, if all jurisdiction could agree on the method-of-sale of all commodities and that the National Conference L & R Committee could research all L & R final reports, update all changes and publish a National Method-of-Sale of Commodities Handbook. What a wonderful benefit to industry on intrastate, interstate, and international shipments. It is possible and I urge further consideration.

Our Weights and Measures communications and publications must be increased during the coming years when we face these serious problems. We can bring the information before members by use of the Newsletters, Tech Memos, or similar publications.

For instance, we are facing all sorts of fraudulent activity in the insulation business—short weight and measures, improper materials, deceptive labeling of the product, etc. If Government pays home owners for using insulation, we must be sure proper quantities are sold. A united approach by Weights and Measures officials can control the situation.

Ladies and Gentlemen, we should have a great Conference this week. Outstanding speakers, timely subjects, and many important committee presentations. Presentations that represent many hours of work and many hours of technical research. I sincerely hope you have and will give serious study to the issues.

The committees intend to arrive at a decision on each item. Some items like the voting procedure and tolerance changes for belt conveyor scales are to be discussed but will not be voted on finally at this conference.

For us to continue the importance of our National Conference, the printout has to be conveyed to the important people, the fieldmen, and the ones who will put the decisions in motion come January 1, 1978. It has to be put out in some fashion of explanation. This determines the ultimate success of our program; again, communication. The industry groups that are disseminating the S&T final reports to your field people are to be commended.

Communication channels to our associates in industry and busi-

ness must be increased. It would be most foolish, if we were to underestimate or neglect these contacts. I personally know of no scale or meter manufacturer, business or service company unwilling to cooperate or, most important, lend assistance.

As the measuring devices and the weighing systems become more complicated and as interfacing increases, Weights and Measures personnel and industry people will need to work more cooperatively to correctly and accurately make decisions.

When Ez Delfino gets his task force on type approval in full gear, I think the reliance and expertise needed to determine whether a new type device will be a Lincoln Continental, Edsel, Cadillac, or a Corvette will be based on proven experience and sound technical criteria.

A mutual trust based on experience and integrity must continue to be developed between device manufacturers and enforcement officials. We urgently need to develop a system of cooperation and communications that will reach from state to state.

We could all learn a lesson in communication and cooperation by just watching Jim Blackwood's staff, Jamie West, and the rest of Charlie's Angels in action here in Dallas.

The Kid from Idaho, Lyman Holloway, always has trouble following my conversation, if over a minute long or a couple paragraphs; he says I get on tangents and double talk. So, I will not go into my thoughts about Federal Agencies pre-empting State Agencies with less stringent laws and, in most cases, not have the personnel to enforce the ones they have. I will just hope that city, county and state jurisdictions lay the ground work for total regional representation and then unify for a 100 percent effort to achieve nationwide uniformity.

One more tangent . . . I want to read an excerpt from a speech by a past conference chairman, Mr. C. M. Fuller (then County Sealer of W&M LA County) at the 44th National Conference in 1959. Quote . . . "A new arrival at the 26th National Conference in 1936 was W. S. Bussey, Chief, Division of Weights and Measures for the State of Texas, who came with a bodyguard of four comely young ladies, one of whom, I hasten to add, was his wife. He displayed real showmanship when, on behalf of the Governor of Texas, he presented Dr. Briggs, Director of the National Bureau of Standards and President of the Conference, with a Commission as Honorary Texas Ranger and as a badge of office—a Ranger's ten-gallon hat. Not satisfied with that, the following year he brought back three of his co-workers, all big Texans, wearing enormous Mexican strawhats with tassels around the brims and loud sarapes thrown nonchalantly over their shoulders to complete the outfits. From that time on . . . everybody knew Bill Bussey!"

Precedents are for Chairpersons only. I set this rule as I am the first Chairperson of the Conference. I'll leave that alone . . . you leave it alone.

I recently received a very sincere letter from a man dedicated to Weights and Measures. A man who could stir you and a man that would make you think. Mr. Max Trujillo from Puerto Rico said to say "Hi y'all." For political reasons, he is not with us today.

In our associations, we meet many very wonderful people. People that leave a lasting impact. We have two great, wonderful people with us today that have done this to many of us, Council and Mildred Wooten. Mildred taught music for 28 years at Kate Sullivan School in Tallahassee. Mildred and music are synonymous. In her class room, she had a sign which read "There is Magic in Music." Mildred proved that music was helpful to children who have trouble reading or have to read fast to keep up. Council soon retires. We know Council as a very knowledgeable and outstanding leader in our Conference. Council has contributed so very much to our Conference. Mildred and Council may well be proud of their accomplishments to their City of Tallahassee, their State of Florida, and to the Southern and National Conferences. Happy Active Retirement!

Most Chairpersons start out with a routine thanks to Mr. Harold Wollin and his OWM staff for all their help. I did not; it's his and their job to be efficient, to make the Conference the best organized, with the most outstanding speakers, and smooth running all the way. It has been a year of continuous contact and a year of many discussions. I respected Harold's position and he respected my position with the Conference. I have never met or worked with a more patient, more courteous, more understanding, more stubborn, or more set individual. His greatest concern, outside of the Conference efficiency, is his worry of hurting a person's feelings. We were compatible on that score.

Mr. Wollin, you made it a very enjoyable year!

CRITICAL PATH FOR HANDBOOK 44 METRIC

Presented by Otto K. Warnlof, Manager of Technical Services, Office of Weights and Measures, National Bureau of Standards

It's a pleasure for me to have the opportunity to discuss with you my ideas for the development of metric standards for the design and performance of commercial weighing and measuring devices and systems.

As most of you know, I've been involved in weights and measures programs, in one way or another since 1949, and quite soon recognized the many advantages of the metric system of measurement. However, it seemed to me that this view was shared by only a few and for the next 20 years or so there was little apparent change.

In the early seventies a change did take place and what seemed unbelievable to me just seven years ago now appears to be a reality. That is, the U.S. will be predominently metric before I retire ten years from now.

It is not necessary for me to name those U.S. businesses and other organizations who are dedicated to a change to metric, for the Office of Weights and Measures, the American National Metric Council and many others have done a good job of keeping you informed.

This change became more than words and really hit home to me several weeks ago when Irene and I went shopping for a new automobile. During our tour, while opening and closing the car doors to hear that deep clunk, indicating strength and precision, I noticed that when the doors were opened, the frames were almost as well finished as the cars gleaming white exterior, with the exception of several hinge bolts, the heads of which were blue. I remarked to the salesman that on the finest luxury car in the U.S. one would expect everything to be color coordinated and that on a white car with a white leather interior those blue bolts were obnoxious. He then informed me that those blue bolts were metric and they then became quite beautiful. On further inspection we discovered a large number of blue bolts, especially under the hood. We finally purchased a blue car. This was my first visible evidence of a significant change to metric.

A catalyst for change is necessary, and for those companies and industries already changing, that catalyst, I suspect, is economics. However, as it has been in every other country save one, when

converting to metric the last frontier is always the commercial measurement system.

It is difficult to visualize any economic advantage in selling ground beef or butter by the kilogram rather than the pound. This may not be true in the retail sale of petroleum products, for I'm certain economic advantages in this industry are clearly evident and real to any company, providing they maintain what they consider their share of the market. But, the market researchers have indicated that a change to metric measurement can result in a decrease in sales.

For these and certain other factors, it is my view that congressional action will be necessary to bring about a change to metric in the commercial measurement system.

This preliminary discussion has been to indicate to you, that although the need for metric specifications is somewhat urgent, a crash program is not necessary.

There are other reasons . . . many U.S. manufacturers of commercial weighing and measuring devices presently manufacture both U.S. customery and metric equipment. A gas pump manufacturer makes pumps that indicate measured quantities in U.S. gallons, imperial gallons and liters. A scale manufacturer manufactures a computing scale that indicates in 0.01 lb units or 5 gram units and computes prices on the basis of dollars, new pence and pounds, francs, deutschemarks, kroner, lire and centavos. (Ten slides were shown of metric equipment in Denmark, France, Germany, the Netherlands, Norway and Sweden.) Consequently, many, if not most, U.S. weighing and measuring device manufacturers are familiar with the metric system, and market equipment in countries where this system is in use.

Several years ago, when the National Conference on Weights and Measures and the Specifications and Tolerances Committee began discussing metric provisions for Handbook 44, it was my view that we were moving too fast. I viewed this change as a chance in a lifetime, perhaps the chance in a century, as indicated in the theme of last year's Conference, "Metrication—A One Time Opportunity." This was a whole new opportunity, new horizons—and a time to review. Without clear evidence that this was the proper path, I recommended that a soft conversion was inappropriate, that to change, .008″ to .2032 mm or 45 mph to 72.4 km/h was not meaningful and a new Handbook 44 be produced, directed only to metric equipment and called Handbook 44M or Handbook 44S.I. Since that recommendation, there has been a great deal of activity with respect to Handbook 44M, and many people have offered comments, many have volunteered to produce Handbook 44M,—some have indicated it is their responsibility. The response has been tre-

mendous and most gratifying and appreciated. And, fortunately, most all of those volunteers will participate in the development of these metric specifications, and many others as well. In the same way that design and performance specifications for weighing and measuring devices have been developed so successfully for the last 50 years, through the National Conference on Weights and Measures.

Let me now offer to you what I view as critical considerations and necessary decisions to be made in the development of metric specifications and a path to follow to this end.

We can change certain codes quite simply. The Specifications and Tolerances Committee in its report to this Conference, has offered to you for your action a Code for Taximeters and a Code for Odometers, incorporating requirements applicable to both U.S. customary and S.I. equipment.

The Berry Basket and Boxes Code can remain as it is presently and a new code can be written to apply only to S.I. equipment by simply changing those paragraphs. Specifically in Paragraph A.1. delete the term "dry quart" and insert the word "liter." In Paragraph S.1. delete the words "½ dry pint, 1 dry pint, or 1 dry quart" and insert "0.2 litre, 0.5 litre or 1 litre." And lastly, change the tolerance table to accommodate the previous S.I. units.

Thus, I have presented two different approaches, incorporating S.I. units in existing codes or two individual codes, one applicable to U.S. customary equipment and the other applicable to S.I. equipment. Which method do you prefer? Which satisfies best your needs? Which satisfies best the needs of the field official, the type approval official, the metrologist, the equipment manufacturer engineer, salesman or serviceman? All must be considered before a final decision is reached.

The following illustrates the decisions necessary to be made.

DECISION: GENERAL O. I. M. L. CONSIDERATIONS

Accept O. I. M. L. Philosophy

Question O. I. M. L. Philosophy—
Document technical or other constraints and negotiate technical differences internationally

Reject O. I. M. L. Philosophy

DECISION: SPECIFIC O. I. M. L. CONFLICTS

Tolerance
Scale Divisions vs percentage of load

Operating Characteristics
Rate of Flow: 10:1 vs 5:1

Minimum Capacity and Minimum Delivery
$40d_d$ 0.5 gal

Least Significant Decade Always Active
.01 t NOT 10 kg .01 kg NOT 10 g

Marking
IN & EX VS T.C. & T.D.

DECISION: TEST PROCEDURES

No Change

Revision

DECISION: STANDARDS

U.S. Customary—Metric Equivalent

U.S. Customary—Metric Supplement

S. I. Units—Denominations

DECISION: FORMAT

Two Manuals

Field Manual
Type Approval Manual
or
U.S. Customary Manual
S. I. Units Manual

What about dual indicating equipment or equipment designed for simple retro-fit?

Sections or Chapters
Color
White Green Pink
Print Style
Bold Face Italics
Page Size
6″ × 8″ (15.24 cm × 20.32 cm)
8″ × 10½″ (20.32 cm × 26.67 cm)

A Recommended Format for H44S.I.:

Section I

Introduction—Fundamental Considerations

General Code—General Tables

Section II

Mass Measurement
Scales—Belt-Conveyor Scales—Weights

Section III

Liquid and Vapor Measurement
Liquid-Measuring Devices—Water Meters—Vehicle Tank Meters—L. P. G. Liquid-Measuring Devices—L. P. G. Vapor-measuring devices—cryogenic L. M. D.

Section IV

Volumetric Measures

Liquid Measures—Vehicle Tanks used as Measures—Farm—Milk Tanks—Measure Containers—Milk Bottles—Lubricating—Oil Bottles—Graduates

Section V

Linear Measurement

Linear Measures—Fabric-Measuring Devices—Wire and Cordage-Measuring Devices—Taximeters—Odometers—Timing Devices

Finally, the following illustrates the critical path to be followed in resolving the issue "Specifications, Tolerances and Other Technical Requirements for Commercial Weighing and Measuring Devices" indicating in S.I. units.

A CRITICAL PATH IN THE DEVELOPMENT OF SPECIFICATIONS, TOLERANCES, AND OTHER TECHNICAL REQUIREMENTS FOR COMMERCIAL WEIGHING AND MEASURING DEVICES INDICATING IN S.I. UNITS

Identify interested parties
Identify changes necessary
Identify existing standards
O. I. M. L.—E. E. C.—A. S. T. M.
Identify conflicts
Resolve non controversial conflicts informally
Develop field standard specifications
Develop test procedures
Draft code
Circulate for comment

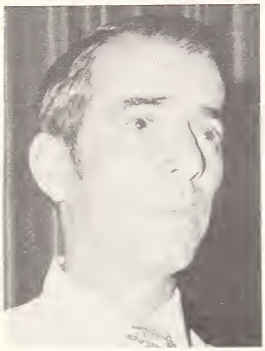
Submit to S & T Committee—Interim Meeting
S & T Recommendation to N. C. W. M. for action
N. C. W. M. Adoption!

U.S. Standard of Mass—Kg 20

In conclusion, Figure 1 is a photograph of Kg 20 as it rests in the possession of the National Bureau of Standards. It is the United States Standard of Mass and has been so for almost 100 years. Although this basis for mass measurement is a metric unit, it has not proven to be a constraint in the extensive use of the U. S. Customary System in the United States.

TASK FORCE REPORT ON NATIONAL TYPE APPROVAL

Presented by Ezio Delfino, Chief, Division of Measurement Standards, Department of Food and Agriculture, State of California



The idea for the task force for a National Type Approval program originated, oddly enough, in Sacramento, California, in what many of us consider the capitol of one of the strongest and most independent states in the Country.

The reasoning behind this idea is really very simple. We feel that the days that a State or local jurisdiction can be a "kingdom unto its own" are rapidly disappearing. The world is not only rapidly shrinking, it has shrunk significantly in the last few years.

We must be fair to our constituents. Our constituents are not only the consumering public but industry as well. Remember, all of us are taxpayers, weights and measures officials, industry and the consumer.

We feel that all of us must work together towards a common goal. Isn't it a waste of resources when five or six States are all working on basically the same studies for grain moisture meters? I think it is. Wouldn't all of us gain if somehow this vast resource could be coordinated? It seems to me that if our efforts could be coordinated the dollar savings to the taxpayer would be substantial.

By the same token, is it right for a manufacturer of weighing and measuring devices to have to go to a dozen different States, all with somewhat different rules for type approval? We feel that this is not only a waste of valuable resources, but an additional eventual cost to guess whom? You and me and all the other taxpayers. After all, any additional cost mandated to any part of the business community eventually is paid for by the ordinary taxpayer, you and me.

California strongly supports the concept of a sharing of knowledge and resources on a nationwide basis for type approval.

We sent a questionnaire to the task force members a couple of months ago asking for their viewpoints. The answers were many and varied; however, the over riding message came through, yes most were interested in exploring the concept.

We held our first meeting yesterday afternoon; as might be expected, there were little or no solid accomplishments, especially with an audience of 40 plus looking on as we struggled with our mission. However, I understand that this is the first time that such a group had ever sat down together to discuss such a project.

Perhaps that in itself is an accomplishment. In talking to various people before, during and after the meeting, we can perhaps think about some of the problems facing a project such as ours.

Some of them are:

1) No state or jurisdiction is willing to give up its veto power, at least not until whatever system is developed is proven.

2) There is a need to develop clear definitions of procedures.

3) National Bureau of Standards must raise its profile, achieve adequate funding and staffing and play a central role in this system. That role can be either one of coordination, actual testing, or both. We cannot implement a nationwide system without some kind of active participation by NBS.

4) Communications between industry, State and local jurisdictions and NBS must be improved. Some of this can be accomplished by better staffing by NBS.

5) State and local jurisdictions *must* have meaningful input in developing and maintaining such a system. Without that assurance, I can assure you it won't work.

These are just a few of the problems involved. The problems may make the feasibility of a peace treaty between the Arabs and the Jews a relatively simple task!

We in California feel strongly that we should pursue the concept that we are exploring. It need not be another Federal preemption, we would fight that concept.

Some of the things that might be considered are these:

1) Could NBS certify States to do nationwide type approval? They certify labs, why not type approval programs?

2) With NBS acting as a clearing house, could one State do proto type examinations and another with different capabilities do the field testing?

3) Is it feasible to have an advisory committee made up of Federal, State, local and industry personnel serve to set up whatever rules or procedures are necessary, with no one jurisdiction having a veto power?

Doubtless, there are many more avenues to explore.

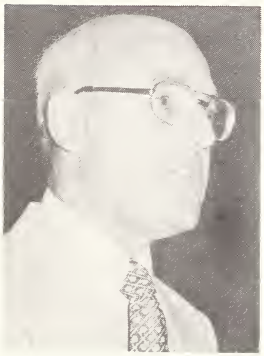
Frankly, we are tired of the Federal Government mandating programs on us or away from us. We want a voice in our own testing and I believe that if we put away our prejudices, whatever they may be, and really decide to work together in an open and frank manner, we will have a much better weights and measures community in this nation.

AFTERNOON SESSION—TUESDAY, JULY 19, 1977

(TRAFFORD F. BRINK, *Vice Chairperson*, Presiding)

THE SUPREME COURT DECISION: WHERE DO WE GO FROM HERE?

Presented by ALLEN J. FARRAR, Legal Adviser, National Bureau of Standards



This afternoon we will be discussing a decision rendered earlier this year by the Supreme Court of the United States which is of particular interest to State and local weights and measures officials. Its impact, however, will be felt also by food processers, manufacturers of food packaging materials, Federal inspectors and officials, and most of all by consumers—the largest of any of the affected groups and the one to which we all belong. It is our hope that you will ask questions of the panel in order that we can seek to understand the basis for the different points of view held by the various members of the panel and gain an insight to the purpose and meaning of the Court's decision and properly gauge its effect on the duties and responsibilities of those who must carry out their official duties in compliance with that decision.

The decision we are talking about is, of course, the one issued in the joint cases of Joseph W. Jones, Director of the Riverside County, California, Department of Weights and Measures vs. the Rath Packing Company, and Jones vs. General Mills, Inc., The Pillsbury Company, and Seaboard Allied Milling Corporation. Perhaps I should mention at this point that there was also a separate suit filed by Rath against M. H. Becker, Director of the Los Angeles County Department of Weights and Measures, involving essentially the same facts as those in Rath's suit against Jones. Rath's suits against Jones and Becker were later consolidated. Hence for the purpose of brevity and to simplify matters, I've reduced the various parties involved in these various suits to Jones on the one hand and Rath and the millers on the other.

Before we start our panel discussion, I believe a brief statement of the facts of the case and the Court's holding may be helpful. I said a moment ago that the Court's decision was handed down earlier this year. The story began, however, in 1971 when weights and measures officials from the office of Director Jones inspected packages of bacon and flour in supermarkets and found, after carry-

ing out a sampling process of weighing a certain number of packages in the lot being checked, that there was less bacon and flour on the average in the packages sampled than was indicated on the label of those packages. Jones then ordered the bacon and flour of Rath and the millers off sale. His action was based firstly, on a section of a California statute which states in part that "the average weight or measure of the packages or containers in a lot of any . . . commodity sampled shall not be less, at the time of sale or offer for sale, than the net weight or measure stated upon the package." Secondly, he acted pursuant to a regulation under the California Administrative Code. The regulation was issued in implementation of the statute and requires a statistical sampling process for determining the average net weight of a lot, which implicitly allows for variations from stated weight caused by unavoidable deviations in the manufacturing process but makes no allowance for loss of weight resulting from moisture loss during the course of good distribution practice.

Rath and the millers sued in the United States District Court in California to prevent Jones from enforcing the California statute and its implementing regulation. In essence, Rath and the millers contended that the California statute and regulation relied on by Jones were preempted by Federal laws regulating net weight labeling. The District Court granted the relief requested by Rath and the millers, and when Jones appealed that decision, the Court of Appeals for the 9th Circuit affirmed the decision. Jones appealed further to the Supreme Court and was joined in his appeal by 39 other States as amici curiae as well as by five other States and a number of national, regional and State organizations and law enforcement officers who expressed support of the position set out in the legal brief filed by those 39 States.

On March 29, 1977, the Supreme Court in a unanimous opinion affirmed the Court of Appeals decision with respect to the Rath bacon case and affirmed by a 7 to 2 vote the Court of Appeals decision with respect to the millers' case involving the packages of flour. A petition by Jones to the Supreme Court for a rehearing of its decision was denied on May 16, 1977.

The Federal laws cited by Rath and the millers in support of their position that such laws preempted the California law and regulation were the Wholesome Meat Act, the Fair Packaging and Labeling Act, and the Federal Food, Drug and Cosmetic Act.

With respect to the bacon, the Wholesome Meat Act, which allows "reasonable variations" in terms of the stated weight on a package, when considered with implementing regulations issued by the Department of Agriculture, requires the label of a meat product accurately to indicate the net weight of the contents unless the

difference between stated and actual weights is reasonable and results from the specified causes set out in those regulations. Those regulations state that "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."

Another section of the Wholesome Meat Act prohibits the imposition of "marking, labeling, packaging, or ingredient requirements in addition to, or different than, those made under the Act." The Court then concluded that this explicit preemption provision dictates the result in this case. California's use of a statistical sampling process to determine the average net weight of a lot of implicitly allows for variations from stated weight caused by unavoidable deviations in the manufacturing process. But, the Court added, California makes no allowance for loss of weight resulting from moisture loss during the course of good distribution practice. Thus, the State law's requirement—that the label accurately state the net weight, with implicit allowance only for reasonable manufacturing variations—is "different than" the Federal requirement, which permits manufacturing deviations *and* variations caused by moisture loss during good distribution practice. Hence, with respect to Rath's packaged bacon, the California statute and regulation were preempted by Federal law.

The flour case was more complicated. The Federal laws involved here are the Federal Food, Drug and Cosmetic Act and the Fair Packaging and Labeling Act. The Food, Drug and Cosmetic Act, like the Wholesome Meat Act, allows for "reasonable variations" in the stated weight on the package. Further, regulations issued by the Food and Drug Administration in implementation of the FDCA provide that "reasonable variations caused by loss or gain of moisture during the course of good distribution practice or by unavoidable deviations in good manufacturing practice will be recognized."

Since flour is a food under the Food, Drug and Cosmetic Act, its manufacture is also subject to the provisions of the Fair Packaging and Labeling Act. The FPLA states a Congressional policy that "packages and their labels should enable consumers to obtain accurate information as to the quantity of the contents and should facilitate value comparisons." The FPLA contains a savings clause which specifies that nothing in the FPLA "should be construed to repeal, invalidate, or supersede" the Food, Drug and Cosmetic Act. The Court pointed out that the legislative history of the FPLA contains some indication that the savings clause was understood to preserve the reasonable variation regulation under the Food, Drug and Cosmetic Act. The Court then stated it could only conclude

that under the FPLA, as under the Food, Drug and Cosmetic Act, a manufacturer of food is not subject to enforcement action for violation of the net weight labeling requirements if the label accurately states the net weight, with allowance for the specified reasonable variations.

The Food, Drug and Cosmetic Act contains no preemptive language. The FPLA on the other hand, declares that:

> "it is the express intent of Congress to supersede any and all laws of the States . . . insofar as they may . . . provide for the labeling of the net quantity of contents of the package of any consumer commodity . . . which are less stringent than or require information different from the requirements of section 4 of this Act or regulations promulgated pursuant thereto."

After considering the preemption aspect, the Court stated that the legislative history of the FPLA suggests that the statute expressly preempts only State laws governing net quantity labeling which impose requirements inconsistent with those imposed by Federal law. Since it would be possible to comply with the State law without triggering Federal enforcement action, the Court concluded that the State requirement is not inconsistent with Federal law. Hence, the Court held that the FPLA does not preempt the California statute and regulation.

However, that did not end the matter, for the Court went on to say that it still must determine whether the State law "stands as an obstacle to the accomplishment and execution of the full purposes and objectives of Congress." In arriving at that determination, the Court again referred to the fact that a major purpose of the FPLA is to facilitate value comparisons among similar products. The Court reasoned that this goal cannot be accomplished unless packages that bear the same indicated weight in fact contain the same quantity of the product for which the consumer is paying. It pointed out that flour is composed of flour solids and moisture and that the moisture content of flour does not remain constant after milling is completed but gains or loses moisture depending on the relative humidity of the atmosphere.

The Court then concluded that packages that meet the Federal labeling requirements, which permit variations from stated weight caused by the gain or loss of moisture, and that have the same stated quantity of contents can be expected to contain the same amount of flour solids. Manufacturers will produce flour with a moisture content fixed by requirements of the milling process. Since manufacturers have reason not to pack significantly more than is required and Federal law prohibits underpacking, they will pack the same amount of this similarly composed flour into packages of any given size. Therefore, despite any changes in weight resulting

from changes in moisture content during distribution, the packages will contain the same amount of flour solids when they reach the consumer. This identity of contents, says the Court, facilitates consumer comparisons.

The Court went on to say that the State's refusal to permit reasonable weight variations resulting from loss of moisture during distribution produces a different effect. In order to be certain of meeting the California standard, a miller must ensure that loss of moisture during distribution will not bring the weight of the contents below the stated weight. Local millers could do so by adjusting their packing practices to the specific humidity conditions of their region. Under those circumstances they would not have to overpack. By contrast, a miller with a national marketing area would not know the destination of its flour when it was packaged and would have to assume the flour would lose weight during distribution. The national manufacturer would therefore have to overpack.

Similarly, the Court added, manufacturers who distributed only in States that followed the Federal standard would not be concerned with compensating for possible moisture loss during distribution. However, national manufacturers who did not exclude the nonconforming States from their marketing area would have to overpack. Thus, as a result of the application of the California standard, consumers throughout the country who attempted to compare the value of identically labeled packages of flour would not be comparing packages which contained identical amounts of flour solids. Value comparisons which did not account for this difference would, in the Court's view, be misleading. Hence, with respect to the millers' flour, the Court concluded that the enforcement of the California statute, as implemented by its regulation, would prevent the "accomplishment and execution of the full purposes and objectives of Congress" in passing the FPLA. Under the Constitution, that result, the Court held, is impermissible, and the State law must yield to the Federal.

That was the *Jones* vs. *Rath* and the millers' case. For the weights and measures inspector, this decision means that the average net contents of a lot of packages no longer must at least equal the labeled net contents. If the packaged product is subject to moisture loss, allowance must be made for posssible weight loss. This means that the average net contents of a lot of packages, if checked at other than the packaging location, may be less than the net contents printed on the label and still be in compliance with the law.

The effect of that decision and its implications are now what we would like to discuss. Before we attempt to answer your questions,

I'd like to introduce the members of this distinguished panel. The members of the panel are:

*Dr. William Dubbert
U.S. Department of Agriculture

Dr. Dubbert is with the Food Safety and Quality Service of USDA, having regulatory authority for meat and poultry inspection.

*Mr. Allan Goodman
State of California

Mr. Goodman is Deputy Attorney General for California and argued part of California's position before the Supreme Court last December.

*Dr. Edward Heffron
State of Michigan

Dr. Heffron is Chief of the Food Inspection Division of the Michigan Department of Agriculture. As such, he manages the package compliance testing program carried out by Michigan weights and measures inspectors.

*Mr. Morris Kinne
General Host Corporation
Mr. Kinne had been with the Corporate Counsel for Rath Packing Company when he argued before the U.S. Court of Appeals for the Ninth Circuit.

*Mr. Daniel McCurry
National Consumers Congress

Mr. McCurry is the Midwest Regional Director of the National Consumers Congress.

*Mr. Neal Peterson
Peterson, Engberg and Peterson

Mr. Peterson's firm serves as counsel for General Mills.

*Mr. William Sedgwick
U.S. Food and Drug Administration

Mr. Sedgwick is with the Compliance Branch of the Dallas District Office of FDA.

Editor's Note: The following panel members submitted brief written statements for publication in the Conference Report as follows:

STATEMENT BY DR. DUBBERT

On November 26, 1973, the U.S. Department of Agriculture (USDA) initiated a proposal to revise and clarify those regulations that determine net weight compliance of meat and poultry products. The U.S. District Court for the Central District of California had held that our net weight labeling requirements were void for vagueness. The proposal provided, among other things, for a sampling and acceptance criteria for meat and poultry products that could be used at the plant level and at other locations.

Probably the most significant response to the proposal came from consumers who felt the averaging concept for determining net weight compliance was something new and clearly not acceptable. At this point, USDA chose not to pursue the issue further until the court decision was finalized.

In our view, the decision of the Supreme Court does not appear to require substantive changes in the operation of the Federal Meat and Poultry Inspection Program.

State and Federal goals should insure the same protection for all consumers through a practical, workable net weight compliance program. The court suggests that the program now in effect is just such system and cites the procedure described in the Department's "Meat and Poultry Inspection Manual" as a ". . . practical technique for policing net weight requirements . . ."

One issue does, however, require clarification. The concurrent jurisdiction provision of the Federal Meat Inspection Act allows States or any agency the right to follow Federal regulations which allow "reasonable variations caused by loss or gain of moisture during the course of good distribution practices or by unavoidable deviation in good manufacturing practices."

The State procedure, however, cannot be "different than" the Federal procedure. This makes an impossible situation for States who wish to monitor net weight compliance since the Department has not identified procedures defining "reasonable variations" for use outside the producing plant. In order to eliminate this problem, the Department is presently revising and clarifying its regulations. Various proposals and solutions are under consideration, and a rulemaking procedure will be instituted as quickly as possible.

STATEMENT BY DR. HEFFRON

Is a consumer confused if total prices on the labels of packages, all of which are a uniform given quantity of the same product, vary as much as 10% and as many as 10-15% of the packages have this variance? Wouldn't the purchaser choose the lowest priced item in every trip to the market? Wouldn't she question the capabilities, even the motives of the packer? Certainly she would be wise to purchase the lowest priced packages.

Yet, the packer of that commodity can label those packages with a uniform given net weight and uniform given total but because of differences in packing quantities, shipping time and the environment the above consumer can in reality be getting, without her knowledge, the described variances in true value. She does not know which is the best value—only her packer knows. Yet, at his option all the packages can be less than the quantity stated on the label and perhaps significantly less than the actual product quantity in the previous week's shipment or the current shipment of a competitor. Wouldn't the packer choose to deliver the lowest quantity for the price in every trip to the market even though it is less than that required of his competitor and less than that stated on the label? Certainly most people would say he is wise to sell the lowest legal quantity for the same given price. Some marketing experts have paraphrased the situation in this manner: Would the seller accept a variable but always less than the labelled total price for the products he is offering for sale because the consumers trip cost to the market or some similar consideration was variable. I don't believe so! But, the consumer is being told to pay a set price for an unknown variable quantity often significantly less than that on the label. The confidence of the consumer, the discouragement of marketplace monopolies and the regard for centuries old quantity representations have been challenged and have lost. Lost, but I believe only for an interim period until these qualities can be restored and perhaps more firmly reinstated.

Food product quality has long been recognized to be inexact, genenerally a subjective measurement procedure while food product

quantity was an exact measurement which could be objectively described. We no longer see the point of sale, but rather the point of packing, as the point of determination of quantity as an exact measurement. How long before we see the point of packing rather than the point of sale be the determination point for food quality. No longer would bananas and peaches need to be harvested and packed green.

The first concern of an enforcement agency is to be assured their procedures are legal and meaningful. Although past procedures may have been meaningful they are presently not legal. Many present quantity assurance procedures are totally inadequate-unmeaningful but in a manner of interpretation-legal. I refer, in part, to the lack of federal officials to routinely check weights at the time of shipment. The checks made at the time of packing are far from adequate but as critical is the fact the product is not checked by regulatory officials at the time of shipment unless coincidental to the time of packing. This allows many packages to enter commerce with substantially less than the labelled quantity. We are referring to the average weight of a lot weighing less than the labelled quantity during its entire life in commerce.

Various proposals concerning correction of the problems have been discussed;

(1) Require tare weights to be stated on each package so the retailer (or purchaser) could use a convenient "store provided" accurate scale to determine a dry tare net weight either as a basis for voluntary correction by the retailer or for information to the consumer. This, of course, would not allow wet tare to be used.

(2) Require retail stores to serve notice that federally inspected products would likely contain less than the quantity stated on the label. Presently a similar requirement by Michigan concerning ingredients in sausage products is being challenged in the U. S. District Court of Western Michigan. This requirement could only serve as an alert to the consumer and would not in itself correct the problems.

(3) Provide an accurate official weighing method consistent with all packers. This is necessary as a basis for any packing operation and would need to be much more sophisticated if product can later be checked to be assured only moisture is missing and that the product did weigh at least the stated amount at the time of packing.

(4) Require a public disclosure notice in each retail market showing the actual weights of samples of products during the previous weights and measures inspection. This would obviously need rigorous uniform sampling.

(5) A uniform monitoring program by state weights and measures officials with meaningful information of apparent shortages

over "expected" shrinkage relayed to the proper official overseeing that packing plant. This would need much more sophistication than presently available and could only be conducted as part of a more comprehensive program.

In the meantime, weights and measures officials must conduct a reasonable information and education program to alert the consumer to the marketplace differences in net weight between products of federally inspected packers versus those packed for a point of sale true net weight.

STATEMENT BY MR. KINNE

The Supreme Court of the United States on March 29, 1977, in the matter of *Jones, Director, Department of Weights and Measures, Riverside County* v. *Rath Packing Co. et al.* decided the controversy between the State of California Department of Weights and Measures and the Rath Packing Company as to whether California could apply its net weight laws to packages of bacon packaged under federal inspection. The Court concluded that California's net weight laws and regulations were pre-empted by the Federal Wholesome Meat Act and that California could not do anything "in addition to, or different than" the federal law with respect to net weight requirements for meat products packaged under federal inspections. A companion case involving *Jones* and *General Mills, Inc.* that concerned net weight requirements for packaged flour was also decided, but I am limiting my comments to the *Rath* decision.

This controversy started in late 1971 when both Jones and Maynard Becker, Director of Weights and Measures, Los Angeles County, began ordering substantial quantities of Rath bacon off sale as being short weight under Cal. Bus. & Prof. Code Section 12211 and 4 Cal. Administrative Code c.8, Subch. 2, Art. 5. Article 5 was a statistical sampling procedure adopted by California to determine the average net weight of contents of the lot of packages being checked. A "wet" tare, i.e., a tare which includes any moisture absorbed into the packaging material, was used in arriving at the net weight of the contents of the individual packages checked. No allowance was made by California for either moisture lost to the atmosphere or moisture absorbed into the packaging material. If the average weight of the sample packages tested for net weight on a wet tare basis equaled or exceeded the label weight, the lot was passed. Lots failing to pass Article 5 were ordered off-sale and returned to the manufacturer. In February and March the District Attorneys for Riverside County and Los Angeles County respectively filed complaints against Rath in California Superior Court charging Rath with false advertising and unfair competition under

California law because of packages of bacon alleged to have been short weight under Article 5. Fines of $2,500 for each short weight package of bacon were asked. Rath claimed to be in compliance with federal law as to the net weight of contents of the bacon and shortly thereafter filed complaints against Jones and Becker in Federal District Court in California seeking a declaratory judgment that the Federal Wholesome Meat Act pre-empted Section 12211 and Article 5 of the California law and that California could not do anything "in addition to or different than" what the federal law required as to net weight requirements. Rath also sought an injunction against Jones and Becker to prohibit them from enforcing Section 12211 and Article 5 against Rath's bacon. The Attorney General of California later intervened on behalf of the California Director of Agriculture in the cases involving Los Angeles County Department of Weights and Measures and its Director, Maynard Becker.

The Federal Wholesome Meat Act, 21 U.S.C. Section 601(n), provides that meat is "misbranded":

> "(5) if in a package or other container unless it bears a label showing . . . (B) an accurate statement of the quantity of the contents in terms of weights, measures, or numerical count: Provided, That . . . reasonable variations may be permitted, and exemptions as to small packages may be established, by regulations prescribed by the Secretary."

The Secretary of Agriculture has used his authority to permit "reasonable variations" in the accuracy of the required statement of quantity:

> "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 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." 9 CFR 317.2(h)(2) 1976).

The method used by the U.S.D.A. in determining net weight pursuant to the federal statute and regulation is set out in Subpart 18-K of the Federal Manual of Meat Inspection Procedure. Proceedings ran concurrently in both the state and federal courts on the controversy in 1972, '73, '74 and '75. Proceedings in the state courts have been inactive since the federal 9th Circuit Court of Appeals ruled that the Federal Wholesome Meat Act pre-empted California Section 12211 and Article 5 and that the federal regulation, 9 CFR Section 317.2(h)(2), was valid. The case was argued before the Supreme Court of the United States on December 6-7,

1976 and the Supreme Court in *Jones* v. *Rath Packing Co.* held that as to federally inspected meat products:

(1) The Federal Wholesome Meat Act, 21 U.S.C. Section 601 et seq. and 9 CFR Section 317.2(h)(2) pre-empts state net weight labeling standards which are in addition to, or different than, those net weight labeling standards made under said federal statute and regulation.

(2) The Federal Wholesome Meat Act, 21 U.S.C. Section 601 et seq., and 9 CFR Section 317.2(h)(a) require recognition of reasonable variations caused by loss or gain of moisture during the course of good distribution practices or by unavoidable deviations in good manufacturing practices.

(3) The net weight labeling standards under the Federal Wholesome Meat Act and 9 CFR Section 317.2(h)(2) require recognition of at least the following variations from labeled net weight (Reference Court opinion footnotes 10 and 16):

(a) For sliced bacon, an individual package variation for unavoidable deviations in good manufacturing practices of not less than plus or minus 5/16 ounce per pound; plus

(b) For sliced bacon, an individual package variation and a lot variation for loss of moisture to the package (tare) during the course of good distribution practices, of not less than minus 5/16 ounce per pound for a wax impregnated board insert, and not less than a minus 1/16 ounce per pound for a polyethylene board insert; plus

(c) For sliced bacon not vacuum packed, an individual package variation and a lot variation for loss of moisture to the atmosphere during the course of good distribution practices of minus 0.3 to 0.4 sixteenth of an ounce per pound per day after leaving the federal establishment.

(4) State standards not in addition to or different than the federal net weight labeling standard may be enforced by appropriate state procedure at the wholesale and retail levels.

State and local governments still have the authority to regulate weights and measures of meat and other food products packed under federal inspection within their jurisdiction as long as such regulation is in conformity with federal standards. The task for the Conference and the National Bureau of Standards is to provide a recommended system for the state and local governments to use to conform their standards with the federal standards.

OUTLINE OF REMARKS BY MR. PETERSON

I. The decision confirms our view of the status of the law on weight compliance for family flour.

A. There is a need for a uniform national standard.

B. There is a need to recognize and allow for moisture loss during distribution.

1. The question of a constitutional right to a recognition of moisture loss was passed over by the Court, but it was not ruled out either. We continue to believe that such a right exists on the basis of *Overt* v. *State*.

II. The decision relied upon a recognition of a strong Federal interest in facilitating value comparisons between product brands.

A. The Congressional findings in the Fair Packaging and Labeling Act set this forth.

B. No other regulatory system allows for meaningful comparisons between products.

1. A minimum weight requirement would not offer an equal quantity for determining a unit price which could be compared across brands.

2. A fixed allowance (whether based upon the proportion of flour solids or on some other criteria) mandating a particular overpack, likewise is unable to provide a quantity which allows the determination of a unit price for comparison purposes.

III. The question of who should pay for water which is contained in virtually all food commodities is very complex, in a physical as well as a regulatory sense.

A. The first proposition that must be accepted is that consideration of these complexities must be divorced completely from suggestions and innuendos about fraud in the marketplace. Reputable food processors abhor deliberate short weighting. Such practices are counterproductive, not merely in public relations terms, but for the economic stability of the American food industry.

B. The second proposition that must be accepted is that all food contains varying amounts of water. Today's plump, juicy chicken is just that because of the water it contains. Unless the public is willing to change its dietary habits so that only fully dried products are available, some acceptance by the Weights and Measures officials must be obtained for the proposition that food will lose water.

C. All food commodities do not lose water at the same rate. Certain of them (flour especially) can lose or gain moisture. A single system for determining reasonable moisture loss is not possible.

D. The goal of net weight regulation must be to prevent cheating, not to penalize a particular party to a commodity transaction

on account of a physical phenomenon over which no one has effective control.

1. Hermetically sealed product or plastic packaged product is not really a solution because this merely preserves the water and thereby weight.

E. Overpacking and waterproof packaging both result in substantial additional costs in processing food commodities which must be paid for by the consumer.

IV. If Weights and Measures officials are unable to accept a procedure which allows a reasonable moisture loss as determined by each inspector, then the only rational solution to their dilemma is in-plant inspection.

A. A complete state operated in-plant inspection program requires reciprocity from other states.

B. Western Regional Conference has approved such a program.

C. Such steps must be expanded and particularly to those commodities such as flour which gain and lose moisture.

1. These hygroscopic commodities are the very items for which such a reciprocal program has importance.

D. Many manufacturers would welcome inspections of their production facilities.

PANEL DISCUSSION

The following is an edited condensation of the many questions that were answered by the panel during this session.

Mr. Adams: I would like to ask Dr. Dubbert what the U.S. Department of Agriculture plans to do to implement the Supreme Court decision?

Dr. Dubbert: Well, we very recently received some pretty strict directions to proceed with rule making with particular emphasis towards the issue that is concerning this conference. So there is going to be some more rule making which will be a new proposal, as compared to going with the provisions of our previous proposal in 1973, without you having further opportunity for comment. I also would like to recommend that we continue the interagency net weight committee meetings. It's very complicated to deal with the net weight issue since the responsibilities are so wide spread throughout government. I think we need to continue such a dialogue. Things have changed since 1973. Not only do we have the Supreme Court decision now but industry practices have changed. Maybe some of your thinking has changed also. I'm sure you'll let us know about that when we publish our new proposal.

Mr. Stadolnik: Is the Food and Drug Administration contemplating any change in their regulations relative to quantities to be allowed for moisture variation?

Mr. Sedgwick: You present a very difficult question to try to answer. As far as I'm aware this decision has not as yet had any significant effect or caused any change in the way FDA has viewed the net weight question or the policies that may be involved with respect to net weight.

We have not really viewed the Supreme Court Decision as "a victory for Federal law as opposed to State law." Nor do I think it was intended to be that. Really all it does is point out the need for perhaps closer cooperation between the Federal and State, County, or city authorities.

The Food and Drug Administration does stand ready, whenever requested by one of you, to assist in making inspections or checks of net weight in those locations that you may not have the ability or authority to go into. On the other hand, we would also ask you to do the same thing. If we make an inspection of a facility and determine during the inspection that there is a problem with net weight, it is quite likely that we would come to the State or to the local authority and request you to assist us in making a follow-up inspection.

Variations caused by shrinkage or moisture, whatever term you wish to apply to it, creates a significant problem not only for you but for us. We would expect that the net quantity of contents, the statement that appears on the package, to be accurate. Our investigators do have the same problem that you do when it comes to looking at that in the field. In the absence of having an analyst and a laboratory in your hip pocket, you need some readily available and quick answers as to whether or not the product involved is in compliance or in violation of your law. Our investigators approach it in the same manner as you might from the standpoint of weighing a number of units, selected at random from a lot, and then averaging that in comparison with an average tare. If short weight is found, the thing that we do, that perhaps you do not do, is to look at how much short weight it is; particularly, with respect to those types of commodities that are hygroscopic or those you might expect to gain or lose moisture. What we will do is to apply a principle of approximately one percent. It's no secret; it's a guideline that we use. If we find that short weight commodities are more than one percent short, then we will review the situation in more detail and perhaps check it for moisture loss as well as some of the other variables that are involved. Basically, that's where we stand on the net weight question.

Mr. Couden: The California code permits considerable variation

due to good manufacturing practice and yet requires that the average of the lot meet the declared fill. The Court said now you must take moisture into consideration. My question is where in that Court decision does it say specifically that variation due to moisture loss should be treated differently than variation due to good manufacturing practice? I am not satisfied at the interpretation of the Court decision that moisture loss variation is to be treated differently from the variation that is due to good manufacturing practice.

Mr. Goodman: I think that Mr. Couden's question is very well taken. In footnote 19 of the Court's decision, the Court says, "moisture loss during distribution will obviously cause the net weight of bacon to be less than it was when the bacon left the packaging plant. An averaging procedure in which deviations above the average cancel deviations below the average does not make any allowance for moisture loss during good distribution practices which works in only one direction."

Now California Article V, just as NBS Handbook 67, operated on an average weight basis and thus moisture variations which were more than label weight were cancelled out against moisture variations which were less than label weight. And the Court rejected that in this footnote. Our argument to the Court was based on the theory of Article V that the average weight concept had become enshrined in the national weights and measures program enforced by all of the States.

What the Court says in Footnote 19 and by its rejection of Article V is that no longer will moisture variations below label weight be compensated for variations above label weight.

I think personally that this brings out a revolution in weights and measures enforcement. As a gentleman said earlier this afternoon, what standard do I use? How do I know what the packager did at the packing plant? How do I know whether his standards are good manufacturing standards? How can I determine whether the distribution practice is good and whether the variation is reasonable?

My personal opinion is that those are very difficult tasks to assign to the thousands of field inspectors in the United States. It assumes that every inspector in this room and all of your colleagues across the country have some kind of special foresight or, better yet, hindsight.

So the response to Mr. Couden is that the California theory has been rejected by the Supreme Court. I sense in something that Dr. Dubbert said that USDA now is of the opinion that they have sole right to determine the procedure which the State and local jurisdictions are going to use to enforce the Federal net weight standard, which is now true weight, apparently at time of shipment.

Now that may, and I underscore the word may, be the situation

under the Courts opinion. That does not necessarily have to be the case. The second step in this whole procedure is that the Secretary of Health, Education and Welfare, with respect to products regulated by the Food, Drug, and Cosmetic Act, and the Secretary of Agriculture, with respect to products regulated by the Wholesome Meat Act and the Poultry Products Inspection Act, both have the authority to change the regulations to reinstate the true weight on the average concept. That is another question which this Conference may want to address at a later time.

Mr. Draghetti: I'd like to ask Mr. McCurry if the National Consumers Congress is going to delve into this, and will consumers be apprised of the really serious situation that weights and measures inspectors are finding themselves in due to the ramifications of this decision of the Supreme Court?

Mr. McCurry: Yes, we are looking at this situation and have been since 1973 and even before that. I would like to impress upon everybody the seriousness of which the national consumer groups view this situation.

We have complaints from individual shoppers concerning a whole series of intentional and unintentional thefts of consumers money due to short weight. We see the Supreme Court decision as in no way discouraging the continuation of short weight practices and in many ways discouraging the ability of weights and measures officials to function as protection for consumers.

As for the three organizations of which I am a Director, we have foreign members, we have urban members, we have small businessmen members and while I don't pretend to speak for all of them, all of them have spoken to me about the situation and how they view it. So, yes, we are delving into it and our former Executive Director, Carol Tucker Forman, has been apprised of the situation time and time again. She carries that knowledge with her in her new role with the U.S. Department of Agriculture.

I've spoken around the country over the past year to numerous weights and measures officials about the situation as it was developing and to some of you since the Supreme Court handed down its decision in March. I welcome the opportunity to continue to do so. We've neglected, as consumer groups, discussion with weights and measures officials on State and local levels, and this decision is waking up many of our local affiliates to the real strength and the real needs for support that weights and measures officials around the country have needed. I welcome the possibility that the Department of Agriculture will go rule making again, as they put it. I hope they do go through the full Administrative Procedures Act and make these regulations the force of law.

But I also think that we've got to look very closely and carefully

at the kind of powers inherent in State officials and State organizations to take some of the steam out of this Court decision. And finally I personally have discussed with a number of Congressional representatives the option of introducing Federal legislation to deal with this situation. If in the next six months other kinds of matters don't pick up the pace, then there are many Congressmen that are ready to draft and introduce legislation that will.

MR. FARRAR: I'd like to exercise my authority as moderator at this point to simply make an observation; and that is, there were 39 States joined in the brief that was filed with the Supreme Court when the Court came down with this decision. Obviously that was a defeat for those number of States who joined as well as a large number of organizations and law enforcement officers that had supported the legal position of the States.

Let's find out now from Mr. Kinne and Mr. Peterson whether industry is entirely satisfied with the decision?

MR. KINNE: One point I would like to make is that it is obvious that there is a disagreement as to what authority State and local weights and measures people would like to have for the enforcement of their laws and what they see as the best way to protect the consumer.

As the Court itself said, Rath was not found to be cheating the consumer and I hate to see that type of language used. It was complying with the regulations of the United States Department of Agriculture. No doubt many will continue to argue whether those are the proper regulations for enforcement in this area. But we are concerned with only one item, loss of moisture. I recognize that it is extremely difficult to measure for moisture after the packages have left the place of packing. But again I want to reiterate I do not feel it is a question of whether the consumer was being cheated.

The question we are talking about is the methodology that is to be used so that you can satisfy yourself that the proper weight is in the package recognizing the fact that there are deviations.

MR. PETERSON: I would like to respond to your question as to whether we are satisfied with the Supreme Court decision. I really don't think it is a question of whether we are satisfied or dissatisfied. We believe that the Supreme Court states the law the way it exists in this country. We believe that they traced the history from the first Conference reports that went back to 1913 with regard to the Congressional feeling about a national policy and about the importance of giving an allowance for moisture losses. As the Court indicated and as we have suggested for a long time the consumers major interest is that when the flour is packaged at the plant that it be packed according to law and that it be packed honestly. The consumer is interested in the solid product in the package in terms

of the nutrition and what it will do. We believe the consumer really would not be served if in fact a standard were set up, and we believe this is what the Supreme Court rejected, by which in order to have uniformity in the distribution and sale of flour, millers would find it difficult to make a value comparison under this set up.

Now this does create a difficult situation. There is no easy method to know, when one checkweighs a bag of flour after he has taken it from the shelf, how much moisture it may have lost without some investigating process.

One method some of my clients have talked about over the years, which I think at least bears some thought, is in line with what the Western Regional Conference suggested a year ago with regard to hermetically sealed products. And that is the States could work together, set up standards, and have State inspection at mills where the flour is packed. Other States would then accept the results of the State which checked the flour. Of course, that would mean it would not be necessary to check packages to the same extent at the retail level, since a State would be willing to accept another State's inplant inspection.

This thought should be considered because it would assure people that they are getting the solids in that bag of flour as well as the nutrition that they are paying for.

Mr. Goodman: I would like comment on the previous proposals. First in reference to what the Supreme Court said, there is nothing in the Court's decision which precludes USDA or any other Federal agency from changing the Federal standard to require true weight at retail.

The Ninth Circuit Court of Appeals specifically held that there was no burden on interstate commerce. And interestingly enough, General Mills, Seaboard, and Allied Milling, the three companies in which that issue was raised on their behalf, chose not to appeal that issue to the Supreme Court. A question then is would there be any preemption, any federal supremacy clause problem, if the USDA or the other Federal agencies required true weight at retail? The answer to that is no. The question really is what standard should the consumers in this nation have. Should it be true weight at time of packaging, or at time of shipment subject to variations or shortages?

Another question is, is it impossible or difficult for the packer to meet a true weight at retail standard? I know from the evidence collected by the Los Angeles County Department of Weights and Measures that most packers are meeting the true weight at retail requirement. There was only one packer who had substantial short weights for any lengthy period of time. We know the packers can meet that standard. We also know the packers make retail weight

inspections. They follow their packages through all the way from packing at the factory to time of retail sale. And they have very good figures on how much the normal shrink it, and that by use of those figures and infrequent repetition of their field tests, they could determine what the shortage would be and pack accordingly. So I disagree with both Mr. Kinne as to what the Supreme Court requires, and with Mr. Peterson as to whether it is possible for the packers to meet the standard.

Mr. Offner: I would like to express, first of all, that I think all weights and measures people recognize that the Court has spoken and that we will have to live with its decision. But that does not relieve us of some of the concerns that we have based on our own experience.

We are concerned with not only what are the standards; but how, in fact, have the standards been applied. Let me cite just a few short experiences. I have had a Food and Drug Administration man within my own area tell me: "Good grief, there are plants in this State that we can't ever send a man into. We haven't got the manpower. Nobody ever gets into them."

I have also had a personal experience in a poultry packing plant, a small plant federally inspected and an inspector on the premises at all times. What did we find when we walked in there. The packer was using two scales, both of which had stickers on them indicating that they had previously been condemned in an adjoining State. They were being used day in and day out by this plant, with a Federal inspector there, and not so much as a word being said to us.

Now I've had this experience with a large retailer in St. Louis. He watches for short weight packages very closely. When they receive a shipment of pork sausage from the packer, they will spot check it themselves. If they find shortages, they will relabel the packages as random pack and put them out for sale without telling us about the problem. Sometimes these shipments are high and low and all over the place, but rather than get into trouble either with me or his customer, he will just treat them as random weight meat items.

Gentlemen, it is not a question of what the standards are. The thing that bothers me and bothers an awful lot of people is how, in fact, are these standards being applied.

I think I should make one other comment. I am not trying to indict the Federal agencies because I find no fault in their work and the areas in which their greatest expertise exists. I think it is a matter of priority, it is how they see it. The fact of the matter is that most of the Federal agencies do not see weights and measures as a high priority item.

Mr. McCurry: I really think I ought to reflect the position of

that average consumer. In this case I mean the food shopper, we can also include the small businessman and the farmer for their positions on this case.

There is a deep anger and a deep concern when that one package picked up out of the cooler or off the shelf is in fact short weighted beyond the price of the label that is on the package.

I got a letter from a constituent who said she saw a sign on one of the stores, "Products sold here may be short weighted. Buy at your own risk!" It's that concern, the integrity of the law both locally and nationally, that is somehow not coming down on the side of the consumer. The label may or may not say what is in the package and the price may vary up and down. So I really have to reject the idea that packers have no control over their products. If packers were not exerting the system that Mr. Goodman was talking about our whole system would break down. You would have much greater variations right now than what you presently have.

My experience indicates that consumers across the nation would say, yes, even if in fact a net weight standard would require them to pay a little bit more to have the protection of that law which we can trust, when we make our purchases.

Mr. Sedgwick: I would like to make a comment in response to Mr. Offner. It is true that the Food and Drug Administration does not, like the Department of Agriculture, have inspectors stationed in plants. We do make periodic inspections and routine surveillance or what we term as compliance investigations or inspections. This is one of the areas where we may be of some help to each other. When you determine that there is a problem, you should let us know. If we can do something about it by inspection or subsequent sample collections, we will go into the plant.

Frequently corrections occur if your presence is known. I suspect, as State and local officials, that you are well aware of the effect you have and the great amount of correction you can achieve merely by going into the packing plant or business establishment. I suspect that you are going to be as effective tomorrow as you are today. The Supreme Court decision will not materially cause a change in how you affect the industry that you regulate.

Mr. Johnson: I would like to direct two questions to the panel. First, I can not quite agree with the statement that this decision will not affect weights and measures. As a State administrator, if I assign inspectors to the first point of entry and check interstate commerce commodities and we found them short, there is nothing we can really do about them because there is no way that we can enforce or know for sure that these packages were correct when packed. If I am correct in this assumption, then where do we

weights and measures officials go from here? Where do we stand?

Mr. Heffron: I will first address the question about where do we go from here. In Michigan we feel we have an obligation to the consumer which requires us to notify him of what he is buying. So immediately after the decision, we issued a news release that explained the decision and I will read part of it to you:

"Therefore the declared net weight on a package that is Federally inspected may differ from the actual weight of the package at the time purchased by the consumer. In other words, the consumer may pay for more than he receives. This ruling will apply primarily to meats, poultry and some frozen foods in the State. Most Federally inspected products carry an official USDA inspection legend, so consumers will be able to identify those items in the grocery store."

We may require retail establishments to place a sign stating that those products bearing a USDA legend may very likely weigh less than the labeled amount.

As you may be aware we have a special statute in Michigan now on standards of sausage products. We may also require that tare weight be stated on each package for the retailer. This would allow the retailer or the purchaser to use a convenient and accurate store scale to determine the correct net weight either as a basis for voluntary correction for the retailer or information for the consumer.

I would also hope that we can provide an accurate official weighing method consistent with all packers. I believe this is what USDA is going to propose. Some products that we have checked recently were very short when we met the truck from the plant and we are speaking of two, three, and four percent short. When we contacted USDA officials to find out what the records were at the plant, we were told that was the week that there were no checks on net weight.

When we find a short weight product from another State we notify the appropriate agency in that State who is responsible for that product. We give them all the information that we can, the code number and other things. But we leave the enforcement up to them. We are glad to cooperate with other States in a reciprocal way on such matters.

Mr. Lyles: Am I to assume that we are dealing here with only meat products and flour? What about other items that may lose moisture but which were not covered by the Supreme Court?

I am speaking about such commodities as cake mixes, cereal, and other things that may lose moisture. Are we prohibited from checking those under the Supreme Court decision?

Mr. Farrar: Well, I think the only way that can be answered is that it probably depends to a degree on whom you ask and what standard or regulation the product may come under. Apparently the Supreme Court preferred not to answer that question. It really answered only the questions that were placed in front of it. Maybe some of the other panel members would like to respond to this question.

Mr. Peterson: In my opinion, the Court case would apply to products that are similarly situated and one can not say which products it would apply to specifically. Products would have to be looked at one at a time to see if they would be analogous to the flour situation. I think lawyers would say, as they interpret all opinions, you have one strict interpretation as to the exact set of facts that comes before the Court, but then if the facts were reasonably applied to another situation, the opinion would apply to it also.

Mr. Goodman: I agree with Mr. Peterson that it is a question now of deciding what product is similar to flour. But as you probably are well aware, lawyers play a little game when it comes to arguing what is reasonable. What is reasonable to a lawyer of General Mills may not be reasonable to a lawyer who represents a consumer. Thus, I fear that the lawyers for the industry are going to say, and they could probably be excused for saying this, although I happen to have a different opinion, that most products or any product which is hygroscopic is covered by the Supreme Court. You may see another lawsuit over what is a similar product to flour, or what is or is not covered.

Mr. Houghton: I feel that our weights and measures procedures which allow for reasonable variations is still a good plan and I would not want to see anything come up that would establish tolerances for packaged products. I am sure you will agree that many packers would shoot for the limit of any tolerance that might be established.

Mr. McCurry: I would like to request that a great deal more consumer imput be encouraged in these Conference proceedings. In closing, may I thank you all for allowing me to be here. Consumer groups really consider this issue of net weight to be one of the top priorities in the whole question of food labeling. I think we need each other to try to sort out the directions to go on.

NBS HANDBOOK 67: WHERE THE PATHS HAVE LED

Presented by Dr. Carroll S. Brickenkamp, Office of Weights and Measures, National Bureau of Standards

For the past three years, and even before then, a small group from the Office of Weights and Measures and the Statistical Engineering Laboratory of the National Bureau of Standards has been devising a set of procedures which regulatory officials can use to test packaged goods for compliance with existing Federal and State laws and regulations, principally net weight labeling regulations. The results of our work to date will be contained in a document which will be distributed for review and comment before the end of the calendar year. This document will be entitled the draft of the revision of NBS Handbook 67 "Checking Prepackaged Commodities."

Because of the anticipated impact of the document on the entire packaging arena, affecting consumers, packagers, and government regulatory officials, I will preview for you today what this draft will contain.

The draft, just as was the original 1959 edition of NBS Handbook 67, will be in the form of a procedural guide for legal control of prepackaged goods by regulatory officials. The draft document is being written primarily with weights and measures officials in mind, but we at NBS are expecting that our ongoing discussions with Federal agencies having package labeling responsibilities will produce a final handbook which can be used generally by any inspector, whether Federal, State, or local.

It must be understood by everyone that Handbook 67 cannot change existing regulations. Handbook 67 provides procedures, insofar as is possible, to test compliance with existing regulations.

The draft will look formidable, being nearly 90 pages long. However, in day-to-day use by an inspector, except for a few tables to which the inspector will have to refer, a single sheet of instructions will cover all the possible measurements which the inspector could have to make. This is not, I am sure you will agree, very formidable.

The first half of the document will contain preliminary considerations such as the general principles of compliance testing, (including what equipment will be necessary for testing) and the general techniques of sampling. It is the "text book" portion of

Handbook 67. The size of this portion, about 40 pages, demonstrates the importance of the educational program that will be necessary to enable inspectors, using sampling techniques, to effectively test packaged products for compliance with the law.

Handbook 67 is based upon two fundamental requirements common to almost all the packaging and labeling regulations. The first is that the average net quantity (weight, volume, count, etc.) of all the packages in a lot, shipment, or delivery must equal or exceed the labeled net quantity printed on the packages. The second is that no unreasonable shortages are permitted in individual packages comprising the lot, shipment, or delivery.

The draft of Handbook 67 will contain two categories of sampling plans termed "Category A" and "Category B." This scheme has been proposed because of the vastly different types of official action that might be taken as a result of failure of packages to pass inspection. Sampling plans presented in Category A may be used when the severity of the consequences for the packager or retailer of a lot not passing inspection is relatively great. This might be the case, for example, when levy of a fine or court action based on a single test were such consequences. Sampling plans in Category B, however, may be used when the consequences of a lot not passing the single inspection is relatively minor for the packager or retailer. Such consequences might include, for example, off-sale actions or repackaging and remarking. The differences between Category A and B are the following. Category A sampling plans use larger sample sizes than Category B for the same size of lot. Category A plans also require the calculation of the standard deviation for the sample in order to obtain information about the average quantity in the lot.

There are a number of ways these sampling plans can be used and combined depending on the individual management requirements for any given jurisdiction. For example, Category B plans can be used exclusively to obtain a history of compliance or noncompliance for individual products. Another possibility is the use of a Category A plan to obtain court evidence on a single lot when the inspection of that lot using a Category B plan shows gross shortages.

No matter which sampling plan is used, package compliance testing as presented in the draft will consist of four distinct steps. First, the lot, shipment, or delivery upon which a decision will be made as to compliance or noncompliance is defined so that the number of individual packages comprising that lot, shipment, or delivery, may be counted. Secondly, a random sample is chosen from the lot. Thirdly, measurements are made on each package comprising the sample. Finally, a decision is made as to compliance

or noncompliance of the lot, shipment, or delivery, based on the measurements on the sample.

I will now preview some of the specific measurements that are made on sample packages.

Tare determination is one of the most important of these measurements. Because the cost effectiveness and efficiency of inspection is greatly enhanced when non-destructive testing is employed as far as possible, that is, when packages comprising the sample do not all have to be opened for testing, procedures will be included which, in general, require opening only a very few (a minimum of one) packages in order to determine an average tare weight which can then be subtracted from the actual gross weight of individual packages in the sample in order to determine the sample net weights. Methods will also be provided which will enable an inspector to determine when it is necessary to open more than the minimum number of packages when the variability in tare weights appears to contribute sizeably to the variability allowed in net weights. The types of packages for which this situation most frequently will arise are either glass-packed goods or aerosol products.

All the existing Federal and State regulations allow "reasonable variations," for two causes: (quoting from the FDA and USDA regulations)

(1) ". . . loss or gain of moisture during the course of good distribution practices . . .," and

(2) ". . . unavoidable deviations in good manufacturing practice . . ." [FDA regulations: 21CFR 101.105(q), USDA regulations: 9CFR 317.2(h)(2).]

The draft handbook will define the limits of reasonable variations occurring in good manufacturing practices. These limits of reasonable variations will be called "Maximum Allowable Variations" (MAV) and will be presented, wherever possible, as a percentage of the labeled quantity. The MAV's have been derived from existing data on packaged goods variability and also contain judgments about what constitutes "good manufacturing practice" and the maximum amount of individual package shortage which a consumer should have to bear. For example, for packages labeled by liquid volume, the draft handbook will propose MAV's as shown in tabulation on the following page.

The draft handbook, however, cannot give such clear and precise limits for reasonable variations arising from the loss or gain of moisture during good distribution practices. As much information as is currently available will be presented in a form which can provide some very loose guidelines to a package inspector. The amount of weight loss to be expected in "average" environmental

conditions will be presented in graphical form as a function of the amount of time since the product was packaged. The decisions as to whether shortages found in packages at retail or wholesale locations are, in fact, caused by moisture loss and whether any given amount of shortage is indeed "reasonable" will still be left to the judgment of the inspector.

MAV (expressed as a percentage of labeled quantity)	Liquid Volume (including Frozen Liquids)
1%	greater than 1 gal (if labeled in customary units) or 4 L (if labeled in metric)
2%	greater than 1 qt to and including 1 gal or 1 L to and including 4 L
3%	greater than 1 pt to and including 1 qt or 500 mL to and including 1 L
5%	greater than 3 fl oz to and including 16 fl oz or 100 mL to and including 500 mL
7%	greater than ¼ fl oz to and including 3 fl oz or 10 mL to and including 100 mL
10%	less than ¼ fl oz or 10 mL

The U.S. Department of Agriculture and the Food and Drug Administration are examining that portion of their regulations which allows for package variations due to moisture loss. It is possible that the enforcement and measurement problems associated with this requirement may change in the near future if these Federal agencies revise their regulations.

In order for Handbook 67 to define quantitatively what variations would be reasonable for loss or gain of moisture, it would be necessary to obtain experimental data on the amount of moisture lost or gained by specific products in specific package materials under all the possible environmental conditions to which the package may be exposed from the time of packaging up to the maximum shelf life of the commodity. To illustrate the enormity of this task, I would like to draw your attention to the "Quantity of Contents Compendium" revised by V. H. Blomquist and M. Prochazka of the Food and Drug Administration in 1966 with subsequent additions in the 1970's. This collection of data includes "shrinkage experiments" dating from 1914 to 1972 on less than fifteen different commodity types. It represents an enormous amount of work but contains information on very few products,

with much of the data totally out of date because of the changes in packaging and distribution methods and materials over the last sixty years. Only the most recent data contain information on such environmental influences such as the temperature and humidity of storage. Even for those few products listed, this document can be used only as a very rough estimate as to the amount of moisture any individual commodity may lost or gain. Given enough time, manpower, and other resources, more data on more products in modern packaging materials could be collected. However, it would be extremely difficult to collect and analyze such data and make it available before packaging methods and materials have changed significantly.

It has been suggested that if the inspector were to measure both net weight and the moisture content of packaged goods at the time of inspection, he could, if he also knew the moisture content of the packaged goods at the time of packaging, use the difference in moisture content measurements between the time of packaging and the time of inspection to calculate what the net weight of the packages would have been at the time of packaging to determine if they were full net weight at that time. It has been further suggested that one might infer the moisture content of packaged goods at the time of packaging from the Federal standards for food identity. There are problems with this suggestion, however, as a panacea for moisture loss allowances. There are only three categories of food which have moisture content specifications as part of their Federal standard of identity: cereal flours, macaroni products, and cheeses. The specified moisture contents are maximum values. For cheeses, (21 CFR § 133.102 and following) these maximum values differ from the actual moisture contents at the time of packaging by as much as 10 or 20 percent. Thus, the Federal standards do not provide suitable information for inferring the moisture content of cheeses at the time of packaging. The situation for flour and macaroni is somewhat better (flour: 21CFR § 137.105 and following, macaroni: 21 CFR § 139.110 and following); however, the specified moisture contents (15 percent for almost all types of flour and 13 percent for macaroni products) are, again, maximum values and not the actual moisture contents at the time of packaging. The actual moisture content will be somewhat lower than the maximum values. A difference of as little as ½ percent between the maximum allowable moisture content and the actual moisture content of flour, for example, corresponds to an error of measurement of 0.4 ounce in a five pound bag of flour. This is eight times the expected error in weighing five pound packages.

To summarize, if a particular package or group of packages which are susceptible to moisture loss are found (at some location

other than where packaged) to weigh less than the amount declared on the label, it is presently not possible to devise methods which would ascertain for certain whether the detected short weight is due to short weight at the time of packaging or due to subsequent moisture loss.

Detailed techniques of package testing for specific types of packages will comprise almost the entire last half of the draft handbook. It is the "cook book" portion of the draft, just as the first half is the "text book." The general method for testing packages labeled by weight, for example, will consist of three pages of detailed instructions and a one page diagram summarizing all the possible procedures which may have to be followed.

The techniques section of the draft handbook will be divided according to the types of units in which the packages are labeled: weight, liquid or dry volume, linear, square, or cubic measure, and so forth. This section will further be subdivided into general methods and methods for special commodity types. For example, in the chapter on packages labeled by weight there are descriptions of tests for standard pack (the general method), random pack (individually weighed and marked packages), aerosol packaged products, frozen products, and packages labeled by drained weight.

In order to facilitate testing of as many packages as possible nondestructively, the draft handbook will provide gravimetric procedures for testing packages labeled in units different than weight as well as test methods to determine when weighing packages labeled in other units is suitable for use. For example, if a package is labeled in units of liquid volume, it would be more efficient and less costly if the inspector could, instead of opening and measuring the volume of liquid products contained in every package in the sample, measure the weight of the volume of product labeled on the package and together with the average weight of the tare use this total weight to compare against the actual weights of unopened packages in the sample in order to determine the net volume of these packages. However, the weight of a given volume of packaged product cannot vary from package to package for this method to work. Therefore, the inspector will also be given guidance as to when this procedure of using weight comparisons is suitable to determine compliance for packages labeled in other units of measure.

Again, I would like to emphasize that the actual methods of test are not as formidable as the size of the draft might suggest. For example, in most cases the inspector's methodology when inspecting the vast majority of packaged goods at retail will not be different from the methods he has been taught using the 1959 edition of NBS Handbook 67. The draft handbook, however, will answer questions which will arise in less commonly tested products

and other questions which were not answered in the original handbook. For example, how many packages must an inspector open if a glass jar containing instant coffee with a labeled net contents of 3 ounces weighs 7 ounces empty? Also, how short in measure can an individual roll of foil labeled "100 ft" be and still be acceptable for sale? The revision of Handbook 67 seeks to answer these and other such questions.

This completes the preview of the draft which will be distributed to weights and measures agencies, consumer organizations, trade associations, and private individuals about the end of this calendar year.

We at NBS are looking forward very much to receiving your suggestions and comments on this draft so that we may move with all due speed towards the publication of the revision of NBS Handbook 67.

THE CREATION AND CHALLENGE OF A STATE METRIC BOARD

Presented by JOHN J. BARTFAI, Director, Bureau of Weights and Measures, Department of Agriculture and Markets, State of New York

I would like to thank the National Conference for giving me the opportunity to speak here today and share with you some thoughts on "The Creation and Challenge of a State Metric Board." My intent this afternoon is to not only bring you up to date on the progress of metric activity in New York State, but hopefully provide some insight into how we approached and tackled this thing known as "metrication."

The need for a planned and orderly metrication program was given recognition by Governor Hugh L. Carey when in August of last year he established the State Metric Council. The Council was created to assure that the resources of state government are used to assist governmental agencies as well as the business, labor and agricultural communities and consumers in the transition to the metric system of measurement. J. Roger Barber, Commissioner of the New York State Department of Agriculture and Markets, was selected to chair the State Council. The Bureau of Weights and Measures of the Department of Agriculture and Markets has been entrusted with executive and secretarial responsibilities. Thus I am able to give a firsthand report on our program.

To date, the State Council has met seven times and has formed three separate sub-committees to further explore the metric impact on the state's various sectors, find ways of easing the transition for all concerned and provide assistance as required.

In a few minutes I shall discuss more in detail the Council's membership, responsibilities and activities as well as the challenges that we have faced and those that lie before us as the rate of metrication increases. But first I think it is appropriate to present to you some background and an outline of the events which led to the creation of the State Council.

In June 1975 an ad hoc Metric Planning Committee was formed following the initiative of the Bureau of Weights and Measures and the Department of Agriculture and Markets. The impetus behind this important event was due to the completion of a study earlier in 1975 concerning the effectiveness of the State Weights

and Measures Program. From this study, a Model Program was developed which was primarily aimed at improving the relationship between the Bureau and 93 local weights and measures jurisdictions. A portion of the Model Program called for the preparation of a comprehensive metric conversion plan for the statewide program and other units of government in the State.

The Bureau discovered, through its subsequent study of the metric issue, that some metric activity had been taking place on the State governmental level, but no communications between those agencies involved was apparent.

As early as October 1974 the State Department of Commerce had conducted a series of metrication mini-conferences to acquaint manufacturers and businessmen of the State with the development, advantages and progress of metric. In January 1975 the New York State Education Department formed their own internal metric committee. The Commissioner of Education then endorsed the committee's proposal of a "carefully planned and coordinated changeover to metrics in instructional programs of schools in the State."

Thus, through our preliminary investigation did we see the need to get all those knowledgeable about metric together. The ad hoc Metric Planning Committee established was composed of representatives from Education, Transportation, industry, as well as from the Bureau. In July 1975 the Planning Committee developed a survey questionnaire which was distributed to all state agencies in order to establish a preliminary overview of the effect that metrication would have on their respective programs, fiscal requirements, personnel, equipment and materials, and, in addition, polled their interest in attending a Metric Planning Conference. The results of the survey indicated that the impact on State organizations caused by any degree of metrication was great and that some forty State agencies were interested in attending a Planning Conference.

On November 25, 1975, the State Metric Planning Conference was convened, attended by approximately 200 individuals representing government, business, industry, labor, agriculture and education. Conference goals were to further study and assess the impact of metrication upon State government, its economic sectors and citizens.

The ad hoc committee then assimilated the information gathered from the Conference and survey questionnaires and issued a conference report in January 1976. The report included a series of recommendations and a planned course of State action to ensure an orderly transition to the metric system of measurement. The major recommendation was that of the creation of a State Metric

Board. The report was widely circulated.

On February 18, 1976, Governor Hugh L. Carey in his Special Economic Message to the Legislature said in part " . . . The changeover (to the metric system) in our State will create vast opportunities for retooling and upgrading machine and equipment investments and will open up new opportunities for international trade . . . I will establish a State Metric Conversion Council to make recommendations on the specific ways in which the integrating powers of government may be used to ease this transition . . ."

Finally, on August 27, 1976 the Governor created the New York State Metric Council. The Governor designated Commissioner Barber of Agriculture and Markets Chairman and appointed nine other Commissioners to sit on the Council. They are the Commissioners of Commerce, Consumer Protection, General Services, Labor, Environmental Conservation, Transportation, Education, and the Secretary of State, the Chairman of the Thruway Authority, and the Chancellor of the State University.

The responsibilities given to the Council by the Governor included the establishment of a metric conversion program in harmony with directions set by the United States Metric Board and the federal government; supervision and coordination of all conversion activities within State and local governments; review of all State laws, rules and regulations governing the standards of weights and measures, and preparation of any revisions necessitated by adoption of the metric system; and gathering, maintaining and disseminating metric information and providing technical assistance as necessary to foster metric conversion in the State.

The first official meeting of the State Council was held last October 27. All State agencies designated sent representatives. Since that time two additional agencies have been invited to sit on the Council—the Department of Civil Service and Motor Vehicles.

The early gatherings of the Council were more or less aimed at orienting representatives towards metric, what it is and what it means. In addition, the Bureau, on behalf of the Department of Agriculture and Markets, presented a comprehensive revision of our Weights and Measures Law to the Council for their review and approval. The law revision is intended to accommodate the metric system of measurement into our State's commerce (update status of law).

Subsequent meetings of the Council proved to be the really challenging ones as we hashed out many questions that needed to be answered and set forth our priorities.

The primary question which had to be answered was "What is

the proper role of the State Council in relation to a federal program?"

Well, it was decided that a State program of voluntary conversion should take place in a coordinated fashion and in step-by-step pace with the rest of the nation. Therefore, we would want to work closely with and interface with the U. S. Metric Board, when established, and with other appropriate Federal agencies and private sector organizations, such as the American National Metric Council.

As to our priorities. First it seemed desirable, if not critical, to develop awareness programs for our respective agency constituencies and the general public. These awareness and educational programs would have to address and respond to the public's likely apprehensiveness of metric and answer the question of "why" go metric.

Secondly, it was felt that the Council should begin identifying those kinds of restrictions that we may have in the State that would prohibit industry and other sectors from converting—such as laws, regulations and policies.

As previously touched upon, Council representatives concurred that cooperating and communicating with other pertinent groups was paramount in any orderly transition. The Council has initiated establishing lines of communication with the Federal government and others. Several months ago we sent a telegram to President Carter urging the prompt establishment of the U. S. Metric Board and indicating the Council's desire to work with the U. S. Board.

A representative of the New York State Department of Commerce represented the State at a metric meeting of the Scientific and Technology Committee of the National Governors Conference in May in Atlanta.

The State Council joined the American National Metric Council this past January and we expect to utilize their expertise when the State's industry encounters any problems. The Council's subcommittee on Consumer and Industry Liaison will interface with the American National Metric Council.

Of course, the State Bureau of Weights and Measures has been in regular contact with Jeff Odom of OWM and he has always come to our assistance by providing valuable information and materials.

I mentioned a minute ago the priority the State Council gave to awareness and education programs. These really started to get off the ground last November when the New York State Education Department proclaimed the 17th of that month "Metric Awareness Day." Schools throughout the State stressed metric education and

activities and hundreds participated.

Weights and Measures Week" gave the Council an opportunity to develop ideas as to how best achieve public awareness of metric as well as make aware State agency personnel. We solicited the assistance of TV weather broadcasters across the State in this effort. The response from this sector was most encouraging. In addition, the Associated Press ran a story on our efforts which was carried by 10 major daily papers throughout the State. Participating Council agencies posted hundreds of the NBS fact sheet "All You Need to Know About Metric" in strategic points in their respective Albany and regional offices.

Governor Carey proclaimed May 9-13 as "Metric Week" to coincide with the National Council of Teachers of Mathematics observance of this week. We have distributed approximately 1,000 "Metric Style Guides for the News Media"—an NBS publication —to papers, periodicals, radio stations and TV stations in the State. Further, the Bureau, through our Department's Public Relations Office, has been running 30 second metric educational radio spots and has been offering metric literature to the public. We have been receiving 75-100 requests a day for metric information. We are now planning to develop some TV spots as well. Finally, the State's Cooperative Extension Service has carried on educational programs for adults across the State.

I believe that the media must play a most important role in the transition to metric. Gaining their support and working with them in your respective States is a challenge that you must successfully carry out and should be made a number one priority of any metric awareness program. As for the New York State Council, this challenge has been undertaken by our Public Information and Education Sub-Committee.

Clearing the legal and other barriers for metric transition has now drawn much of the Council's time and attention. It is imperative to receive input from all those who will be affected most as to not burden any one sector. I previously talked about the revision of the State Weights and Measures Law—which had been reviewed by all Council representatives and affected private sector groups. We have established legislative liaison with the State's law makers. The Council will shortly request that the appropriate people in the State House perform a computer assisted review and identification of all measurement sensitive laws so that these can be changed to allow metric at the proper timing sequences.

A State and Local Government Liaison Sub-Committee of the Council has also been established. This group will coordinate activities on the State level and provide assistance and work with localities. This group has been discussing implementation policy

proposals and recommendations for submission to the Governor. Among those areas being explored is the use of metric units in government documents and publications and a government procurement policy.

One experimental conversion effort currently taking place in the State is the replacement of customarily marked exit signs to metric kilometers on the New York State Thruway between Syracuse and Rochester. 44 signs are involved and the resigning is expected to be completed by September 1. The exit signs which formerly bore a one mile to exit now will read 2 km and be moved to this distance. The signs are being replaced on a normal replacement cycle and no extra cost has been incurred. Since road signs in the United States probably will be converted within the next couple of years, it was decided to carry out this pilot program. It is being carried out not only in an economical manner but will provide driver awareness as well.

In conclusion, I believe that the activities of the New York State Metric Council are unique in that they demonstrate that all units of government and the private sector can work together towards a common goal. Further, the Council and its member agencies are performing a vital educational service to all people of the State. The lines of communication opened up with all pertinent groups will prove fruitful as the level of metrication increases so as to ensure an orderly smooth transition.

Finally, Weights and Measures should take a leadership in your States if no formal action has taken place and steps should be taken to bring down the barriers to metrication.

WEIGHTS AND MEASURES PROGRAM EVALUATION: THE STATE'S VIEWPOINT

Presented by Marion L. Kinlaw, Director, Consumer Standards Division, Department of Agriculture, State of North Carolina

I want to thank all of you on the committee for giving me the opportunity to meet with you here today and I also want to congratulate you for trying to develop a procedure to be used for measuring the effectiveness of a Weights and Measures program. Although this Conference is considering many subjects important to the Weights and Measures community, if you are successful in this endeavor, the significance of your work will over shadow all of the other work you are now doing, and all of the work of all of the other committees are now doing and your efforts will bring about a major advancement in Weights and Measures.

I personally have been in Weights and Measures a long time. There are, of course, a lot of things about Weights and Measures I do not know; but all during the time I have been in Weights and Measures, I have consistently said and almost all other officials have consistently said, to all who would hear, that a sound Weights and Measures program is essential to accommodate the commerce of the Nation. We have also said that the more complex commerce becomes, the more important becomes the associated Weights and Measures program.

It is well known that the United States has the most highly developed and complex system of commerce ever developed on this earth. We are hard pressed to explain why we proclaim Weights and Measures to be such an essential service to our Nation, yet at the same time have no satisfactory method developed to determine the productivity of a Weights and Measures program. Our failure in the past to develop such a method is a performance that is less than admirable and is a situation that must be corrected. We must develop a method of evaluation that produces results with the same degree of certainty usually associated with the term "measure."

At the present time, most Weights and Measures jurisdictions estimate their productivity or effectiveness, as you know, by counting in some way the units of work done. (The number of devices approved or rejected, or condemned, and so forth.) This method

does not provide a true indication of the effectiveness of a program. The basic problem with this method is simply that any figures obtained require the reader to take into account many variables and, therefore, the figures are immediately suspect and subject to endless rebuttal.

The best known way to determine the effectiveness of a Weights and Measures program would be to develop an accreditation system, similar to that in use to evaluate many other essential or complex operations such as large law enforcement departments, fire departments, health departments, military units, hospitals, schools, universities, and so forth. Most accreditation systems operate in two distinct steps. STEP ONE: Is the developing of the criteria used for evaluation. (The development of the Yard stick) STEP TWO: is the application of the criteria, or yard stick to a particular unit being evaluated. The First Step is very vital and the Second Step is more routine or clerical in nature provided the First Step is thoroughly completed.

The First Step is usually done by recruiting a group of unbiased and knowledgeable people in the field and somehow officially charging them with the responsibility of determining what elements make up an excellent program. The criteria are usually compartmentalized so that particular weaknesses or strengths of the organization being evaluated can be identified. Each criterion is usually so arranged that when it is used as a measure, its results can be easily summarized. Usually a numerical value is assigned each element of the criteria so that when all elements are added, the total figure is one hundred. The criteria are then published as clearly as possible so that the Second Step can proceed in a clerical fashion. Evaluation is usually voluntary.

I am not here today indicating that an accreditation program will be easy to put into effect. I do not mean to imply that all the problems to be encountered in setting up an evaluation program can be immediately solved. Because problems will be found that are perhaps now very hard to solve, does not mean that we must not begin. We should not try to solve all of the problems we will find. We can simply go around some of the hard questions and for the time being ignore them. Experience obtained as we go along will cause some of the situations now seemingly insolvable to prove to be less formidable than now thought. One example of a problem we should just simply ignore and go around is the problem of trying to determine at this time what emphasis any particular jurisdiction should put in any particular field, due to the economic impact in that particular geographical area. Ignore this, avoid trying to solve this. From this time and place it cannot be solved. It may later yield to solution. Most of the criteria needed for evalu-

ation and perhaps all of the criteria needed are in administration manuals long published.

Let me urge you not to decide the criteria hurriedly. It is not something we must complete this week. It is something we must begin this week. Specifically, I think the Education Committee should appoint or see to it that a Criteria Committee is appointed. I would hope you would not tack this on just as an addition to your other responsibilities. At this conference, I ask you to take the first step in this direction and then that major advancement in Weights and Measures that I earlier mentioned will have begun.

MORNING SESSION—WEDNESDAY, JULY 20, 1977

(Earl Prideaux, *Chairperson*, Presiding)

WELCOME TO DALLAS

Presented by Honorable William F. Nicol, Councilman, City of Dallas, Texas

It is a great pleasure that I, on behalf of the City of Dallas, take this opportunity to welcome the 62nd National Conference on Weights and Measures to the great city of Dallas. I would like to greet the enforcement officials, representatives of business and industry, trade and consumer organizations and other government officials who have assembled for this National Conference today. Dallas is delighted that you have chosen to hold your 62nd Conference here. This is the first time you've so honored us and we sincerely hope that your stay will be so delightful that you will want to return again soon and often.

I'm continually surprised that so few citizens of our great country recognize the importance of the Weights and Measures officials and their work and the industry that they are associated with. Seldom do they stop to think that everyday scales and measuring equipment affect their lives in many ways. After most of us got our first spanking, we were put on a scale. The next step, after we were weighed, we were measured to see how long we were. From then everything that we viewed or came in contact with has been affected or controlled by scales and measuring equipment.

We live in an ever-changing world. In the short span of the lives of many of us, we have seen scales evolve from a simple level system with a beam to a sophisticated electronic system. What worries me is where does it stop? When I was serving as President of the Rotary Club of Dallas, we had a speaker who talked about the prospect that very soon we would be establishing factories in space. He explained that space factories would have many advantages. They would be super clean, there would be no dust, they would be germ-free and since there was no gravity a piece of equipment as big as a house could be moved by the touch of a finger. When he finished, I told him his speech didn't make me very enthusiastic about future developments, as I was in the scale business.

Nichols scales did sell and send a small instrument scale to the moon to be used to weigh water for the life support of the astro-

nauts before they stepped down on the moon. But, we haven't been able to get a service contract to go back and work on it.

Which of you will test the approved mass measuring devices that are now in the laboratories to be used in space? Somebody is going to have to inspect them. Is it going to be one of you? I understand that in San Antonio, right now, there's about a $500,000.00 project to develop equipment which will determine the mass in outer space. How it's going to be done, I don't know. But, they claim they are going to be able to do it.

This rapid development of the weighing industry must be met and is being met by dedicated devotion of weights and measures officials. Yesterday, we weighed in pounds and ounces; today by pounds and hundreds of pounds; and tomorrow, by kilograms and grams. Yesterday, we used beam scales and dials and levers; tomorrow, load cells, digital read outs and processors and computers. Your race to keep abreast of all of the many developments is a constant challenge to each of you. How well you have met the problems today is a tribute to the long hours of study and hard work of all weights and measures officials.

We, in Texas, have been blessed by many dedicated weights and measures officials. In the City of Dallas, we are particularly proud of the contribution of two of its native sons. I say native sons, one of them was actually born in Dallas and one was born in Mayo. Anybody who lives within a hundred miles of Dallas, we consider a native son of Dallas. J. D. Walton is a native of Mayo, Texas. He entered weights and measures in 1937 and became a weights and measures inspector for the Texas Department of Agriculture under Bill Bussey's leadership. In 1941, J.D. joined the City of Dallas as head of the Weights and Measures Department. He served as a Weights and Measures Director until 1972, at which time he was named Director of the Consumer Affairs Division and headed the Dallas new Municipal Protection Agency, which was created under his leadership as an example and an expansion of the existing Weights and Measures Department. After a distinguished 33 years career, he retired on December 31, 1973, and it was under his direction that the Department became known as the nation's foremost local Weights and Measures Agency. In addition to his expansion of the weights and measures function into a broad consumer protection department, he received national recognition for publicizing the fundamental importance of local weights and measures enforcement to the consumer. J.D. and his wife, Lily, still live in Dallas, and as one of his retirement hobbies he is now the Executive Director of the Metroplex Merchants Council.

The next man I want to tell you a little bit about is a man I can't talk much about without getting a little frog in my throat

because he has meant so much to me personally as well as to all weights and measures officials world wide.

W. S. (Bill) Bussey is a native of Dallas. He began his distinguished career 41 years ago in weights and measures as a serviceman in Dallas in 1926. Bill joined the staff of the State Weights and Measures Division in 1931 and was promoted to State Director of Weights and Measures in 1936. He served as a State Director until 1948, except for a three-year period for the Private Scale Industry from 1943-46. Bill was called to Washington in 1948 as Assistant Chief of the Office of Weights and Measures. He was promoted to the Chief of the Office in 1950 and headed the Office of Weights and Measures until 1961 when he was again promoted but this time to the Assistant to the Director of the National Bureau of Standards. He retired from the Bureau on March 31, 1964. Time will not permit me to recite the long list of honors and awards that Bill has received during his career. But, I do have a couple of things that I want to mention. Bill is the only non-British citizen to ever be elected to a membership in the British Institute of Weights and Measures and, in fact, he was elected the Vice President of that organization. It should also be known that the late Philip A. Hart credited Bill Bussey with providing the knowledge and inspiration which led to the Congressional enactment of the Truth in Packaging legislation. Bill and his wife, Lil, now live in Austin, Texas, and as you might expect he is still keeping busy in weights and measures.

Bill has helped me in more ways than I can ever tell you personally and if you get me started I can tell you many, many anecdotes. Bill helped me to get out of spots and as a young scale man starting out 30 years ago, I got in a lot of messes quick. Particularly with weights and measures officials. I don't know why.

We hope that while you are here, you will take time to visit the points of interest in Dallas. I hope that you and your wives have enjoyed and have had time to visit the many stores in Dallas. I hope that you will enjoy the old fashion barbecue and rodeo this evening.

His Honor, Robert S. Fulton, Mayor of the City of Dallas, has asked me to read a proclamation that was presented to him and passed by the City Council last Wednesday. It is as follows, "Proclamation: whereas, the National Conference on Weights and Measures brings together enforcement officials, government officials, representatives of business, industry, trade associations and consumer organizations, for the purpose of hearing and discussing subjects that relate to the field of weights and measures technology and administration and, whereas, the program of the National Conference on Weights and Measures and its Committees explore the broad

area of this economically important segment of the government regulatory service and, whereas, the Conference has been cited on numerous occasions for its outstanding success and its achieving of its major objective, offering understanding and cooperation among weights and measures officials and between them and all industry, business and consumer, now, therefore, I, Robert S. Fulton, Mayor of the City of Dallas, do hereby proclaim the week of July 17th to the 22nd, 1977, as Weights and Measures Awareness Week in Dallas, and urge Dallas Citizens to observe the contributions of the officials who promote uniformity of weights and measures requirements on a State and local jurisdiction." Signed Robert S. Fulton, Mayor of the City of Dallas.

ADDRESS

Presented by R. S. Walleigh,
Acting Deputy Director, National Bureau of Standards

Dr. Ambler, the Acting Director of the National Bureau of Standards, is unable to be here today. He sends the Conference his greetings and his best wishes for a successful, productive meeting. Dr. Ambler is representing the United States Government today in a meeting of an International Committee for Weights and Measures in Paris.

When Dr. Ambler asked me to represent him here today I jumped at the chance. Why? It gave me an opportunity to visit this great State of Texas, the great city of Dallas and most importantly it gave me an opportunity for closer ties with the National Conference on Weights and Measures. In my many years at the Bureau, I have become quite knowledgeable of the close and effective relationship between the Bureau and the National Conference. It is an example of Federal/State interaction at its very best.

A commercial I've seen for one of our airlines talks about "doing what we do best." That slogan describes both NBS and state and local officials. Each of us has a unique role, a unique responsibility, in the quest for equity. Combining our efforts truly produces a whole greater than the sum of the parts.

Back in 1901, when Congress established the "National Bureau of Standards, we were given the task of "cooperation with the States in securing uniform weights and measures laws and methods

of inspection." The key word in that legal passage is cooperation. Congress recognized the distinct difference between Federal and States responsibilities, and saw cooperation as a major ingredient in weights and measures progress.

And there certainly was a great need for progress. In a *Science* magazine article dated 1893, the Superintendent of the Coast Survey said "there are about as many systems of weights and measures in use today as there are states in the Union." A nation growing in both size and complexity could not tolerate such chaotic conditions.

From the very beginning NBS took its weights and measures responsibilities quite seriously. Within months of our founding Louis Fisher of NBS surveyed all the state laws regarding weights and measures. Then his group designed simple, accurate standards and balances that could be used by state officials in the quest for uniformity. In 1905 NBS held the 1st national meeting of state sealers, a meeting that evolved a few years later into the National Conference on Weights and Measures.

I went back and read some of the early reports of Conference meetings, and would like to quote some of my favorite passages:

> 1905 "Many of the delegates—learned for the first time the importance of the work of testing commercial weights and measures."
>
> 1907 "The conference outlined and recommended a model law for adoption by the States."
>
> 1908 "The Territory of New Mexico—submitted to the Bureau a set of state standards and six sets of secondary standards, thus setting a worthy example to States in the protection of honest merchants and the public."
>
> 1910 "Gratifying progress in the enactment of State legislation, the passing of new ordinances by cities, and the appointment of the proper officials under these laws and ordinances."

Let's face it, those passages indicated that our precedessors had a massive challenge, and they attacked it full steam ahead. And I can safely say that the early momentum has never faded.

We at NBS have paid close attention to our weights and measures functions over the years. The emphasis has of course changed, but the commitment has not.

Some of our current efforts bear mention at this time. One that I am personally quite familiar with is the new state standards program. I had the pleasure of presenting standards to the states of New Jersey and Alabama and on those occasions both Bud

Wollin and the state officials made sure I got full exposure to the weights and measures story. Congress authorized this program back in 1966, and all but 2 of the 53 jurisdictions have received their updated standards and measuring equipment. Within the next year we expect this program to be completed.

Of course, new standards are just one part of the quest for accuracy. The Laboratory Auditing Program conducted by the Office of Weights and Measures helps provide continuing accuracy and traceability through an effective monitoring system.

We at NBS see technical training as an important part of our weights and measures function. Recently, we have broadened our training coverage in a number of ways. For example, we initiated the use of regional schools, in which personnel from several states gather at one location. Such centralized schools provide more efficient training sessions, and they have the added benefit of providing a forum for the exchange of ideas between jurisdictions. Another new move is the inclusion, when appropriate, of manufacturers representatives, local service industry people and users of weights and measures equipment in our training program.

We have also conducted seminars aimed directly at administrators, training officers, and supervisors. Such sessions provide an effective means for getting the latest techniques passed along to field personnel who need them. And, of course, we are providing metric training that has been tailored specifically for weights and measures officials. In planning our training program we will continue to work with the Conference Committee on Education, Administration, and Consumer Affairs. Our joint aim is to provide a well balanced, timely, nationwide program that answers the needs arising from new technology, modern merchandising, and metric conversion.

In response to the Fair Packaging and Labeling Act, we work closely with the Conference Committee on Laws and Regulations. To date, 39 states have adopted model state regulations that have been developed in the packaging and labeling area, a significant step in the interest of uniformity.

Unfortunately, some parts of the model regulations we all worked so hard to get adopted act as barriers to potential metric usage. For example, the provision in some states that milk must be sold in specified quantities only, such as quart or gallon, makes it illegal to sell a liter of milk.

As you know, the intent of the Metric Conversion Act is to foster voluntary conversion to metric usage. While no one will be pushed into metric use, roadblocks to conversion should be eliminated whenever possible. That's why we are revising the model regulations to facilitate the swing to metric in the marketplace.

We see this revision as a most important function, since many people will have their first real exposure to the metric system on packages and their labels. If the groundwork is properly laid, and that's our collective job, then the coming conversion to metric use in commercial transactions can go quite smoothly. And if people feel comfortable with the metric system when they put their money down for a purchase, then I predict they will readily make the switch in other areas as well.

Few companies will go metric just for the sake of change. They must have some incentive for doing so. I believe that conversion of packages to metric sizes provides ample reason for going metric. For example, many commodities could be packaged in relatively few rational metric unit sizes. Doing so could save industry money and time in a number of ways, including the standardization of shipping containers. The consumer would also benefit through reduction of the confusing array of packaging sizes. We in the Conference will have a major role to play in many aspects of the coming swing to metric.

Speaking of packages and labels brings me to another important topic—that of checking the accuracy of quantity statements on prepackaged goods. As you know, we've been working to revise Handbook 67 on Checking Prepackaged Commodities. Our goal is to provide uniform, efficient procedures, including statistical sampling methods and non-destructive testing. Not only are you state officials deeply involved in the revision, but so are consumers, industry and other Federal agencies.

The Federal agencies include Agriculture, Food and Drug, and the Federal Trade Commission, all of whom have responsibilities for package quantity accuracy. We are working with these agencies, as well as with you, to achieve a universally accepted control system. After a great deal of effort at all levels a revised document is nearing completion, and will be coming to you soon for your comments. Final acceptance of the revision will be a major step forward in protection of both supplier and consumer.

I mentioned the Department of Agriculture a moment ago. Last November, in response to the Grain Standards Act, the Department organized a new Federal Grain Inspection Service. This group is responsible for setting national grade standards and for inspecting and weighing all grain sold for export. Since moisture in grain has long been a problem, the Service is quite interested in accurate moisture measurements, and will fund work at our Boulder Laboratories on grain moisture meters. The Boulder group is looking at new systems that measure the dielectric constant of grain by its microwave transmission properties. The microwave approach offers hope of a simple on-line technique for measuring moisture.

This work at Boulder is an addition to the on-going moisture project in the Office of Weights and Measures, a project involving cooperation with officials in 10 states. In this program, the moisture of grain samples is determined in the lab, and then the samples are taken into the field to test various moisture meters. We feel that between these two projects—one on meters and the other on samples—substantial progress will be made in a most important measurement area.

Let me mention just one more activity directly related to weights and measures, and that is prototype examination. Our Office of Weights and Measures examines new measuring devices to determine whether or not they comply with provisions of Handbook 44. This service fosters the development of new devices, eliminates possible duplication of efforts by the States, and makes use of the unique measurement capability at NBS. That's good news. So is the fact that a veritable flood of new devices is coming to us for examination, for this signifies vitality and innovation on the part of industry. The bad news is that we just cannot keep up with demand. We have a backlog of about 30 devices awaiting evaluation, and that's far too many. We don't see a quick solution to this problem, but we are working with a Conference task force to evaluate ways in which this most important activity can be conducted on a current basis.

I've described some of the activities of the NBS Office of Weights and Measures. Let me broaden my view for a moment and describe a few program from other parts of the Bureau. I do this not to blow our horn, but to make a particular point.

NBS has changed quite substantially over its 76 year history, as you might expect. One thing that has remained constant, however, is the involvement of NBS in the search for solutions to major national problems. Last year, for example, we got deeply involved in the trans-Alaskan oil pipeline, a vital part of our plan to reduce oil imports. This pipeline is 1300 kilometers long, and traverses some really challenging arctic terrain. In building the pipeline some 50,000 individual sections of pipe were joined by welding, and each weld was inspected by x-ray techniques.

Analysis of these x rays revealed that many welds contained defects larger than permitted by Department of Transportation regulations. Rather than redo the work, the pipeline builder asked the Department for waivers on 612 welds. In turn, the Department of Transportation came to NBS for technical assistance. We worked on topics ranging from fracture mechanics to photodensitometry, and produced a 318 page analysis in just three months. Using our results and other resources, DOT ruled that all but three of the 612 welds had to be repaired, a difficult, costly procedure. This

repair work has been done, and the oil began flowing late in June.

In responding to the Department of Transportation we had to do an immense amount of work in a very short time. We also had to operate in an innovative mode. For example, we created an in-house task force that cut across institutional lines. We used highly qualified outside laboratories in areas where our staff was overloaded. We worked with the pipeline builder in the field, not in an adversary role but in a mutual effort to solve a technical problem. In other words, we built new relationships that helped us get the job done.

Let me give just one more example. We in this country have an extensive system of voluntary standards. These standards are usually formulated by delegates from the industries involved, with consumers having no voice in the process. Several years ago the consumer columnist Margaret Dana saw that consumer participation in standards setting would ensure credibility and openness in the system. At her suggestion the first consumer sounding board was created in the Delaware Valley. Today there are a dozen such boards nationwide, and in the Washington, D.C. area 4 boards are directly affiliated with NBS.

These groups are composed of men and women from all walks of life, and truly function as sounding boards of consumer opinion. For example, one of the boards in the Washington area was asked for comments on poison prevention packaging by the Consumer Product Safety Commission, and other boards have been sounded on safety questions involving ladders, lawnmowers, and air rifles by ASTM, ANSI and industry associations.

We at NBS are very pleased at the way the sounding board concept is working. The boards are dedicated to promoting and improving the voluntary standards process, and as such are of direct assistance to our Standards Application and Analysis Division. In sum, they are a new approach designed to provide a consumer voice in the standards-writing process.

I mentioned the Alaskan Pipeline project and the consumer sounding boards to emphasize new problems we at NBS are faced with and new approaches we have taken to getting the best possible results.

New problems are not unique to the National Bureau of Standards. Everyone has them, including, or maybe I should say especially, weights and measures officials. New technology, new merchandising techniques, new consumer expectations place an increased burden on all members of this Conference.

And, to stretch your resources even further, new measurement demands are coming your way. Demands in areas outside the traditional definition of weights and measures. For example, we have

already helped state weights and measures laboratories extend their capabilities into the area of temperature and frequency measurement. In this process our Office of Weights and Measures has taken on a new role—that of coupling resources in other parts of NBS to your particular needs. We see this as a very necessary, a very important function.

As you might expect, the Bureau has capabilities in almost every area of physical measurement. This expertise is scattered throughout the organization, both at Gaithersburg and at Boulder. If you have a new measurement problem, let our Office of Weights and Measures put you in touch with the right group at NBS. In this way OWM will keep abreast of your latest needs, and can help you and the proper people at NBS get together and work together most effectively. In essence, OWM can be your entree to all the measurement resources available at NBS, and in other Federal agencies if necessary.

We particularly urge the Conference to help us identify emerging measurement needs and to assist in setting priorities for action. In this way resources at all levels will be coordinated rather than scattered.

I'd like to close by introducing you to a new program that offers a way for even closer cooperation between NBS and state personnel. I'm speaking of the NBS Intergovernmental Personnel Exchange Program. Under this program we invite employees of state and local governments to work at NBS for up to two years. This is not a training program. Rather, it is a collaborative activity aimed at solving problems of clear mutual interest. The work can fall in any one of the Bureau's broad range of technical activities, including basic standards, materials research, applied technology, technology transfer, and on and on.

Once a mutual interest has been defined, a formal Memorandum of Agreement is executed between the sponsor and NBS. This agreement specified the nature, objective and scope of the project on behalf of the sponsor and NBS, and describes the terms and conditions of the relationship between the sponsor and NBS. An individual participating in this Program remains an employee of the sponsoring organization, with salary, fringe benefits, and travel costs negotiated between NBS and the sponsor.

There are many advantages of the new arrangement. Individuals coming to NBS have available to them the full technical resources of the Bureau. They work with recognized experts in their field of interest to make technical contributions that benefit state and local governments and ultimately the public. As a side benefit, a person assigned to this program can serve as a means of communicating state and local views directly to NBS. Finally, they may establish

contacts that provide continuing technical support after their assignment is completed.

I'm sure that this new exchange program will be of direct interest to many of you here today. Brochures that give more detail are available near the registration desk, and I won't be surprised if one or more people from this audience participate in this exciting new program.

To sum up, we at NBS reaffirm our commitment to measurement equity. We view this Conference as an outstanding model of Federal/State cooperation, and are proud of our participation in its activities. We recognize the changing and expanding role of weights and measures officials, and will work with you to meet the emerging challenges. And, finally, we invite you to participate in the new personnel exchange program. Doing so will help solve particular problems and will foster even better understanding and cooperation between NBS and state officials.

MR. ROBERT S. WALLEIGH—COMMITTEE APPOINTMENTS

It is now my privilege to announce the appointment of individuals to serve on the Conference standing committees. I am sure you are well aware how important the work and accomplishments of these committees are to the success of the Conference and to weights and measures administration throughout the nation.

In behalf of the Conference, I would like to express my sincere appreciation to all committee members for their valuable contributions over the year. To outgoing committee members, I offer my special thanks for their loyal service to the Conference.

In accordance with the recommendations of your Conference chairperson, as approved by the Executive Committee, I am pleased to announce the appointments of the following new committee members:

Committee on National Measurement Policy and Coordination:

Mr. Richard L. Thompson, Chief of Weights and Measures, Maryland Department of Agriculture, is appointed for a one-year term to replace Mr. Sydney D. Andrews whose term is expiring.

Committee on Specifications and Tolerances:

Mr. J. Clair Boyd, Supervisor of Weights and Measures, Iowa Department of Agriculture, is appointed for a five-year term to replace Mr. Warren E. Czaia whose term is expiring. Mr. Darrell

Guensler, Assistant Chief of the Division of Measurement Standards, California Department of Food and Agriculture, is appointed for a three-year term to replace Mr. Council Wooten who is retiring from his job with the State of Florida.

Committee on Laws and Regulations:

Mr. Sam F. Hindsman, Director of Weights and Measures, Arkansas Department of Commerce, is appointed for a five-year term to replace Mr. John L. O'Neill whose term is expiring.

Committee on Education, Administration, and Consumer Affairs:

Mr. Robert W. Walker, Inspector of Weights and Measures, Clark County, Indiana, is appointed for a five-year term to replace Mr. Sam F. Valtri whose term is expiring.

Committee on Liaison with the Federal Government:

Mr. Merrill S. Thompson, Attorney for Chadwell, Kayser, Ruggles, McGee & Hastings (Chicago, Illinois), is appointed for a five-year term to replace Mr. John F. Speer, Jr. whose term is expiring.

Ms. Jane S. Wilson, President of Federal-State Reports, Inc. and Editor of "Of Consuming Interest" is appointed for a two-year term to replace Mr. Charles W. Silver who has found it necessary to resign from the Committee.

PRESENTATION OF HONOR AWARDS

Mr. Walleigh presented Honor Awards to members of the Conference who, by attending the 61st Conference in 1976, reached one of the six attendance categories for which recognition is made—attendance at 10, 15, 20, 25, 30, or 35 meetings.

Award Recipients

35 Years

Ralph M. Bodenweiser	Mercer County, New Jersey

30 Years

Edward R. Fisher	Rhode Island

20 Years

Howard E. Siebold	Liquid Controls Corporation

15 Years

E. W. Ballentine	South Carolina
Gerald E. Connolly	Warren County, New Jersey
Mitch S. Godsman	Bennett Pump Company
Lorenzo A. Gredy	Indiana
Sylvia T. Pickell	National Scale Men's Association
Joseph R. Schaeffer	Thurman Scale Company
Chester S. Zmudzinski	St. Joseph County, Indiana

10 Years

David E. Edgerly	National Bureau of Standards
Walter F. Gerdom	Tokheim Corporation
George E. Mattimoe	Hawaii
Andrew B. Moody, Jr.	Richmond, Virginia
Robert J. Morris	Gloucester County, New Jersey
James A. Pollock	Bergen County, New Jersey
John V. Pugh	South Carolina
Walter J. Tusen	New Hampshire
Council Wooten	Florida
Frank G. Yarbrough	Dallas, Texas

ADDRESS

Presented by FRANK MCLAUGHLIN, Acting Director,
Office of Consumer Affairs
Washington, D.C.

You are quite correct, Mr. Moderator, Esther Peterson is very much involved in trying to get Congress to act on the Consumer Agency Bill. As you probably know, she is locked in combat with all of the Trade Associations in Washington, with the exception I believe of one, which means that they're outnumbered. It's a great pleasure for me to pinch hit for Esther and, of course, there was a degree of advance planning as you have heard; however, the advance planning only succeeded in getting me about three hours sleep last night. But, I want you to know that Esther told me that I should be very nice to her friends and that you folks are her friends.

But, I would remind her that I am not exactly a stranger to the Conference, members of the Conference. I'm the same fellow who stood in front of you 10 years ago and told you that I would try to get the Commissioner of F.D.A. to listen to State Officials before the initial Section Four regulation under the Fair Packaging and Labeling Act was proposed. And, I would remind you that I kept my word. And, then I went to the Federal Trade Commission and I got five Commissioners over at FTC before the regulations were put out to listen to and be instructed by and benefit from the advice of officials of this Conference. I kept my word. I know many of you people. I've worked with you before and I feel that I am also among friends.

I'm here today as a kind of historian. Cataloguing a decade of change from the 52nd to the 62nd Annual Convention. I offer these historian's views, if you will, on my own behalf and from my own vantage point and they don't represent the view of the Special Assistant to the President for Consumer Affairs and they don't represent the view of HEW. Simply, because of the fact that we did not discuss them. However, if we discussed them, I think she would come out on the same side as I believe the Department would also. They are my own views and to some extent they spell out a dreary chronicle and perhaps even a frightening chronicle.

Ten years ago, when I worked with members of the Conference and had the responsibility of going out throughout the State explaining the Fair Packaging and Labeling Act as best I could and

attempting to work out solutions to the problems raised and addressed the law, ten years ago at that time I think it is fair to say that American business affected by that law and other consumer protection statutes stood as a bull wire against the concentration of power in Washington in the hands of Federal regulators.

Indeed, many times I was chided by representatives of American business about the fact that the Congress and the Federal branch of Government was taking authority away from the States, cities and countries and traditional areas of state and county and city responsibility. And, at times, business representatives said to the audience, "why listen to this fellow, he represents the Federal Government and they're trying to take authority away from you. And, we in business want to keep the authority at the State, city and county level." That has changed in ten years.

The Fair Packaging and Labeling Act of 1966 marked the beginning of that change. The preemption provision which said that regulations under Section Four had to be the same as the reulations adopted by the Federal bodies, the F.D.A. and the F.T.C. They could not be in conflict, of course, that raised the question, "could they go beyond?," and, we know the decision on that. But certainly the preemption provision of the Fair Packaging and Labeling Act marked a decided change in direction on the part of American business towards responsibility for consumer protection regulations.

The trend continued with the enactment of the Federal Meat Law and Poultry Law, which said the states can only maintain themselves in business if their regulation is equal to that of the Federal standard. But, of course, we know that there was a catch provision in there that said even if it is equivalent of the Federal standard, the State inspection and the State inspected products are not good enough for interstate commerce and we know what has happened to that state regulation over that ten-year period.

The Environmental Protection legislation accelerated the trend towards Federal preemption of State and County and city authority. The Occupational Safety and Health Act of 1970 affirmed a new role for the States. The new role of being permitted to petition the Federal Government to enact State regulations to prove to the Federal authorities that they should be permitted state regulations. The amendments to the Product Safety Act were proposed by American business and they further diminished State authority. We have the confrontation as to whether or not the State of California should be permitted to enact flammable fabrics regulation that is different from that of the Product Safety Commission.

The Medical Device Law preempted State authority, supported by business. The Food and Drug Law amendments strongly sup-

ported by the grocery manufacturers Association accelerates the trend still further and there is now talk of strengthening the preemption provision of the Fair Packaging and Labeling Act. We have come full cycle.

I was asked a week ago to appear on a platform where one of the subjects for discussion will be strengthening the preemption provision of the Fair Packaging and Labeling Act. And, on your program stands strong testimony to the preemptive effect of old laws, old Federal laws which have been rediscovered by industry initiated suits. In truth and in fact, the bullwork against concentration of power in Washington represented by a business philosophy of states rights has in large part disappeared.

The check on Federal authority has now become a goad, a goad to enhance and increase Federal authority. Goaded itself as it is by state consumer protection activity, particularly the State activity of the last eight or ten years. Henry Kissenger last week said, "Most corporations never have a strategy to effect the overall political environment." He said, "businessmen's conception of how to influence government when they are in deep trouble is to send some lobbyist around to promote some limited specific objective that pays off very rapidly." Now his audience did not agree with him and I am not here to debate the question of whether or not his comments apply to the business-reaction to domestic policy particularly policy as regards consumer protection regulation. I am not here to debate whether this new business posture over the last ten years is an ad hoc reactive response or that it is a carefully thought out, well-planned strategy. I am here for a brief moment with you to look at some of the effects of this new posture.

One of the effects is that I am no longer chided by business representatives, business lawyers, business lobbyists about the advance of Federal authority. I don't hear anymore State's rights arguments from the business sector. Another effect is that Washington used to be that little sleepy town on the waters of the Potomac and has now become the Mecca for trade associations. Last year, a small notice came over the wire services. It said, "Washington, D.C., has now surpassed New York City as the home of major trade associations." There is obviously a relationship between this eastward ho and the fact that we have increased in concentration of power in Washington.

We see and we can accept as a result more preemptive proposals addressed to Congress and addressed to the Administration. We can expect more law suits by business challenging the sweep and the scope of State Laws. Congress will have more authority given it and will take a powerful lobby in Washington. And, as fast as Congress gets this authority, they will in turn delegate it down

Capitol Hill to the F.D.A., to F.T.C., to the eight or nine independent regulatory agencies in the seven executive branches independent agencies. They will delegate that authority because the kind of regulation that we're dealing with today is too complex for the Congress to develop fine points itself. So the net effect of this new posture is that more and more authority will be exerted through Congress at the expense of the State and that authority will be in turn redelegated to unelected regulatory technicians, who are already writing most of the law of the land; a situation that certainly was not anticipated by the founding fathers who gathered in Philadelphia a couple of hundred years ago.

Nor, has it been gracefully accepted even by Congress. Congress grows restive at the increasing law-making power that is now exercised of necessity by regulators, federal regulators who are not disciplined by election day results. Sad to say, and it is sad to say, that the effect of this new trend and posture is that State activity on behalf of consumers will diminish. And, this will remove an irritant to those Federal regulators.

I worked at F.D.A., I worked at F.T.C. We didn't like to be goaded. We didn't like to be irritated by what the States were doing and asking us to do and criticizing us for doing. But, we needed it. We needed it, unfortunately, with the pressures on State appropriations and budgeting capabilities emanating from health and welfare. Once we have this sweeping preemption across the land, states will find it increasingly unacceptable to appropriate funds for the enforcement of rules written in Washington in which they had little say.

No one debates the long-term effect or indeed the short-term effect of this new switch, this new shift in our constitutional system and therefore no one proposes alternatives. I am not here to say that the needs of business in uniform regulation should be ignored. That is not my message. My message is that there is a vast middle ground between state authority and district regulation on the one hand and absolute federal preemption on the other hand. And, we haven't explored that middle ground. We haven't debated it. We haven't discussed it.

President Carter who has inherited this new trend is trying to mitigate its effects on consumers by proposing a small office of consumer advocates with the authority to participate in the activities of these unelected federal regulators, to challenge them at times, to challenge them at hearings, and to challenge them in the Federal Courts. Because he believes that this new trend supported by business concentrating all power in the hands of unelected regulatory technicians creates an imbalance in our constitutional system. An imbalance that must be addressed. And, it is not simply addressed

by moving all of the trade associations into Washington. Washington-based lobbies say no to the President. They fight the consumer agency, the consumer office to a standstill. They say no new check is needed on the powers of this new fourth branch of Government. No new check that is other than the most powerful concentration of lobbies ever assembled. Assembled in Washington, D.C.

State regulation and the activitism that we have seen on behalf of consumers of the last ten years and consumers themselves are being and will be profoundly affected by this new posture on the part of the business lobby. But, thus far, state regulators, their activities and consumers have had very little if anything to say about this constitutional shift. Perhaps they are unaware of it. It is clear that state regulation and consumer protection and the needs of consumers should be front and center in this growing change and in the debate over the growing change in our constitutional system and distribution of powers.

I am here today to tell you that the time is right for consumers and state officials, yes, and business too, to ask the question, "where is this trend taking us?"

ADDRESS

Presented by James A. Servin,
Commissioner for Standards, Standard Branch,
Department of Public and Consumer Affairs, South Australia

What I propose to talk about is the progress that we've made in Australia in metric conversion over the last three years—the three years since I was here last. That was my subject when I addressed you in 1974.

Well, the progress in Australia since then has been rather staggering. With the exception of the retail sector, the program is complete. Conversion of the retail sector in my state and in the two federal territories, that is Australian Capitol Territory which is the equivalent of Washington, D.C., and the Northern Territory which is a little bit bigger than one and a half times the size of California is complete. In the other states, it is proceeding along the same line.

Now I'll try and tell you in the next 20 minutes or so how we did this. And firstly, I would thank Mr. Chadsey for his remarks on Monday afternoon when he said that a conversion program

needed strong government backing; it is my firm belief that a conversion program will not get off the ground if it doesn't have strong government backing. It may in the industrial sector but it never will in the commercial or retail sector. Why do I say this? Simply because you can prove to the industrialists that by converting to the metric system and by rationalizing their existing programs, they can save a buck or maybe make a buck. But, there is no way that you can convince the man who sells goods to you that he's going to make an extra dollar or save a dollar by converting to the metric system.

To be sure when he converts he's going to sell you 10 percent more every time you walk into his shop because that's the difference between the customary pound and five hundred grams. But, that doesn't mean to say you are going to use 10 percent more in your household. Over a long period of time you'll still use the same and the end result is he will still sell the same.

The government backing which Mr. Chadsey was referring to was not quite the government backing that we had in Australia. As I understood Mr. Chadsey, he was meaning the politicians must give a strong lead. Well, yes, I must say that in Australia our politicians did give us a lead. They gave us an Act. They established a Metric Conversion Board and at the same time they established a Committee to which Earl referred a few moments ago in the introduction, the Committee called the States Committee for Metric Conversion. Now the function of that Committee was to convert the governments as entities to the metric system in line with the metric conversion program.

But, having done those three things, the politicians stopped as is the wont of politicians. They did not go out on the hustlings trying to whip up public support for metric conversion. I get the feeling here that some people are expecting that they should go out on the hustlings. They didn't do that. Why should they? What is in metric conversion for them? It's not going to win them any votes. It may lose them a few if it's not handled properly but there's no way its going to win them any votes. And, also, the politician is a person who is a follower. He attempts to represent what he believes the public wants. And, he can't do that until somebody has told him that this is what the public wants. Normally, the politician is not a revolutionary because he depends on being reelected in three years time or four years time whatever is your system. So although they gave us strong support in Australia, in giving us the Act, in giving us the Board and in giving us the State's Committee that was as far as they went. From that point on, the politician became purely reactive. Certainly everytime we put a bill up to them, to convert legislation to the metric system, they passed it under certain ground

rules. And the ground rules were, firstly we had an understanding that we would only submit legislation to them which complied with these ground rules and secondly that the amendments would only alter the references in the particular act or in a series of acts from the customary unit to the metric unit by a margin of 10 to 12 percent, but no more. The 10 to 12 percentage being necessary to take care of the difference between the size of the units in the appropriate systems.

So long as we submitted legislation which complied with the set of ground rules, they passed it. If we were ever stupid enough to put up a bit of legislation which didn't comply with those ground rules, they knocked it back. And that happened in my state. No thanks to me but thanks to an overzealous politician who wished at the same time as we were converting to the metric system to alter the political content of an act. In our Parliament which is divided into two houses, the government of course has control over the lower house. But they were in the minority four to sixteen in the upper house. So, they were dependent on at least seven opposition members voting for any bill. As you can imagine, when that particular legislation got to the upper House, it finished up in the wastepaper basket because it contained political matters which were not acceptable to the opposition. The bill was redrafted very smartly to take out the political content and leave in it the metric content which complied with the guidelines. That bill went through as fast as they would have put through a piece of legislation increasing their own salaries, and you know how fast they do that.

What I'm really saying is that the strong government backing in Australia came from the civil servant. I guess the man which Mr. McLaughlin was saying a few moments ago was getting too much power in Washington. And, I don't disagree with him. I think that Civil Service administrators have got to be careful because they do tend to get too much power. But, it was the Civil servant who gave the government backing and how did they do it? Well, there are three areas of government activity which have to be converted. The first one is legislation. The second is the government's procurement policy and the third it's own operation.

In the case of legislation we got our political masters to accept as a policy that all new and amending legislation had to be couched in metric terms. The reason we did this was quite simple. It put an end to the legislation which had to be converted. After this policy was accepted, all new legislation would be metric anyway. So we only had to convert the existing legislation and we only had to convert it if it was live. If you don't know what the difference is between live and dead legislation, I'll give you an example that's purely Australian. I don't know whether it will even apply in

America. But many years ago, they built a Sydney Harbour Bridge, which was the world's longest canterlever bridge, until somewhere in the United States they built one that was a foot longer. The Parliament passed a special Act to establish an authority to build that bridge. Now the bridge has been built for 30 or 40 years. It's dead. What's the sense in changing that Act? That's what I mean by dead legislation.

But we did use legislation as an aid to conversion. Firstly, we made sure when we amended our legislation it was done before the deadline set by the Board for that particular sector's conversion program so there was no impediment in the law to conversion. But secondly, we were more subtle than that. We used it as a tool. If I can give you an example, Australia, until conversion, had 852 different authorities who could approve a building and they all worked on a different code and so you can image the fun that went on in the Australian building industry. Trying to comply with the 852 different masters. We found purely by accident that there was a set of public servants working on a uniform building code, which was to come out in customary units. We applied a good deal of pressure to that group of people to ensure that this legislation came out in metric terms and further to ensure that it only came out in metric terms. The end result was that when this legislation was proclaimed there was no architect who would design a building other than in metric. There was no builder who would build a building other than metric because the uniform building requirements were all expressed metrically. And so, by one action by a group of civil servants, we converted the building industry. We had discussed it with the building industry and they had agreed that it was the best thing to do. So don't think it was so high handed that we just went and did it. Indeed, it was the building industry who told us this legislation was being formulated and suggested we do it.

The second point is procurement. The governments of Australia were collectively the biggest single purchasers of almost anything in the country. We are most definitely the biggest single group of consumers in the country. As it was government legislation under which Australia would convert to the metric system, it became a policy that the government would use its procurement program to aid industry wishing to convert. For example, for a firm to start to make metric screws, before it commences to make them it has to be sure of a market to buy those metric screws. Well, we provided it with that market. We said all government procurement contracts would be progressively converted from customary units to metric units and that wherever possible, from that point on, the government would only buy in metric units. We added that "wherever possible" because you always have to take care of existing

equipment which is in customary units and which is going to go on for some years to come. You've always got to remember that in any conversion program, there will still be ⅜ inch bolts for probably 10 or 15 years until the last piece of equipment that uses ⅜ inch bolts is put in the scrap piles and sent to Japan to be remelted down for steel. If this policy of procurement is used properly, you can save a government a considerable amount of money. Again, if I can give you an example, in 1972, in my State, we decided that all vehicles purchased for the government after February, 1972, would only be bought if they were fitted with a metric odometer and metric speedometer to which was fitted a decal in miles.

This decision was taken because:

1. the road speed program called for conversion throughout the whole of Australia as from 1st July, 1974.

2. we had a policy of replacing Government cars every two (2) years.

At the end of June, 1974, we had reached a stage where every government vehicle in the State of South Australia was fitted with a metric speedometer and a metric odometer at no cost to the government. We had replaced all the vehicles at least once in that period of time. And so when we went into the era of metric speed signs and metric distance signs on roads, our officers were equipped with metric vehicles.

The third thing we had to do was to convert our own operation. And that's probably the hardest thing because really what that means is that you are going to convert your own thinking from one system to another. Once you have converted your thinking, you find that the problems you see in the early stages don't really exist. In the attempt to convert our own operation, we attempted to obtain uniformity wherever possible because we've got a country as big as the United States in area. We've only got 6 states while you've got 50, I think it is now. But even so, in the past that meant 6 different policies on anything—where you may have had 50 different policies. So, we attempted to get uniformity. But, the first thing that we had to learn was that uniformity is not possible in all things. It is not warranted in a lot of things. Secondly it is not possible of attainment in the time slot available in quite a few things and thirdly there is really only a comparatively small area in which you can hope to attain uniformity in a time slot of 2 to 3 years. Again, if I can give you a couple of examples, we ensured that the maximum permitted width of a vehicle in Australia was the same throughout the whole of Australia after conversion, which it had not been before. We never attempted to ensure that the road

widths were the same throughout the whole of Australia. Because we argued quite simply that vehicles cross state border, roads do not. It was a very worthwhile exercise. At times it was a very frustrating exercise. We won a few battles. We lost a few battles. And, I can assure you they were battles. Because there's always someone so entrenched in their parochial viewpoint, that they can't see the wood for the trees. There's always a person who says "my system and the way we do it is the only way to do it." Invariably that person hasn't really thought in any depth what his system does anyway, but he takes that view just the same.

I believe the major single reason why we've achieved conversion so quickly in Australia was because we took a positive attitude. We did not wait for public opinion polls to show us that 50 percent of the population favored metric conversion. Rather, we looked at the opinion polls the other way around and said provided there is not 50 percent of the population that is opposed to metric conversion we go ahead. And it was not until almost the end of 1975 that we got an opinion poll which showed that more than 50 percent of the Australian population thought metric was a good thing. Until that time, we'd have figures saying 25 percent thought it was a good thing, 25 percent thought it was no good and 50 percent didn't know. And those figures varied over the years. We never had a figure higher than 25 percent opposed to it. But it took 5 years for us to get a figure that showed 50 percent of the population thought it was a good thing.

Now I was horrified when I first came here on this trip to find that the American road sign program was put off because the population was not in favor of it. How can you expect them to be in favor of something they do not know, something which is entirely foreign to them, and something for which you have not educated them?

In the early days of our conversion, we proceeded to change the packaging law or rather to give notice that we were going to change the packaging law. And contrary to the attitude which I heard expressed in this hall on Monday afternoon, we accepted the challenge and told industry the rounded metric sizes that we would like to see them go to. Before we said it we talked with and listened to industry, we listened to consumers, we heard everyone that thinks they know, then we said this is what we suggest and we give you 4 years notice from now that this is what the law will eventually require. Or rather we'll give you 4 years notice from now, the law will be changed to provide and require a statement in metric terms. Whether you put an imperial statement on after that date is up to you, but you must have a statement in metric terms.

By and large, industry accepted it and followed our advice. Why? Simply because they like everyone else were groping in the dark and they accepted the expertise which we claimed to have in this field as Weights and Measures authorities. And we did not abuse that acceptance by industry.

And then, of course, it comes to the Weights and Measures legislation itself. It is my belief, it is more important for you to change your weights and measures legislation throughout the country if you wish to convert it to the metric system, than to spend any number of dollars or millions of dollars on education programs to educate the public to metric. Because in the final analysis, all that you really need to do to convert a country is to change its weights and measures law. It would cause chaos but that's all you need to do. Now obviously you do move to prevent the chaos. But education will never convert a country on its own. And I'll give you some examples. One is when France first went to the metric system in the 1790's and I think it was in 1834 it finally had to pass a law outlawing the use of the customary system. And a second example, the United States of America. Since about 1866, the American law has required or rather permitted the use of the metric system. You don't see much use of it now after 110 years, do you? We established criteria for devices so that manufacturers could make devices in the metric system. We established criteria for conversion of devices so they knew what they had to plan. And then we established cutoff dates and I guess this is where we part company completely from you. Because we accepted, we were forced to accept, that while you can convert an industry voluntarily, you cannot convert the retail sector voluntarily. Indeed, the retail sector has never been able to voluntarily choose the unit it could use. If you cast your minds back, history shows that one of the first arms of government ever established was the weights and measures service. In a very crude form in the first place. But in early times, a man took a stone which he picked up off the ground and used that as his comparison in weight when he wanted to bargain. And, trouble occurred because one man's stone was different from another man's stone. Or because one man wished to use a large stone when he was buying and a small stone when he was selling. And so the tribal leader of the day had to say you will use my stone, that will be the standard. Now and ever since then, governments have told people what system of weights and measures they will use. If you don't do that, you will have chaos. I'll tell you what happened in our country when we tried it.

We had some businessmen who converted to the metric system voluntarily and immediately they faced a drop in turnover of 50 percent in their trade. Why? Because suddenly their prices appeared

to be 2.2 times higher than the man next door who had not converted. Or, if that man next door who had not converted was also a sharp cookie, he was able to lift his prices a little bit and take an extra bite of cream off the cake and still appear at least twice as cheap as his partner. Eventually, the retail sector came to us and literally begged us to make conversion in the retail sector mandatory. They said if you want us to convert we are willing to convert but it has got to be on the basis of everyone in the area at the same time or else the legitimate traders cannot survive. Now, that may sound farfetched to you in a country which makes a great play of voluntary action. But, I suggest you think about your own system and ask yourself, how voluntarily do you pay your taxes? How voluntarily do you stop when a policeman tells you to stop because you have broken some road law? There are certain matters of government which have never been voluntary. And, I would submit that weights and measures is one of them.

Now, I'm not trying to tell you how you should convert. If America converts, that's America's business. What I am saying is how we converted. And, we were able to do it in a short period of of time. Our government passed the bill in 1970, in March, 1970, and now July, 1977 it is virtually completed.

ADDRESS

Presented by Hon. Reagan V. Brown, Commissioner, Department of Agriculture, State of Texas

(Commissioner Brown presented a very interesting and humerous talk during the Conference—only the highlights of his remarks were submitted for publication)

I didn't come here today just to talk about Weights and Measures. I want to tell you how proud we are of you. The state officials that have to do with Weights and Measures must continually fight the encroachment of other agencies who would either like to do your job or prevent you from doing it.

We must protect the integrity of our state weights and measures jurisdictions and get on with the enforcement of state laws designed to protect the consumer.

Few consumers ever realize the full importance of the work you do nor the many ways in which you touch their lives. There is vir-

tually no commercial transaction carried out in this country that, at some point, does not involve weights and measures.

I must offer my congratulations to you for tackling some of the problems facing your profession with a firm resolve to find some answers.

One of those issues most pressing for your attention is the recent decision by the Supreme Court in the Rath bacon case. It is imperative that you initiate in-depth, detailed studies to find the means to enable states to get back in the package inspection business.

As you know, last May the Supreme Court in two decisions upheld a district court ruling that the State of California cannot establish more stringent weight labeling standards than those created by the federal government.

Following that decision, which prevented individual jurisdictions their right to legal action against those disregarding state laws, many jurisdictions dropped their package inspection programs. This conference has a grave responsibility to take the necessary steps to fill this void in our service to this country's consumers.

This is an issue which I feel is extremely germane to the economic well-being of the taxpaying citizens of this nation who also play the role of retail consumers.

The fundamental issue is this:

Do we continue to tell the American public the precise truth in the quantity representations which are used in the retail marketplace, or not?

If government at any level takes any action which falls short of insistence that the American consumer be told the very precise truth about what he is receiving in return for his money, I would suggest that that action will ultimately erode the credibility of both government and the business community.

Precise, accurate, and truthful quantity representations in trade and commerce are essential to the continuance of the Free Enterprise System, and about this we should make no mistake.

Citizens in increasing numbers are questioning the food system in this country and government's role should be in answering those questions, not furthering their confusion. This certainly does not seem an opportune time to take action which would, in effect, dramatically curtail a nationwide regulatory mechanism which for many years has assured the American consumer of truthful, accurate net weight on the retail shelf. Historically, our weights and measures laws have supported the premise that full net weight on the retail shelf is the right of every consumer. I stand behind that premise.

We need cooperation from all levels of state and federal govern-

ment to find a realistic, workable solution to the problem. Cooperation is a two-way street and there has to be a steady flow of communication between the Office of Weights and Measures and the members of this Conference if we are to develop standards which will apply across state lines.

REPORTS OF STANDING COMMITTEES

REPORT OF THE COMMITTEE ON NATIONAL MEASUREMENT POLICY AND COORDINATION

Presented by S. D. Andrews, *Chairperson;*
Director, Division of Standards, Department of Agriculture, and Consumer Services, State of Florida

(Wednesday, July 20, 1977)

The Committee on National Measurement Policy and Coordination (P & C Committee) submits its final report to the 62nd National Conference on Weights and Measures (NCWM). 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 open meeting of the commitee.

Note: To provide a clear understanding of the actions taken by the members of the NCWM with respect to the Supreme Court decision (last item of this report), the recommendation is printed as it was presented to the Conference, all paragraphs which were amended from the floor have the added material underlined and the portions which were deleted or modified by amendment are shown lined out.

VOTING PROCEDURE

During the past year, the National Bureau of Standards has been asked to review the NCWM voting procedure to determine if it still fulfills the needs and desires of the Conference members.

The voting procedure has been a recurring issue before the Conference. A special task force reported to the Conference in 1957 on the voting system and the matter was studied and reported on by the Executive Committee in 1970. The 61st NCWM modified the voting procedure by requiring all voting to be by either a show of hands or a standing count (eliminating a voice vote) of voting delegates. Many members did not believe the issue was resolved and pressed for additional changes. Suggestions and recommendations continued to be received by the National Bureau of Standards.

To analyze the issue Dr. Ambler, Acting Director of NBS and President ex officio of the NCWM, conducted a survey to learn the opinions of a cross-section of weights and measures officials. The survey results indicated a general desire to change the voting procedure, but there was a lack of consensus of what changes should be made. The comments received with the survey clarified major areas of concern and aided in reviewing potential voting procedures.

As a result of the many diverse suggestions, a voting procedure was developed which addresses many of the concerns held by weights and measures officials. The proposal was considered by the P & C Committee and reviewed and modified by the members of all standing committees during the interim meetings. On their recommendation, the proposal was referred to the Executive Committee for approval to be included in the tentative report and to provide time at the NCWM for discussion. Having received the approval of the Executive Committee, the proposal was presented for further analysis.

The proposal can not be presented for final adoption and implementation this year in accordance with the NCWM Organization and Procedures. If the Conference members deem appropriate, a final vote could be taken in 1978 at the 63rd NCWM on the new voting procedure. The voting procedure could be implemented at that time if the membership approves.

The procedure attempts to resolve the issues which have been raised. It was developed from the suggestions of weights and measures officials and examination of procedures used by other organizations. While not all viewpoints could be incorporated, many of the basic concerns have been answered. A compromise was necessary to appeal to officials at both the State and local levels and preserve their participation in the NCWM. Comments and suggestions received with Dr. Ambler's survey specified certain aspects which must be considered in any new voting procedure, such as:

1. New procedures should prohibit "packing the Conference" by any one jurisdiction.

2. Participation of all State and local weights and measures officials should be encouraged and perpetuated. All weights and measures officials should be allowed floor and voting privileges.

3. Economic and geographic bias due to travel restrictions and Conference location should be eliminated.

4. Conference actions should represent national consensus since the Handbook 44 specifications and tolerances, model laws and model regulations are to be national standards promoting national uniformity.

5. The voting procedure should reflect the basic structure of authority in the diverse weights and measures organizational structures existing in the United States.

6. The votes of each State should be recorded.

To respond to these suggestions, the new procedure proposes a bicameral or "two House" voting structure. For descriptive purposes, the Houses will be called the "House of State Representatives" and the "House of Delegates."

VOTING CONSIDERATIONS

1. A primary consideration incorporated into the proposed voting procedure that follows, requires any action taken by the NCWM to reflect the majority opinion of the States. This prevents any one State, local, or geographical area from controlling a Conference without a national base of support.

This consideration excludes a voting procedure patterned after the House of Representatives. While the House of Representatives reflects the population distribution of the country, it does not accurately represent the State differentiated weights and measures organizations. The weights and measures enforcement programs within each State generally reflect the problems, priorities, and population of the State.

2. Each State will designate one official to serve as its representative at the NCWM. The District of Columbia and the U.S. Commonwealths and Territories that have weights and measures programs similar to the States (for example, have followed the model laws and regulations and have adopted Handbook 44) will also be allowed to designate a representative. This body of officials will be known as the "House of State Representatives."

A comment was received inquiring if a designated State representative could designate a member from another State jurisdiction to cast his vote if he were unable to attend the voting session. This would not be permitted since Item 4 prohibits a proxy vote. If other members from the jurisdiction of the State representative are present, the State representative may appoint an alternate by contacting the Credentials Committee and fulfilling the necessary requirements that may be established for this purpose. It is the intent of the committee that a jurisdiction be represented by a weights and measures official from that jurisdiction.

3. All other State and local weights and measures regulatory officials will be grouped as a body and known as the "House of Delegates."

4. A proxy vote will not be permitted. Since issues and recommendations in the committees' tentative reports are often modified and amended at the Conference, the attendance of officials at the NCWM annual meeting is vital.

5. It is intended that the issues will be thoroughly discussed between State and local officials at State and regional conferences and meetings before the NCWM and the days preceding the vote at the NCWM. It is important to have both State and local representatives at the voting sessions and that both groups take advantage of whatever opportunities are available to caucus at the NCWM to assure a clear and complete understanding of the issues.

PROPOSED VOTING PROCEDURE

Several comments have been received which question the appropriateness of the quorum requirement contained in the original proposal. A possible weakness in the original proposal of the P & C Committee is the possibility of a number of State representatives walking out of a vote and, thus, defeating an issue by not having a quorum present. A popular issue which would otherwise pass could be defeated by a procedural restraint. Therefore, the quorum requirement has been examined and changes proposed but the two-house approval requirement for an item to pass has not been changed.

The original intent of the voting procedure was to assure a national consensus on an issue. This was achieved by requiring adequate representation through a quorum requirement and the issue being decided by a majority vote. This would have permitted an issue to pass by a 19 to 18 vote based on a quorum of 37 (70% of 53) in the House of State Representatives.

Since the intent of the designated State representatives' votes was to assure a national consensus, this can also be achieved by simply requiring a minimum of 27 favorable votes required to pass an issue in the House of State Representatives. This eliminates the need for a quorum but makes it more difficult to pass an issue. However, this is considered appropriate and we recommend that in the House of State Representatives a minimum of 27 votes supporting or opposing an issue is required to pass or fail an issue. The quorum requirement should then be dropped. An issue which does not receive the minimum number of votes is returned to the standing committee for further consideration.

The intent of the House of Delegates procedure is to assure a consensus opinion of weights and measures officials on an issue. An additional consideration is to provide representation while prevent-

ing a relative small group from controlling a vote by "packing" the vote in the House of Delegates. This could occur when the number of delegates in the House of Delegates is much smaller than the number in the House of State Representatives. While this occurrence may not be likely, this problem can be circumvented by requiring the minimum number of votes cast in favor of or in opposition to an issue also be 27 in the House of Delegates to pass or fail an issue. If more than 54 votes are cast, the issue is decided by a simple majority. Should a tie vote result or if the minimum number of votes to pass or fail an issue is not cast, the issue will be decided solely by the vote of the House of State Representatives.

Thus, an issue must pass both Houses to pass at the Conference. The exception to this rule occurs when insufficient votes are cast in the House of Delegates. If a split vote results or if the minimum number of votes is not obtained in the House of State Representatives, the issue is returned to the standing committee for further consideration as specified in the procedure given in the tentative report.

These recommendations maintain the principles of a voice for all weights and measures officials, the requirement for national consensus, and a balance between the two Houses.

Therefore, the committee recommends this section be adopted as it appears below:

1. Form a Credentials Committee:

   (a) The committee will recommend and administer NCWM rules and procedures to carry out the voting process and make decisions concerning disputed rights of designated representatives.

   (b) Three-member committee (one State—one county—one city)

   (c) Three-year rotation (one on—one off each year)

   (d) Appointed by the NCWM chairperson

2. The State weights and measures director shall be the designated State representative unless he designates some other State or local official.

   (a) Each representative will be specified annually to the Credentials Committee 30 days before the NCWM annual meeting. Provision for exceptions to this deadline will be allowed.

   (b) An alternate shall be named prior to the NCWM annual

meeting in case the designated representative cannot attend.

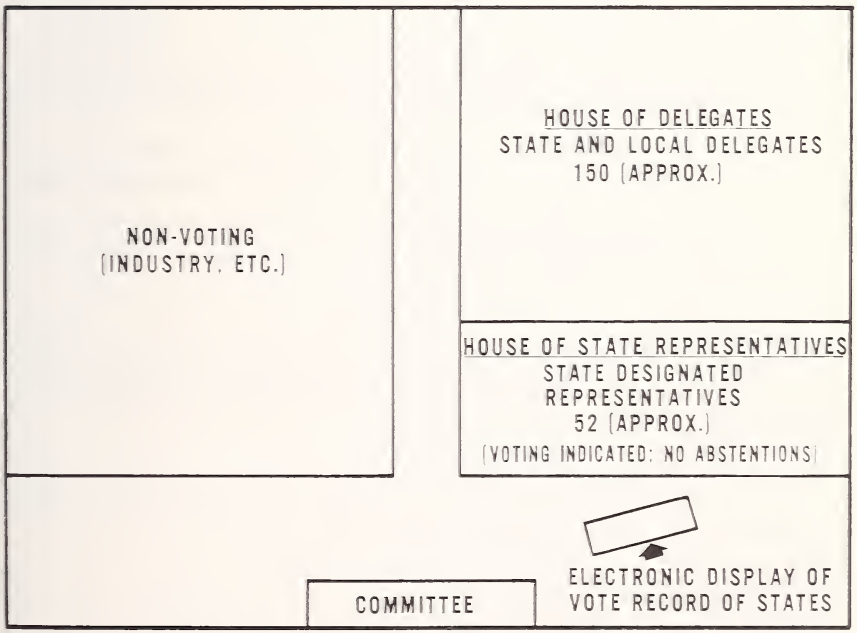
3. In the House of State Representatives, a minimum of 27 votes must be cast in favor of or in opposition to an issue to pass or fail that issue.

4. In the House of Delegates, a minimum of 27 votes supporting or opposing an issue must be cast to pass or fail that issue. If more than 54 total votes are cast, the issue shall be decided by a simple majority. Should a tie vote occur or if the minimum 27 votes in support of opposition are not cast, the issue shall be decided by the vote of the House of State Representatives.

5. All voting will be by a show of hands, standing vote, or machine (electronic). No voice voting.

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

7. Roberts Rules of Parliamentary Procedure shall be used unless different rules are otherwise specified.



8. Seating:

(a) Day of voting only

(b) Control of placement and movement of all attendees

(c) Monitors for vote count

(d) The voting arrangement will be designed to permit recording the votes of the State representatives whether an electric system, show of hands, or standing vote is used. Voting by both groups will be simultaneous.

9. Committee reports—alternatives that may be used in voting on the reports:

(a) Vote on the entire report

(b) Vote on grouped items or sections

(c) Vote on individual items:

(1) at committee discretion

(2) on request by voting delegate with support of ten others

10. Floor amendments—generally discouraged:

(a) Committee chairperson will be allowed to offer amendments during the day of voting to make editorial changes in their final reports.

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

(1) two-thirds of the voting delegates of each "House" must agree to debate a proposed amendment, and

(2) a two-thirds favorable vote of each "House" on the amendment is required for passage.

VOTING RESULTS

In order to reflect the proposed changes to the "Proposed Voting Procedure" section, the committee recommends adopting the sections shown below.

After a motion and a second, call for a vote (Yea/Nay)—show of hands, standing, or electronic vote:

1. Motion accepted IF:

(a) a majority of the members of the House of Delegates votes Yea (a minimum of 27 Yea votes required);*

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

And If

(b) a minimum of 27 members of the House of State Representatives votes Yea.

2. **Motion rejected IF:**

(a) a majority of the members of the House of Delegates votes Nay (a minimum of 27 Nay votes required);*

And If

(b) a minimum of 27 members of the House of State Representatives votes Nay.

3. **Split Vote:**

When the two groups split on an issue or the minimum number of votes supporting or opposing an issue is not obtained in the House of State Representatives, the issue is returned to the standing committee for further consideration. The committee may drop the issue or reconsider for submission the following year. The issue cannot be recalled for another vote at the same Conference.

(The foregoing items were presented as a proposed voting procedure to be studied over the next year. The items were adopted as a proposal by majority vote.)

POLICY

The number of issues being submitted to the standing committees for action is becoming so large that the issues cannot always be adequately studied and prepared for Conference consideration. A realistic approach to effectively deal with issues which are presented to the standing committees of NCWM must be established. This is necessary to assure a manageable workload and to adequately analyze each proposal. The time limitations at the Conference and for the standing committees require the number of issues to be dealt with each year be limited.

To assist the standing committees to deal with the issues before them, the P & C Committee requested the Liaison Committee to developed guidelines for a policy statement concerning the submission of proposals. The policy statement adopted by the 55th NCWM in 1970 included this subject. The 1970 policy statement has been

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

reviewed and changed to include the Liaison's Committee's recommendation as follows:

Policy on Procedures of Standing Committees

Due to the demands placed upon the standing committees of the National Conference on Weights and Measures from the standpoint of greater volume of proposals and ever widening scope of weights and measures activities, the following guidelines shall be adhered to by those organizations and individuals who submit proposals for consideration by NCWM.

1. *Interim Meetings.*

(a) An interim meeting of the standing committees of the NCWM shall be scheduled approximately five months (usually in January) prior to the annual Conference meeting.

(b) All proposals to be considered by a committee for action during the upcoming Conference shall be presented in writing to the Committee 60 days (usually by December 1) prior to the interim meetings.

(c) Proposals should contain a concise statement of the problem and clearly outline the purpose and national need for its consideration.

(d) Proposals should include the submission of adequate background material including test data, analysis of test data, or other appropriately researched and documented material from which a committee will be able to make a suitable judgment for either a firm recommendation or to consider the need for further study. When possible, solutions to problems shall be proposed and stated in specific language in amendment form to Conference documents.

(e) Weights and measures officials are encouraged to utilize their regional associations for initial exploration of issues and to use the resources of all member States within that regional association to assist in the development of well documented proposals where applicable.

(f) If a proposal involves a new area of weights and measures activities, it would be appropriate to make recommendations for both regulations and test methods to provide for proper enforcement.

(g) Tentative agendas listing the issues which may be discussed by the committees during the interim meetings should be available upon request from the Office of Weights and Measures thirty days (usually by January 1) prior to the interim meetings.

(h) Upon request, committees will hold hearings for presentations by government officials, industry representatives, or consumer groups during the interim meetings. Requests for hearings must be received at least two weeks prior to the start of the meetings so scheduling can be arranged.

2. *Tentative Reports.*

(a) Matters under consideration by a committee, and upon which it offers comments or recommendations for action by the Conference during the annual meeting, shall be included in the committee's tentative report as published in the Conference Announcement.

(b) The Conference Announcement shall be prepared and distributed approximately three months prior to the annual Conference meeting.

3. *Comments on Tentative Reports.*

(a) Written comments and suggestions by weights and measures officials, industry representatives, and all others on items in the tentative report shall be encouraged.

(b) All comments and suggestions on the tentative reports shall be submitted to the Conference Executive Secretary no later than one month preceding the opening of the National Conference meeting. This schedule provides a two-month period for consideration of the tentative reports by all persons and allows the committees the necessary time to study and consider the comments received prior to the Conference opening.

(c) Except by unanimous consent of the Conference, the proposal of new or additional items shall not be accepted (see 6b that follows) by a committee after the interim meeting and publication of its tentative report for action by the forthcoming Conference. However, such items may be offered for discussion and future consideration by a committee during the open committee meeting that is held during the annual Conference.

4. *Open Committee Hearings—Annual Conference.*

(a) Each standing committee shall hold an open hearing during the early part of Conference week for the purpose of hearing discussion on all items in its tentative report, as well as those items suggested to the committee for consideration during the following year.

(b) Those who wish to speak before the Conference on a specific issue during the open hearing should advise the committee chairperson or Conference Executive Secretary of their intent as far in advance of the hearing as possible to aid in scheduling such appearance in the time available.

5. *Final Committee Reports and Conference Action.*

(a) Following the open hearings, each committee shall prepare its final report for action by the voting membership of the Conference later in the week. Copies of each final report shall be made available for study prior to the session during which it is presented and acted upon.

(b) The chairperson of each committee shall present the final report of the committee to the Conference body. A vote shall be taken on individual items or sections in the report as circumstances require, and on the entire final report as presented in accordance with established Conference voting procedures. Parliamentary procedure according to Roberts Rules of Order shall be adhered to in the presentation of and action on standing committee reports. Time limitations on the discussion of a question or amendments may be imposed by the presiding officer as required.

6. *Exceptions to the Above Policy.*

(a) Circumstances beyond the control of those responsible may cause slight changes in the time schedules outlined in this policy. If necessary, allowance for such changes shall be announced by the committees.

(b) A committee may be obligated to accept a new item for study and recommended action after the interim meeting and publication of its tentative report to meet an emergency situation. (For example, to comply with actions of Congress or other arms of the Federal Government which impact on the field of weights and measures.) It shall be the responsi-

bility of the committee to decide which new items justify emergency action and to request unanimous consent of the Conference for such action.

METRIC

During the past year, the P & C Committee received a report on the activities of the Weights and Measures Sector Committee of the American National Metric Council (ANMC). This Sector Committee has identified weights and measures areas which will require change as the nation adopts the SI measurement system and has outlined a schedule and procedures to aid in metric conversion. The P & C Committee agrees this activity is an asset to weights and measures officials and industry and supports continued NCWM participation in ANMC.

The committee received a report on the status of the U.S. Metric Board. Since the appointments made by former President Ford were not confirmed by the Senate last year, President Carter will be reviewing the list of appointees and will nominate his own selections to the Board.

The P & C Committee believes the appointment of a weights and measures representative to the U.S. Metric Board is vitally important. Since the Conference continues to support the appointment of Syd Andrews, a letter re-stating NCWM support for him was sent to President Carter by Earl Prideaux, NCWM Chairperson. The letter is reprinted in this report for the benefit of all weights and measures officials.

January 25, 1977

The President
The White House
Washington, D.C. 20500

Dear Mr. President

In September 1976, former President Gerald Ford nominated Sydney D. Andrews, Director, Division of Standards, Florida Department of Agriculture and Consumer Services, to serve as a member of the U.S. Metric Board. This Board is to be established under the Metric Conversion Act of 1975, Public Law 94-168.

Mr. Andrews was nominated by the National Conference on Weights and Measures, an organization comprised of over 3,000 State and local weights and measures regulatory officials. His nomination was made for the position on the U.S. Metric Board specified in Section 5(b)(2)(I) of Public Law 94-168 which states:

> ". . . one to be selected from a list of qualified individuals recommended by the National Conference on Weights and Measures and standards-making organizations."

The American National Standards Institute and the American Society for Testing and Materials were among many other organizations in both the public and private sectors which supported Mr. Andrews' nomination.

Former President Ford's nominations were not considered by the Senate in 1976 and are, therefore, likely to be under your review before further action is taken. The purpose of this letter is to reaffirm to you our support for Mr. Andrews' nomination to the U.S. Metric Board.

I hope you will agree with the National Conference on Weights and Measures that Mr. Andrews is highly qualified to serve in this important position.

(Signed)

Earl Prideaux, Chairman
62nd National Conference on Weights and Measures

As part of the voluntary conversion to metric, the capability of scales to indicate in both U.S. customary and metric units is becoming a common technology. Guidance for the measuring device industry will be required with respect to new specifications and international specifications relating to metric devices. Much of this guidance will be provided through metric specifications included in Handbook 44. For an overview of the considerations involved in the development of metric criteria, during its open hearing, the committee heard a report by Mr. Otto Warnlof of the NBS Office of Weights and Measures on the subject, "Critical Path for Handbook 44 Metric."

Mr. Warnlof's report illustrated a few of the considerations involved in the process of developing a metric Handbook 44. The development of requirements for metric equipment includes decisions in the area of U.S.–OIML conflicts; that is, whether to accept, question, or reject the OIML philosophy. Examples of this are tolerances (scale divisions vs percentage of load), operating characteristics (rate of flow—10:1 vs 5:1), minimum capacity and minimum delivery (40 d_1 and 0.5 gal), least significant decade always active (0.01 t not 10 kg and 0.01 kg not 10 g), and marking (IN and EX vs T.C. and T.D.).

Decisions will also be required to determine if test procedures require revision and if standards should be metric equivalents,

metric supplements, or SI units. This requires establishing the proper denominations for weights. The handbook format should be reviewed to determine if a single manual or if prototype and field manuals should be developed and the structure it or they should take.

The development of sections and chapters to Handbook 44 should be considered to make the document more efficient and to reduce the cost. The process to develop a metric Handbook 44 will include identifying interested parties, necessary changes, and existing standards and conflicts, developing formal consensus, field standard specifications, and test procedures before drafting and circulating codes for adoption by the NCWM.

The committee expresses its appreciation to Otto Warnlof for his excellent report.

TASK FORCE ON NATIONAL TYPE APPROVAL PROGRAM

The Conference last year demonstrated its support for the NBS prototype examination program by adopting a policy statement encouraging its use. Many States and manufacturers have called for increased NBS support of this program to eliminate the backlog and the extended time required for examinations.

In view of the problems surrounding this program, the P & C Committee has given its endorsement to the NCWM Chairperson and the Executive Committee to form a "Task Force on National Type Approval Program" to assess the situation. The task force study would include a review of the concepts and operations of both the NBS prototype examination program and the State type approval program. The task force would ultimately recommend a course of action to strengthen both programs or to establish new ones.

The task force will consist of a representative group of weights and measures officials from the various regional associations and industry representatives. The composition, objectives, and approach of the task force which has been established by the Conference Chairperson to serve on a tentative basis is presented in the following outline:

1. *Membership*

Western:	California
	Oregon
Southern:	Arkansas
	Maryland

Northwest:	Michigan:
	Minnesota
Northeast:	New York
	Pennsylvania
NCWM:	Conference Chairperson
NBS:	OMW
Industry:	(Associates as appropriate)
	Scales—SMA
	NSMA
	Meters—GPMA
	Meter Manufacturers
	Other Devices—Mileage Measurement

2. *Purpose*

- To study and evaluate present and future needs for a National Type Approval Program
- To develop parameters for such a program
- To develop a model program with viable alternatives involving Federal/State/local governments and affected industry viewpoint
- To promote the adoption and implementation of the program that is finally agreed upon as being the most practical, workable, and effective approach

3. *Timetable*

- By July 1977 (NCWM)—Report on organization and progress
- By January 1978 (Interim NCWM Meetings)—Progress report
- By July 1978 (NCWM)—Draft plan discussed
- By July 1979 (NCWM)—Action on proposed program

4. *Approach*

a. NCWM Chairperson, with consent of the Executive Committee, calls for creation of the task force. (accomplished)

b. NCWM Chairperson designates a State official to organize and chair the task force through its initial establishment and until a more formal arrangement by the Conference can be implemented. The task force would operate within the framework of the NCWM to maintain its "national" scope and direction. (Mr. Delfino, California, is serving as temporary chairperson.)

c. Membership is to be contingent upon approval of respective organizations and individuals as suggested.

d. Develop an outline of particulars and stepwise approach plan for the task force to follow.

e. Review the NBS/OWM program and those of several States (notably, California, New Jersey, New York, and Pennsylvania).

f. Survey the States (and local jurisdictions as appropriate) and industry for ideas, suggestions, recommendations to get a data information base and national consensus on the subject.

g. Communicate and coordinate all efforts toward the development of recommendations and an ultimate solution of problems in this vital program.

During its open hearing, the committee heard a Task Force progress report presented by Mr. Ezio Delfino, Chief of the California Division of Measurement Standards. The Task Force has identified some of the problems facing this project. Some of these are:

1. No State jurisdiction is willing to give up its veto power or, at least, not until a new system has proven its credibility.

2. There is a need to develop clear definitions of test procedures and criteria.

3. The National Bureau of Standards must raise its profile, achieve adequate funding and staffing, and play a central role in this system. That role can be either one of coordination, actual testing, or both. A nationwide system cannot be implemented without some kind of active participation by NBS.

4. Communications among industry, States, local jurisdictions, and NBS must be improved. Some of this can be established by better staffing by NBS.

5. State and local jurisdictions *must* have meaningful input in developing and maintaining such a system. Without that assurance, a national type approval system will not work.

Some options which can be considered for a national type approval program are:

1. Could NBS certify States to do nationwide type approval? They certify laboratories, why not type approval programs?

2. With NBS acting as a clearing house, could one State conduct prototype examinations and another perform the field testing?

3. Is it feasible to have an advisory committee made up of Federal, State, local, and industry personnel serve to set up whatever rules or procedures are necessary—with no one jurisdiction having a veto power?

These are some of the possibilities to be explored. Mr. Delfino stressed the need for cooperation among all jurisdictions to make any national type approval program a success.

The committee encourages the Task Force to continue its activities to develop recommendations for a national type approval program. The committee commends Mr. Delfino and the Task Force for the progress it has made.

OIML REPORT

The NCWM representative to the International Organization of Legal Metrology (OIML), Jim Lyles of Virginia, presented his report to the P & C Committee on the Fifth International Conference of Legal Metrology. The report covered a wide range of topics. OIML activities are moving forward on many fronts and, therefore, are reported by other committees as NCWM participation is exercised. Mr. Lyles participated in the discussions with the other committees to assist them in developing their OIML issues.

Due to the length of Mr. Lyles' complete report, excerpts which relate specifically to weights and measures in the United States and which are of particular interest to participants in the NCWM are included in this report for information purposes. Weights and measures officials with questions on specific issues or interested in further information are encouraged to contact Jim Lyles directly.

Fifth International Conference of Legal Metrology
Paris, France

October 6-12, 1976

The International Organization of Legal Metrology (OIML) was established in 1955 for the purpose of reaching international agreements on standards for measuring instruments and methods of measurement. These instruments and methods are intended for use in measuring products and commodities that are traded between nations or that may be subject to internal legal requirements. The United States joined the OIML Convention in 1972, and the Department of Commerce was delegated the responsibility for managing U.S. participation in the organization. This responsibility was assigned to the National Bureau of Standards.

The technical activities of OIML are conducted by 30 Pilot Secretariats,

each of which has several Reporting Secretariats, adding up to a total of some 160 secretariats in all.

For example, Pilot Secretariat 6 deals with the measurement of gas volumes, and Pilot Secretariat 7 is concerned with the measurement of masses. Within Pilot Secretariat 6, each of twelve Reporting Secretariats deals with a special aspect of the Pilot Secretariat's field, while Pilot Secretariat 7 has seven Reporting Secretariats. Any member country that wishes may participate in the work of any secretariat.

The principal function of each secretariat is to prepare draft recommendations for standards needed in its own field. The drafts are circulated to all member states for comments and ultimately for a vote on acceptance. If the draft is considered acceptable, the recommendation is next presented to the International Committee of Legal Metrology (CIML), a sort of board of directors comprised of representatives of all member states, which guides OIML between Conferences. If approved, the draft is published as a recommendation of the Committee. Finally, it is presented to the next meeting of the International Conference of Legal Metrology for a formal vote of governmental representatives.

Of the 43 member states of OIML, 34 sent delegates to the Fifth International Conference of Legal Metrology. The members of the United States delegation were:

Name	*Representing*
E. L. Brady	NBS (Head of Delegation)
W. E. Andrus, Jr.	NBS (CIML Member)
D. E. Edgerly	NBS
J. F. Lyles	National Conference on Weights and Measures
A. G. Smith	Scientific Apparatus Makers Association
A. H. Hall	American Petroleum Institute
W. Salmon	Science Attache, U.S. Embassy, Paris

Prior to the Conference, the 15th meeting of the International Committee of Legal Metrology convened. Some of the key issues were:

1. Problems of Electronic Devices.—With the exception of France and Poland who spoke in support of the need for a "general" secretariat within OIML, which would produce recommendations covering electronics, most other nations felt that the original position taken by the CIML in 1975 should be upheld. This position favored a decentralized handling of electronic problems by each Reporting Secretariat without having OIML undertake to prepare International Recommendations on general questions relating to electronics associated with measuring instrumentation. The United States upheld the position advised by the ACILM and the matter was tabled by the President for future consideration.

2. Acceptance of Work Plans for Pilot Secretariat 5, "Measurement of Liquid Volumes," and of Pilot Secretariat 17, "Measurement of Pollution."—The Work Plan for Pilot Secretariat 5, "Measurement of Liquid Volumes," drew a great deal of discussion from delegates. Prior to the opening meeting of the CIML the U.S. Delegation met with delegates from France and the Federal Republic of Germany to attempt to work out a solution to the problem of which nation(s) would assume responsibility for the Pilot Secretariatship of P. S. 5. No resolution of the problem could be found (with respect to one nation as Pilot Secretariat), and it was agreed among the three nations that the Pilot Secretariat should be administered by all three. A resolution

was drafted setting forth the principles under which the Secretariat would be administered.

3. Resignation of Responsibility for Secretariat on Grain Moisture Testing by the Federal Republic of Germany.—Prior to discussion of this topic during the CIML Meeting, the U.S. Delegation spoke to the French to determine their interest in administering this particular secretariat. The interest shown by the French was strong and in order not to pose procedural difficulties, as experienced in the Pilot Secretariat 5 controversy over more than one candidate for a secretariat, the United States withdrew its candidacy as secretariat in support of the French and expressed an interest in working closely with France in this important undertaking. The CIML concurred.

4. Proposed Creation of New Secretariats.—The allocation of the Secretariats is listed below:

a. P.S. 5/R.S. 23 (Liquefied Natural Gas Measurement) to be administered by the United States. The proposed secretariat will be administered by a joint NBS/API Technical Advisory Group composed of Doug Mann (NBS, Boulder) and Lee Hillburn (Phillips Petroleum, Oklahoma).

b. P.S. 9/R.S. 8 (Continuous Density Meters for Liquids and Gas) to be administered by a Technical Advisor to be nominated by the Scientific Apparatus Makers Association.

c. P.S. 19/R.S. 5 (Strain Gage Measurement) to be administered by the United States. The proposed secretariat will be administered by a U.S. Working Group headed by Mr. James Dorsey of Micro-Measurement, Inc.

d. P.S. 7/R.S. 8 (Load Cells) to be administered by the United States. The proposed secretariat will be administered by a Technical Advisor to be nominated from the Scale Manufacturers Association. The initial proposal on this secretariat was that it be placed under P.S. 19 dealing with the "Measurement of the Characteristics of Materials." However, the feeling of the Advisory Committee was that the majority of application of load cells is in weighing devices; therefore, the Reporting Secretariat should be placed under P.S. 7, "Measure of Masses," with the understanding that both mass and force would be covered by the work. The Committee recommended that the U.S. Delegation pursue such a position during the CIML Meeting.

5. In accordance with authorization received from the Department of State, the U.S. Delegation issued a provisional invitation to hold the Sixth International Conference of Legal Metrology in Washington in the summer of 1980. No other invitations were issued and the President accepted the U.S. offer, stating that he understood that it was subject to confirmation.

The U.S. Delegation concluded that at this stage in the development of OIML, an effective U.S. presence in OIML is needed for the following reasons:

a. To follow the technical and political developments in legal metrology throughout the world;

b. To defend U.S. industry and technology against the construction of technical barriers to trade; and

c. To protect the public interest of the people and the Government of the United States.

Mr. Jim Lyles briefly summarized his report to the Conference during the open hearing. He also offered comments on his experience over the past several years as the NCWM representative to OIML. We know that all members of the NCWM join the committee in expressing its deep appreciation to Jim for his valuable service to the Conference and weights and measures nationally in this regard.

NCWM REPRESENTATIVES TO OIML

The term of Mr. Jim Lyles as NCWM representative to OIML expires in March 1978. It is, therefore, necessary to name a new representative during the Conference this year. The Federal Advisory Committee Act limits the existence of an advisory committee to two years. An advisory committee is renewable upon request. As a result, membership in an advisory committee is limited to a two-year renewable term. Naming a new representative at the 62nd NCWM will permit the State Department sufficient time to conduct a security check which is the normal procedure when international organizations are involved. This will also give the new representative an opportunity to become familiar with his OIML responsibilities and to work on matters with Mr. Lyles for a few months.

The P & C Committee has considered this matter and a change to the Conference Organization and Procedures regarding the office of chairperson of the P & C Committee and offers the following recommendations to the Executive Committee for discussion and action this year.

1. Starting this year, the newly elected chairperson of the NCWM shall have the responsibility and be designated to serve as Conference representative to OIML for a two-year period. As required by the State Department, the term of appointment will commence in March 1978 and run to March 1980.

This will mean that only the chairpersons who are elected every other year (odd calendar year) will have this added responsibility. The committee is of the opinion that the two-year term is advisable since it will give the representative time to adequately understand and deal with issues in OIML. Having the NCWM chairpersons represent the Conference in official OIML matters is also viewed as a wise move as it will tie together the power of the Conference chairperson with the authority of the NCWM representative to OIML to act on behalf of the Conference. The fact that the second year of the OIML term will be served by the past chairpersons of the NCWM should present no problem.

2. The committee has considered another change involving the office of chairperson of the NCWM which it feels would provide cer-

tain improvements in the operation of the Conference and savings in Conference expenses. This change would have the reigning Conference chairperson serve as the fifth member of the P & C Committee.

At the present time, the membership of the Committee on National Measurement Policy and Coordination is comprised of the committee chairpersons of the other four standing committees and a fifth member who is appointed annually by the Conference president from a list of former Conference chairpersons who are still active in weights and measures regulatory service. This fifth member also serves as the chairperson of the P & C Committee.

The committee feels that one person can effectively manage all three responsibilities; that is, Conference chairperson, OIML representative, and P & C Committee chairperson. Savings can be realized by having the Conference chairperson attend the interim meetings rather than several persons as has been the case in the past several years.

NAME CHANGE

At the 61st NCWM, the Committee on Liaison with the Federal Government included in its final report a recommendation that its name be changed to the Committee on Liaison. This change would reflect areas of interest that extend beyond interaction with the Federal Government.

The Conference adopted this proposal, and the P & C Committee now recommends it be included in the report of the Executive Committee for final adoption this year.

(The sections covering policy, metric, the task force on national type approval program, the OIML report, the NCWM representative to OIML, and the name change for the Liaison Committee were grouped together for a vote. The sections were adopted by majority vote.)

SUPREME COURT DECISION

As a result of the March 1977 Supreme Court decision relating to weights and measures, there has been some concern regarding ramifications of this decision on weights and measures enforcement programs. In an attempt to provide uniform measurement policy, the P & C Committee distributed for discussion during its open hearing, "A Proposal for Interim Guidelines on the Supreme Court Decision." The guidelines were an attempt to respond to the decision until the issue of net weight could be resolved among Federal, State, and local enforcement agencies.

During the voting session, there was considerable opposition to establishing an NCWM position indicating a permissible quantity shortage due to moisture loss when the Supreme Court decision pre-empted State authority under the Federal laws and regulations. The membership also opposed the establishment of a single percentage for moisture loss of meats packaged under Federal inspection without having technical data to support the proposed allowance. There was also opposition to recommending a moisture determination on flour without having additional technical information available on flour when it was packaged.

As a result of these discussions, an amendment was made to the original guidelines to delete the paragraphs referring to a moisture loss allowance and a moisture determination. The guidelines take the following form with the proposed amendment. All paragraphs which were amended have the words underlined and the portions which were deleted or modified by amendments are shown lined out:

Interim Guidelines Based on the Supreme Court Decision

On March 29, 1977, the Supreme Court of the United States delivered its opinion on the case, *Jones, Director, Department of Weights and Measures, Riverside County* vs *Rath Packing Company et al.*

The Summary and Analysis appearing in the United States *Law Week*, Vol. 45, No. 38 stated:

> "In a decision that could have widespread effect on State authority to regulate food labeling, the U.S. Supreme Court rules that federal net weight labeling requirements preempt the application of California's refusal to allow for reasonable weight variations resulting from loss of moisture during distribution proves fatal; under federal law, such variations are allowed. . . .
>
> The federal Wholesome Meat Act provides standards of accuracy in labeling, and expressly prohibits the imposition of State labeling requirements that are 'different than' those provided by it. The Supreme Court unanimously finds that California's requirement that the label accurately state the net weight of the packaged bacon, without any allowance for moisture loss during distribution, is 'different than,' and thus preempted by the federal requirement.
>
> The federal laws governing the labeling of flour—the federal Food, Drug, and Cosmetic Act and the Fair Packaging and Labeling Act—do not expressly prohibit State regulation unless the State requirements are less stringent than or require information different from the federal requirements. Since the California requirements do not fall within either of these exceptions, they are not expressly preempted by the Federal laws. Nevertheless, a 7-2 majority of the Court holds that the California labeling requirements for flour, which do not permit reasonable weight variations

from loss of moisture during distribution, impermissibly conflict with the purpose of the federal Fair Packaging and Labeling Act. Thus, the State law must yield to the federal.

Justices Rehnquist and Stewart disagree 'with the implicit preemption the Court finds with respect to the flour,' but agree that the Wholesome Meat Act expressly preempts the application of California's requirements to packaged bacon."

Weights and measures enforcement must be in accordance with the decision of the "highest court in the land." Officials of the National Conference on Weights and Measures (NCWM) asked the Office of Weights and Measures (OWM) to collect information to assist the Committee on National Measurement Policy and Coordination (P & C Committee) in the development of a National Conference position in conformance with the decision. As part of the process of providing that assistance, State weights and measures officials were asked to discuss the decision as it relates to weights and measures enforcement with their Attorneys General and to forward all comments so that an analysis of the comments and a draft of an NCWM position paper could be prepared.

A summary of the comments submitted by 16 States and one county giving their opinions concerning weights and measures enforcement was distributed to State weights and measures officials on May 27, 1977. After the summary was prepared, additional written comments were received and many weights and measures officials discussed their views by telephone. Every effort was made by the committee to consider all views in its deliberation.

The information derived from these comments is submitted to the NCWM by the P & C Committee for its consideration. The first issue which had to be addressed was whether State and local officials should discontinue checking at retail commodities subject to moisture loss and packaged under Federal inspection. As to bacon and flour, some weights and measures officials suggested that full responsibility should be given to those Federal agencies involved. Most, however, felt that States must emphasize their authority for continuing enforcement. The committee encourages the Conference to endorse such continuance. With continuing enforcement comes the necessary conclusion that an allowance must be applied to the average of the lot for packages subject to moisture loss when checked at retail. (Weights and measures officials overwhelmingly agree that commodities which are not subject to moisture loss, products in moisture-proof or hermetically sealed packages, and products packed at retail are not affected by the decision.)

The second issue was to which products subject to moisture loss should allowance be applied and what numerical values should be assigned. Some weights and measures officials felt that numerical

values should initially be assigned only to bacon and flour since these were the only ones specifically mentioned in the court's decision. They argued that different numerical values for products other than bacon and flour could be established later on a product by product basis.

To other officials it appeared that the Supreme Court decision is not limited only to bacon but applies to all meat products under the jurisdiction of the Wholesome Meat Act (WMA). The committee agrees with this view because the decision was based on the WMA only, rather than on any particular characteristics of bacon which distinguish it from other meat products. Consequently, as a result of the decision, some moisture loss allowance must be provided for all products covered under the WMA and subject to moisture loss.

A third view expressed was that all appropriate products under WMA, Food Drug & Cosmetic Act (FDCA), and Fair Packaging & Labeling Act (FPLA) should have allowances for moisture loss. The committee does not agree since the arguments used to arrive at the Supreme Court decision on flour were unique to flour, in that federal standards of maximum moisture content exist which define the minimum amount of flour solids to be in packages labeled as flour. Other commodities under FPLA and FDCA do not have such clearly defined minimum solid requirements in the federal standards; therefore, the Supreme Court arguments do not apply. The committee therefore feels that only flour under the FDCA and FPLA is to be construed as having been affected by the Supreme Court decision.

~~In keeping with the emphasis placed by the Supreme Court on the provision in the law that variations from stated quantity of contents shall not be unreasonably large, the committee recommends that the States should recognize a moisture loss allowance of 0.5% for all packaged meat products subject to moisture loss except those packages inspected at packing establishments. This decision will not only provide an allowance for moisture loss during the course of good distribution practices for the packagers of meat products but will also limit the maximum amount of moisture loss that the consumer will have to absorb.~~

~~Because a federal standard requiring a specific maximum moisture content of 15% exists for flour, the committee recommends that, before any enforcement action is taken, a moisture determination on flour should be carried out in order to ascertain whether a full measure of flour solids was packed initially.~~

The first two issues were concerned with resolving the immediate question of what enforcement officials should do now. The last issue concerns a number of long term alternatives proposed in State com-

ments as the most effective course of action to obtain a permanent solution acceptable to the States.

Among the alternatives considered were:

1. Revise the model regulations;
2. Encourage Congress to pass new legislation;
3. Seek new litigation;

4. Prepare a NCWM resolution addressed to the appropriate Federal agencies requesting them to either require full net weight at retail based on the average weight of a statistically valid sample (so as to allow for reasonable variations in good manufacturing processes), or to publish figures for moisture-loss allowances for specific meat products. The committee agrees with the intent to require full net weight at retail but suggests that a petition from individual State and local jurisdictions, regional and State weights and measures associations, and consumer organizations to USDA, FDA, and FTC requesting appropriate amendments to their regulations would be more effective.

In summation, it may be stated that (1) commodities not subject to moisture loss, or packed in moisture-proof (hermetically sealed) packages, or commodities packed or the net weight determined at retail are not affected by the decision and no moisture allowance need be applied; (2) the decision applies to all meat products under the WMA and subject to moisture loss; and (3) the decision based on the FDCA and FPLA applies only to flour.

Therefore, the following guidelines ~~are~~ is recommended to the NCWM for its consideration:

~~1.~~ The NCWM should reaffirm its position that the States continue package compliance testing and enforcement.

~~2. For those products under the WMA and subject to moisture loss, an allowance of 0.5% of the labeled net contents should be applied to the average net contents of the lot as found and tested at retail.~~

~~3. Before enforcement action is taken, the moisure content of the flour packages should be determined to ascertain whether a full measure of flour solids had been initially put into the package.~~

Although the committee has offered ~~these~~ this guidelines to furnish needed interim direction to member jurisdictions for complying with the Supreme Court decision, it is further recommended that the NCWM adopt the following policy statement:

"It is the policy of the National Conference on Weights and Measures that measurement equity in the United States demands the continuation of an applied system of weights and measures regulation which assures accurate net weight at the time of retail sale."

(This item, as amended, was adopted by majority vote.)

S. D. Andrews, *Chairperson*
W. E. Czaia, Chairperson, S & T Committee
W. B. Harper, Chairperson, Education Committee
E. H. Stadolnik, Chairperson, Liaison Committee
C. H. Vincent, Chairperson, L & R Committee
J. F. Lyles, Representative, OIML
H. F. Wollin, *Exec. Secy.*, NCWM

Committee on National Measurement Policy and Coordination

(On motion of the committee chairperson, the report of the Committee on National Measurement Policy and Coordination was adopted in its entirety by the Conference by majority vote. The Conference also authorized the Executive Secretary to make any editorial changes in the language adopted by the Conference.)

REPORT OF THE COMMITTEE ON SPECIFICATIONS AND TOLERANCES

Presented by WARREN E. CZAIA, *Chairperson*,
Director, Division of Weights and Measures,
Department of Public Service, State of Minnesota

(Thursday, July 21, 1977)

The Committee on Specifications and Tolerances submits its final report to the 62nd National Conference on Weights and Measures. The report consists of the tentative report as presented in the Conference Announcement and as amended by its 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 open meeting of the committee. All recommended amendments are to appropriate provisions of the codes of the National Bureau of Standards Handbook 44, Fourth Edition, "Specifications, Tolerances, and Other Technical Requirements for Commercial Weighing and Measuring Devices."

NOTE: In order to provide a clear understanding of the recommended amendments, all paragraphs to be amended are printed in their present form; that which is to be deleted is shown lined out; and that which is to be added is underlined.

GENERAL CODE

1. G-S.5.6.1. Recorded Representations of SI Units on Equipment with Limited Character Sets.—See item 9 of the Code for Scales.

(The foregoing item was adopted by majority vote.)

CODE FOR SCALES

1. Electronic Cash Registers/Tare Capability.—The final report of the Southern Weights and Measures Association included an item, which was not adopted, recommending an amendment to the code requiring electronic cash registers, when interfaced with a weighing element for use at supermarket checkout stands, to be

equipped with a manual or automatic tare capability. It is the view of the committee that there already exists sufficient requirements to insure that these devices are so equipped.

The Model State Weights and Measures Law, Section 1.2., defines weight as follows. "The term 'weight' as used in connection with any commodity means net weight; except where the label declares that the product is sold by drained weight, the term means net drained weight."

Further, the Specifications and Tolerances Committee, in its final report, as adopted by the 58th National Conference on Weights and Measures, in addressing this problem expressed the interpretation that tare was mandatory, based on that net weight definition, and offered guidance to methods that could be used. The committee now reconfirms the position that tare capability must be inherent in the design of these systems to meet existing weights and measures requirements, and that amendment to the code is not necessary.

(The foregoing item was adopted by majority vote.)

2. ***SR.4.2. For Jewelers Scales***—A comment was received from the Northwest Weights and Measures Association stating that when the paragraphs on SR for Jewelers Scales were amended in 1975, ungraduated, or equal arm balances equipped with weights, with a capacity of more than ½ ounce, were not covered. To correct this oversight the committee recommends amendment to the code as follows:

SR.4.2. With a Capacity of More than One-Half Ounce.—The SR shall be the value of the minimum graduated interval of the device or 0.05% of the capacity of the scale, whichever is less.

(The foregoing item was adopted by majority vote.)

3. ***T.2.3.2. Minimum Tolerance Values/For Jewelers Scales With a Capacity of More than One-Half Ounce.***—The Northwest Weights and Measures Association recommended correction of an oversight in this paragraph similar to the previous item. The committee in recommending amendment to this paragraph is introducing new language consistent with terminology of the International Organization of Legal Metrology (OIML) and definitions added to the Scale Code last year. The committee recommends amendment to this paragraph as follows:

T.2.3.2. With a Capacity of More Than One-Half Ounce.—The minimum tolerance shall be one half the value of the ~~minimum increment~~ scale division or 0.05% of the nominal capacity of the scale, whichever is less.

(The foregoing item was adopted by majority vote.)

4. Zero-Load Tolerance—A suggestion was received from the Scale Manufacturers Association to amend the code in recognition of the recommendation in the test procedures published in HB-112 Examination Procedure Outlines, that a scale should not shift its zero-load indication by an amount greater than the minimum tolerance applicable. A similar item is being considered by the California Weights and Measures Association. The committee discussed this matter at great length and generally felt that there was a need for some recognition of a tolerance at zero under certain conditions. The committee is also aware that OIML International Recommendation #3 does specify a tolerance at zero on a decreasing load test equivalent to ½ scale division. However, the committee was not certain that there existed a problem and was concerned that the establishment of a tolerance at zero could result in problems in the field, especially when balance shifts which occur during the conduct of a test, can indicate the scale is in need of service. The committee also recognizes that it is unlikely that a scale will consistently return to a zero balance condition after a removal of a test load, and that wind and weather effects, such as rain or snow, does make it difficult for the official to determine the amount of balance shift brought about by the condition of the device itself. At the present time, the committee is not prepared to recommend amendment to the tolerance section of the code, but does recommend the addition of a note paragraph as follows:

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.)

(The foregoing item was adopted by majority vote.)

5. Wheel-Load Weighers.—The committee received a recommendation that the value of the scale division on wheel-load weighers, as required by paragraph U.R.1.1.8., be increased to 50 lb. After a lengthy discussion concerning the design and use of wheel-load weighers, and a review of the recommendations made to the committee over the last 5 years, it is the view of the committee that (a) the magnitude of the value of the scale division should be a function of the scale capacity; (b) these devices should be equipped with at least 400 scale divisions and; (c) the tolerances should be reduced. Therefore, the committee recommends amendment to the code as follows:

(Add the following two paragraphs.)

UR.1.1.9. For Wheel-Load Weighers.—The value of the scale

division shall be not greater than 0.25% of nominal capacity of the scale and in any case not greater than 50 pounds.

T.2.1.1. For Wheel-Load Weighers.—The minimum tolerance shall be 0.125% of the nominal capacity of the device or one-half the value of the scale division, whichever is less.

(Amend T.3.7. as follows.)

T.3.7. For Wheel-Load Weighers.—The basic maintenance tolerance for individual wheel-load weighers shall be ~~3 percent~~ 2 percent of the known test load. The basic acceptance tolerance shall be ~~2 percent~~ 1 percent of the known test load. When two wheel-loaders are marked and tested as a pair, the tolerance shall be applied to the sum of the indications of the two weighers, and the pair shall be approved or rejected upon the basis of the combined indications.

(The foregoing item was adopted by majority vote.)

6. UR.2.6.1. Approaches to Vehicle Scales.—The committee received communications from several organizations, including the Southern Weights and Measures Association and the Scale Manufacturers Association, recommending amendment to this paragraph. The suggestions received were:

(a) in the specified 10 feet of concrete approach, recognize as appropriate the grating used to receive grain or other granular material into a recessed pit;

(b) recognize bituminous material as adequate material for approaches;

(c) a slightly inclined approach be allowed for drainage purposes and;

(d) that directional signs be required to be posted when scales are installed so that traffic may flow in one direction only.

It is the view of the committee that (a) grating in an approach is certainly acceptable if it is so constructed that test weights can be moved across it; (b) bituminous material is adequate providing it is maintained in such a manner that the approaches are smooth and level; (c) a slope in the approach for drainage is proper; and (d) it is not necessary to amend the code to provide for directional signs, since any jurisdiction experiencing problems may so require. The committee recommends amendment to this paragraph as follows:

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) at least the width of the platform, and

(b) 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.

(The foregoing item was adopted by majority vote.)

7. Deviation of Indicated Values on Test Loads Applied to Individual Sections on Vehicle, Livestock, and Railroad Track Scales.—On the basis of a comment received last year, the committee discussed the need for a requirement which would limit the amount of deviation of the indicated values on test loads applied to individual sections of these scales. The primary concern is directed to scales with a two way traffic pattern, that is the weighing of the loaded vehicle in one direction and the unloaded vehicle in the opposite direction. This situation could result in a 0.4% error in the net weight, if the device were in error, plus 0.2% on one end and minus 0.2% on the other end. However, on single directional scales, errors in opposite directions between sections tend to counter balance one another and bring weighing results closer to zero error. Any adjustment to either of these sections to bring about less deviation in the test load errors could result in greater weighing errors.

The committee also considered paragraph G-UR.4.1. Maintenance of Equipment, as an enforcement tool for the official to require less deviation between sections on bi-directional devices. Paragraph G-UR.4.1. states in part that, "Equipment in service . . . found to be in error predominately in a direction favorable to the device user and near the tolerance limits shall not be considered 'maintained in a proper operating condition.' " However, the committee feels that there is a sound basis for limiting the deviation between sections and recommends amendment to the code by adding the following paragraph.

T.1.8. To Sectional Tests on Vehicle Livestock, and Railroad Track Scales.—The maximum deviation between indicated values on test loads applied to individual sections shall not be greater than the absolute value of the maintenance tolerance applicable to that test load.

The committee advises the conference that this paragraph applies to test weight loads only and does not apply to comparison tests conducted with vehicles which span more than one section.

The committee recommends the addition of the following definition:

absolute value. The absolute value of a number is the magnitude of that number without considering the positive or negative sign.

(The foregoing item was adopted by majority vote.)

8. Value of the Scale Division for Unusually Large Vehicle Scales.—The committee received a communication requesting amendment to several paragraphs of Handbook 44 since, by interpretation of this jurisdiction, paragraph UR.1.1.6. requires the value of the scale division to be not greater than 20 pounds on a 500,000 pound capacity vehicle scale. This resulted in a lengthy discussion on the entire section UR.1. Selection Requirements, which specify scale interval values for certain scales and certain weighing applications. Items discussed included (a) the requirements of this section were written when scales had considerably smaller capacities; (b) the difference between "precision" and "accuracy"; (c) the requirements of OIML International Recommendation #3, and the philosophy expressed in that document in which weighing precision is a function of the number of scale divisions rather than the value of the scale division; (d) the value of the scale division required in other weighing applications and; (e) the ratio of the quantity being weighed to the value of the scale division in certain weighing applications.

It is the view of the committee that specifying the value of the scale division without considering the scale capacity and the magnitude of loads to be weighed is inappropriate, and the philosophy expressed in the OIML International Recommendation is more sound.

It was determined that if it is deemed appropriate to use a 25 pound capacity scale to weigh two pounds of shrimp at $10.00 per pound, to the closest 0.01 pound [in this instance the number of scale divisions is 2500 and the ratio of the load (2 lb) to the value of the scale division (0.01 lb) is 200:1]; that it is equally appro-

priate to weigh a 200,000 lb load on a 500,000 lb capacity scale to the nearest 100 lb. In this instance the number of scale divisions is 5000 and the ratio of the load (200,000 lb) to the value of the scale division (100 lb.) is 2000:1. Thus, the precision provided is 10 times better when weighing sand and gravel, etc., on the larger scale, than when weighing shrimp at retail. Another example considered was the weighing of 7500 lb of hogs (30 hogs averaging 250 lb) to the closest 5 lb, which provides a ratio between load and the value of the scale division of 1500:1.

Therefore, the committee wishes to recommend that the scale industry and weights and measures officials discourage the sale and use of scales equipped with more than 6000 divisions for most commercial applications.

In response to the recommendations received suggesting those several amendments, the committee recommends no amendment to the code.

However, the committee directs the attention of the conference to the definition of vehicle scales, which is: one adapted to weighing highway vehicles, loaded or unloaded." Therefore, since highway load limits generally restrict loads in excess of 84,000 pounds, vehicles weighing in excess of that amount should be considered something other than a highway vehicle, and specifically an off-highway vehicle; and the scales on which they are weighed should not be considered vehicle scales. This being the case, the UR. paragraph which would apply would be UR.1.1.8., which requires the value of the scale division to be not greater than 0.1% of the nominal capacity of the scale, and in any case not greater than 50 pounds. Consequently, a scale used to weigh off-highway vehicles with a capacity of 500,000 pounds, would be required to have a scale division not greater than 50 pounds. The number of scale divisions in this instance would then be 10,000; (the maximum number of scale divisions to be considered appropriate in almost any usual commercial transaction).

(The foregoing item was adopted by majority vote.)

9. SI Symbols in Recorded Representations on Systems With Limited Printing Capabilities.—The committee was requested for an interpretation of the requirements of NBS Handbook 44 with respect to the SI symbols used to define quantity values on recorded representations provided by recording elements on weighing and measuring system. The problem concerns equipment with limited printing capabilities, that is, with either upper or lower case characters only. If a recording element, interfaced with a weighing system, is equipped with upper case characters only, it will print the symbol for kilogram as "KG". It is the committee's view that

to require a lower case character capability solely to provide the appropriate symbol lower case "kg" would be cost prohibitive, and further that there is no problem in identifying "KG" as kilograms just as there is no problem in identifying the abbreviation for pound as "LB" or "lb". The committee reviewed International Standard ISO 2955, which sets forth guidelines for the representation of SI and other units for use in systems with limited character sets. Based on that standard, the committee recommends amendment to the code as follows:

G.S.5.6.1. Recorded Representation of SI Units on Equipment with Limited Character Sets.—The appropriate defining symbols are shown in Table 1.

TABLE 1. *Representations of Units*

Name of Unit	International symbol (common use symbol)	Representation		
		Form I	Form II	
		(double case)	(single case lower)	(single case upper)
Base SI units				
metre	m	m	m	M
kilogram	kg	kg	kg	KG
Supplementary SI units				
newton	N	N	n	N
pascal	Pa	Pa	pa	PA
watt	W	W	w	W
volt	V	V	v	V
Other units				
litre	*l*	L	l	L
gram	g	g	g	G
tonne	t	t	tne	TNE
bar	bar	bar	bar	BAR
degree Celsius	°C	°C	°c	°C

(The foregoing item was adopted by majority vote.)

10. United States Grain Standards Act of 1976.—The committee reviewed the United States Grain Standards Act of 1976, which assigns responsibilities to the U.S. Department of Agriculture, that impact on State and local weights and measures enforcement activities. Section 4 of the act states in part as follows:

"(a) The Administrator is authorized to investigate the handling, weighing, grading, and transportation of grain and to fix and establish (1) standards of

kind, class, quality, and condition for corn, wheat, rye, oats, barley, flaxseed, grain sorghum, soybeans, mixed grain, and such other grains as in his judgment the usage of the trade may warrant and permit, and (2) standards for accurate weighing and weight certification procedures and controls, including safeguards over equipment calibration and maintenance, for grain shipped in interstate or foreign commerce; and the Administrator is authorized to amend or revoke such standards whenever the necessities of the trade may require.

(b) Before establishing, amending, or revoking any standards under this Act, the Administrator shall publish notice of the proposal and give interested persons opportunity to submit data, views, and arguments thereon and, upon request, an opportunity to present data, views, and arguments orally in an informal manner. No standards established or amendments or revocations of standards under this Act shall become effective less than one calendar year after promulgation thereof, unless in the judgment of the Administrator, the public health, interest, or safety require that they become effective sooner."

Section 7B of this act states as follows:

"(a) The Administrator shall provide for the testing of all equipment used in the sampling, grading, inspection, and weighing of grain located at all grain elevators, warehouses, or other storage or handling facilities at which official inspection or weighing services are provided under this Act, to be made on a random and periodic basis, but at least annually and under such regulations as the Administrator may prescribe, as he deems necessary to assure the accuracy and integrity of such equipment.

(b) The Administrator is authorized to cause such testing provided for in subsection (a) to be performed (1) by personnel employed by the Service, or (2) by States, political subdivisions thereof, or persons under the supervision of the Administrator, under such regulations as the Administrator may prescribe.

(c) Notwithstanding any other provision of law, no person shall use any such equipment not approved by the Administrator."

The committee has written to the Secretary of Agriculture offering the aid of the National Conference on Weights and Measures and State and local officials in the enforcement of this act and reminding the Secretary of the vast resources for the development of standards and testing programs in the National Conference on Weights and Measures.

(The foregoing item was adopted by majority vote.)

11. Scale Manufacturers Association (SMA) Recommendations.—The SMA, as a supplement to the recommendations "Design and Installation of Pit-Type Scales for Weighing Highway Vehicles and Their Axle Loads," adopted by the 57th NCWM in 1972, submitted to the committee a recommendation for "Installation and Performance Standards of Self-Contained Scales for Weighing Highway and Off-Highway Vehicles and Their Axle

Loads." It is the view of the committee that this is a useful document, and recommends it for endorsement by the 62nd NCWM.

Copies have been made available at the NCWM and can be obtained from OWM or SMA on request.

(The foregoing item was adopted by majority vote.)

12. Association of American Railroads (A.A.R.)—American Railway Engineering Association (A.R.E.A.)—Coupled in Motion (CIM) Weighing Study.—At the interim meeting, Mr. John J. Robinson (A.A.R.) and Mr. N. A. Wilson (A.R.E.A.) presented to the committee the results of a study conducted by A.R.E.A. Committee Scales—Subcommittee No. 3 in cooperation with the A.A.R. and NBS. This study included performance data on CIM track scales in an as found condition and recommendations for further activity. There is insufficient valid data presently available to recommend any change to the CIM tolerances in H-44.

The committee expresses its gratitude to all those participating and recommends the study be continued.

Copies of this study are available on request.

(The foregoing item was adopted by majority vote.)

CODE FOR BELT-CONVEYOR SCALES

1. A recommendation was received to reduce the tolerances applicable to belt-conveyor scales from 0.5% to 0.25%. This recommendation by a State jurisdiction was based on test data they had accumulated in the field over the past several years. It was also stated that from their experience most belt-conveyor scales when installed, used, and maintained properly could meet the recommended tolerance. It is the view of the committee, that additional data is necessary before a recommendation for a code amendment can be made. The committee requests all interested parties to submit data to the committee for their evaluation so that a positive recommendation can be made by the S&T Committee of the 63rd NCWM.

(The foregoing item was adopted by majority vote.)

CODE FOR LIQUID MEASURING DEVICES

1. Future Designs.—Included in the final report of the S&T Committee of the 61st National Conference on Weights and Measures

was a lengthy discussion expressing the views of the committee with respect to future designs of retail petroleum dispensers. The principal issues discussed were the problems which would arise, with existing devices and with the design of future devices, when the price of gas exceeded $1.00 per gallon. In that report, the committee expressed the view that neither consumers or users would find it acceptable when the total price displayed was not in mathematical agreement with the value obtained when multiplying the quantity delivered by the unit price. Paragraph G-S.5.5. now requires that agreement, which when translated into the design of digital indicating petroleum dispensers, would require the quantity to be displayed in 0.001 gallon units when the unit price exceeds $1.00 per gallon.

At the time this item was discussed on the floor of the 61st NCWM, several representatives of industry expressed the view that designing equipment to meet these recommendations of the S&T Committee may not meet the needs of the users of that equipment. They requested that this item be held open for discussion prior to and during the next NCWM. Since no amendment to the code was recommended by the S&T Committee in this report, the item was adopted by the 61st NCWM.

In response, the Gasoline Pump Manufacturers Association's technical committee and others offered comments to the S&T Committee of the 62nd NCWM during its interim meetings. A retail seller of gasoline commented that displaying quantities of gasoline in 0.01 gallon presently confused customers and that displaying in .001 gallon units would be worse. The committee is convinced that this is a correct assumption. However, they feel that the customer confusion has been brought about primarily because of the change from a totally standardized analog display to different digital designs. Further, that the customer will soon become accustomed to the new displays and would be more confused if the total price displayed is $20.01 for a 10 gallon purchase at $2.00/gallon. This is particularly true when one considers present customer complaints received concerning their purchase of 10 gallons of gas at $.699/gallon and the analog dispenser displays a total price of $7.00. This is, of course, brought about by the operator when he "rounds off" the sale by pumping in another 1¢ worth of gas so that he can write up a sale of $7.00 rather than $6.99.

The equipment manufacturers offered a suggestion for an amendment to G-S.5.5. as follows:

> G-S.5.5. Money Values, Mathematical Agreement.—Any recorded money value and any digital money-value indication on a computer-type weighing or measuring device used in retail trade shall be in mathematical agreement with its associated quantity repre-

sentation or indication ~~to the nearest one cent of money value~~ within one percent of the unit price indicated, but never less than one cent of money value. This does not apply to auxiliary digital indications intended for the operator's use only when these indications are obtained from existing analog customer indications which meet this requirement.

This means that if the unit price of gas is $1.00, the total price could display an apparent error of 1¢ ($1.00 × 1% = 1¢). At $3.00 per gallon this error could be 3¢ ($3.00 × 1% = 3¢).

In this instance a pump could indicate the following:

Gallons	10.00
Price per gallon	$ 3.00
Total Sale	$30.03

A comment was made at the interim meeting that before the price of gas exceeds $1.00 per gallon the industry would itself solve all these problems and go metric.

This is, and always has been, the recommended solution by the S & T Committee to the industry.

However, since there is no guarantee that this will happen, and that future designs will include a $9.99 unit price (price per gallon) capability, this design could bring about an indicated total price apparent error of 10¢ ($9.99 × 1% = 10¢). It is the view of the committee that this condition will be unacceptable to consumers, and that the philosophy expressed in G-S.5.5., in its present form, is sound.

Therefore, at this time, the committee recommends no code amendment.

(The foregoing item was adopted by majority vote.)

2. ***Intake Milk Meters Installed at a Creamery.***—The committee discussed amendment to the code to provide requirements for milk meters used as intake devices installed at the creamery. It is the committee's view that it would be inappropriate to amend this code and that a tentative code be developed. The recommended tentative code is as follows:

1977
TENTATIVE CODE
MILK METERS

(This Tentative Code has only a trial or experimental status and is not intended to be rigidly enforced. The requirements are designed for observation and study prior to the development and final adoption of a Code for Milk Meters.)

A. APPLICATION

A.1.—This code applies to devices used for the measurement of milk, generally applicable to, but not limited to, meters used in dairies, milk processing plants and cheese factories, to measure incoming bulk milk.

A.2.—See also General Code requirements.

S. SPECIFICATIONS

S.1. Design of Indicating and Recording Elements and of Recorded Representations.

S.1.1. Primary Elements.

S.1.1.1. General.—A meter shall be equipped with a primary indicating element and may also be equipped with a primary recording element.

S.1.1.2. Units.—A meter shall indicate and record if the meter is equipped to record, its measurements in terms of gallons. Fractional parts of these units shall be in terms of decimal or binary subdivisions.

S.1.1.3. Value of Smallest Unit.—The value of the smallest unit of indicated volume and recorded volume if the meter is equipped to record, shall not exceed 0.1 gallon or 1 pint.

S.1.1.4. Advancement of Indicating and Recording Elements.—Primary indicating and recording elements shall be susceptible of advancement only by the mechanical operation of the meter. However, a meter may be cleared by advancing its elements to zero, but only if

(a) the advancing movement, once started, cannot be stopped until zero is reached, or

(b) in the case of indicating elements only, such elements are automatically obscured until the elements reach the correct zero position.

S.1.1.5. Return to Zero.—Primary indicating elements and primary recording elements if the device is equipped to record, shall be readily returnable to a definite zero indication. Means shall be provided to prevent the return of the primary indicating elements and the primary recording elements if the device is so equipped, beyond their correct zero position.

S.1.1.6. Indication of Measurement.—A meter shall be constructed to show automatically its initial zero condition and the volume measured up to the nominal capacity of the device.

S.1.2. Graduations.

S.1.2.1. Length.—Graduations shall be so varied in length that they may be conveniently read.

S.1.2.2. 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 not be 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.1.2.3. Clear Interval Between Graduations.—The clear interval shall be not less than 0.04 inch. 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.1.3. Indicators.

S.1.3.1. 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.1.3.2. 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 graduations, shall be not more than 0.04 inch.

S.1.3.3. **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, and

(b) the width of the minimum clear interval between 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.1.3.4. **Clearance.**—The clearance between the index of an indicator and the graduations shall in no case be more than 0.06 inch.

S.1.3.5. **Parallax.**—Parallax effects shall be reduced to the practicable minimum.

S.1.3.6. **Travel of Indicator.**—If the most sensitive element of the primary indicating element utilizes an indicator and graduations, the relative movement of these parts corresponding to the smallest indicated value shall be not less than 0.20 inch.

S.1.4. **Computing-Type Devices.**

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, the price per unit at which the device is set to compute.

S.1.4.2. **Printed Ticket.**—Any printed ticket issued by a device of the computing type on which there is printed the total computed price shall have printed clearly thereon also the total volume of the delivery in terms of units and the appropriate fraction of the unit and the price per unit.

S.1.4.3. **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.

S.1.4.4. Money Values—Mathematical Agreement.—Any digital money-value indication and any recorded money value on a computing-type device shall be in mathematical agreement with its associated quantity indication or representation to within one cent of money value.

S.2. Design of Measuring Elements.

S.2.1. Vapor Elimination.—A metering system shall be equipped with an effective vapor eliminator or other effective means automatic in operation to prevent the passage of vapor and air through the meter. Vent lines from the air (or vapor) eliminator shall be made of metal tubing or some other suitably rigid material.

S.2.2. Maintaining Flooded Condition.—The vent on the vapor eliminator shall be positioned or installed in such a manner that the vapor eliminator cannot easily be emptied between uses.

S.2.3. Provision for Sealing.—Adequate provision shall be made for applying security seals to the adjustment mechanism and the register.

S.2.4. Directional Flow Valves.—Valves intended to prevent reversal of flow shall be automatic in operation.

S.3. Design of Intake Lines.

S.3.1. Diversion of Liquid To Be Measured.—No means shall be provided by which any liquid can be diverted from the supply tank to the receiving tank without being measured by the device.

S.3.2. Intake Hose.—The intake hose shall be

(a) of the dry-hose type,

(b) adequately reinforced,

(c) not more than 20 feet in length unless it can be demonstrated that a longer hose is essential to permit transfer from a supply tank,

(d) sufficiently clear so product in the hose is visible, and

(e) connected to the pump at horizontal or above to permit complete drainage of the hose.

S.4. **Marking Requirements.**

S.4.1. **Limitation of Use.**—If a meter is intended to measure accurately only liquids having particular properties, or to measure accurately only under specific installation or operating conditions, or to measure accurately only when used in conjunction with specific accessory equipment, these limitations shall be clearly and permanently stated on the meter.

S.4.2. **Discharge Rates.**—A meter shall be marked to show its designed maximum and minimum discharge rates. However, such minimum discharge rate shall not exceed 20 percent of such maximum discharge rate.

S.4.3. **Measuring Components.**—All components that affect the measurement of milk which are disassembled for cleaning purposes shall be clearly and permanently identified with a common serial number.

S.4.4. **Flood Volume.**—When applicable, the volume of product (to the nearest minimum division of the meter) necessary to flood the system when dry shall be clearly, conspicuously, and permanently marked on the air indicator.

N. NOTES

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.

N.2. **Evaporation and Volume Change.**—Care shall be exercised to reduce to a minimum, evaporation losses and volume changes resulting from changes in temperature of the test liquid.

N.2.1. **Temperature Correction.**—Corrections shall be made for any changes in volume resulting from the differences in liquid temperatures between time of passage through the meter and time of volumetric determination in the test measure. When adjustments are necessary, appropriate tables should be used.

N.3. **Test Drafts.**—Test drafts should be equal to at least the amount delivered by the device in one minute at its maximum discharge rate, and shall in no case be less than 100 gallons.

N.4. Testing Procedures.

N.4.1. Normal Tests.—The "normal" test of a meter shall be made at the maximum discharge rate that may be anticipated under the conditions of the installation. The "normal" test shall include a determination of the effectiveness of the air elimination system.

N.4.2. Special Tests.—"Special" tests to develop the operating characteristics of a meter and any special elements and accessories attached to or associated with the meter, shall be made as circumstances require. Any test except as set forth in N.4.1. shall be considered a special test.

N.4.3. System Capacity.—The test of a milk-metering system shall include the verification of the volume of product necessary to flood the system as marked on the air eliminator.

T. TOLERANCES

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.

T.2. Tolerance Values.—Maintenance and acceptance tolerances shall be as shown in table 1.

TABLE 1. *Tolerances for Milk Meters*

Indication	Maintenance tolerance	Acceptance tolerance
Gallons	*Gallons*	*Gallons*
100	0.5	0.3
200	0.7	0.4
300	0.9	0.5
400	1.1	0.6
500	1.3	0.7
Over 500	Add 0.002 gallons per indicated gallon	Add 0.001 gallons per indicated gallon

UR. USER REQUIREMENTS

UR.1. Installation Requirements.

UR.1.1. Plumb and Level Condition.—A device installed in a fixed location shall be installed plumb and level, and the in-

stallation shall be sufficiently strong and rigid to maintain this condition.

UR.1.2. Discharge Rate.—A meter shall be so installed that the actual maximum discharge rate will not exceed the rated maximum discharge rate. If necessary, means for flow regulation shall be incorporated into the installation, in which case this shall be fully effective and automatic in operation.

UR.1.3. Unit Price.—There shall be displayed on the face of a device of the computing type the unit price at which the device is set to compute.

UR.1.4. Intake Hose.—The intake hose shall be so installed as to permit complete drainage and that all available product is measured following each transfer.

UR.2. Use requirements.

UR.2.1. Return of Indicating and Recording Elements to Zero.—The primary indicating elements (visual), and the primary recording elements when these are returnable to zero, shall be returned to zero before each transfer.

UR.2.2. Printed Ticket.—Any printed ticket issued by a device of the computing type on which there is printed the total computed price, the total volume, or the price per gallon, shall have shown thereon also the other two values (either printed or in clear script).

UR.2.3. Ticket in Printing Device.—A ticket shall not be inserted into a device equipped with a ticket printer until immediately before a transfer is begun. If the meter is mounted on a vehicle, in no case shall a ticket be in the device when the vehicle is in motion while on a public street, highway, or thoroughfare.

UR.2.4. Credit for Flood Volume.—The volume of product necessary to flood the system as marked on the air eliminator shall be individually recorded on the ticket of each transfer affected.

(The foregoing item was adopted by majority vote.)

3. EPA Stage II Vapor Recovery Regulations and Test Procedures.—Since the interim meetings a situation has arisen with respect to the Environmental Protection Agency (EPA) implementation of Stage II vapor recovery regulations and test procedures. Reports from California indicate that a significant number

of customers can be shorted with the installation of certain vapor recovery systems. Therefore, a solution to this problem is necessary. The Office of Weights and Measures visited the State of California and offers the following report of that investigation.

STAGE II VAPOR RECOVERY

The Environmental Protection Agency (EPA) is forcing stage II vapor recovery upon service stations. Different technologies are being developed to meet this federal requirement. While vapor recovery is of primary importance, the weights and measures problems which have been caused and exaggerated by vapor recovery systems cannot be ignored.

The developing technology must include considerations designed to maintain not only the traditional measurement accuracy, but also delivery accuracy. Recycling of fuel must be kept to a minimum. While spitback and spillage has occurred before vapor recovery systems were used, it appears to have been increased by some of these systems. This results in additional fuel vapor emissions to the atmosphere and greater inaccuracy in a fuel delivery.

Technology is striving to cope with the vapor recovery problem. California weights and weasures officials have conducted numerous tests on these systems to determine their characteristics from the weights and measures viewpoint. Their tests have lead to proposed regulations appropriate for the current stage of development of vapor recovery systems. The intent of the regulations is to minimize delivery error while permitting technology to improve until the previous level of measurement accuracy can be maintained in a delivery.

The ultimate solution for weights and measures considerations appears to be installation of an automatic means which prevents the recycling of fuel from the vehicle tank. This device is important to restore consumer confidence in the vapor recovery system and provides assurance that recycling is not occurring.

One approach to this problem has been the development of a liquid check valve which automatically prevents liquid from entering the vapor return line. Unfortunately, after its occasional activation, this check valve ultimately drains fuel to the ground which consequently evaporates to the atmosphere. Although this system may need further development, it is possible that the valve could be an effective and reasonable solution to the weights and measures problem without interfering with the vapor recovery process.

Industry is encouraged to pursue this or any other technology which will automatically prevent any liquid from recycling through the vapor line. Until better technology has been developed, the

Test Results

Vapor Recovery System	Pressure at Nossle Inches W.C.	Total Vehicles	Total Gallons Dispensed	Vehicles With Measurable Return	Vehicles Exceeding 0.5 in³/gal Return	Ave. Return All Vehicles in³/gal	Ave. Return Vehicles With Return in³/gal	Spit-back	Average Delivery Gallons
Vacuum Assist A	–0.2 to –0.5	159	1348.8	6 trace	0	0	0	35 24%	8.5
Vacuum Assist B	–0.1 to –0.3	122	1493.5	9 7.4%	0	0.011 .005%	0.18	7 5.7%	12.2
Vacuum Assist C	–4.0	100	941	14 14%	1 1%	.017 .007%	.137	19 19%	9.4
Vacuum Assist C	–2.7	115	894.7	2 1.7%	1 0.9%	.007 .003%	.26	5 3.3%	7.8
Vacuum Assist D	–0.1	228	1742.9	39 17.1%	0	.014 .006%	.083	26 11.4%	7.6
Balance E		595	6558	30 5.0%	10 1.7%	.016 .0007%	.54	46 7.7%	11.0
Balance F		185	2104	12 6.5%	6 3.3%	.036 .016%	.56	13 7.0%	11.4
Balance G		100	828.8	1 1.0%	0	.003 .001%	.23	12 12%	8.3
Balance H		196	1628.8	13 6.6%	2 1.0%	.016 .007%	.25	14 7.1%	8.3
Balance H		64	807.1	14 22%	5* 8.0%	.333* .141%	1.06*	30* 47%	12.6
Balance H		87	1071.8	3 3.4%	0 0.0%	.003 .001%	.131	25 29%	12.3
Balance I		106	1034.9	15 14%	2 1.8%	.07 .03%	.39	28 26%	9.8

* One nozzle automatic shut-off was not working properly.

proposed California regulations are recommended for adoption by the Conference. These regulations will minimize weights and measures problems as installation of vapor recovery systems is initiated nationwide.

It should be noted that the test data collected by California verify the practicality and achievability of these requirements. A fuel trap was installed in the vapor return line for test purposes to enable measurement of any recycled fuel. The California data also indicates that the frequency of recycling a measurable quantity of fuel should be regulated so as to be an infrequent occurrence.

These conditions can be achieved by requiring the average amount of fuel recycled for each gallon delivered to be below a specified level. "Unusual" overfills could be excluded from the test sample if it can be demonstrated that the overfill was, indeed, unusual and is not reproducible under normal operation.

The effectiveness of some vapor recovery systems to prevent recycling of fuel from the vehicle tank is dependent upon their design. In other cases a particular feature, such as a check valve mounted in the vapor return line, may prevent recycling. In either case any new system should be tested initially to determine its performance. If the system is determined to be appropriate and meets the performance criteria, it is not necessary to test individual installations provided they are installed in the same manner and with the same equipment as the original system. Periodic tests may be conducted on a system to verify that the performance is not deteriorating due to component malfunction or time. If a single component is responsible for preventing recirculation, only that component need be tested periodically.

Since conclusive information is not yet available upon which to base a permanent solution, the committee recommends the following tentative or trial recommendations for use by weights and measures jurisdictions when problems are encountered.

S.3.1.1. Vapor Recovery.—A motor-fuel device with a vapor recovery system shall be equipped with

(a) effective means automatic in operation to stop the liquid flow when the receiving vessel is full, and

(b) a check valve mounted at the nozzle or other effective means automatic in operation to prevent the passage of liquid through the vapor return line.

T.2.5. Vapor Recovery System Tests.—In a vapor recovery system test the quantity of measured product recycled during a delivery shall not exceed

(a) 0.2% of an individual delivery, and

(b) 0.02% of the total fuel delivered to the 200 or more vehicles fueled during the test period.

The committee wishes to express to the State of California its appreciation for the extensive study they conducted and recommends that all interested parties continue to provide information to the S & T Committee so that a permanent solution can be recommended for action by the 63rd National Conference on Weights and Measures.

The committee further advises the conference that a test procedure jointly developed by the State of California and the Office of Weights and Measures will be distributed to all State offices by September 1, 1977.

(The foregoing item was adopted by majority vote.)

CODE FOR FARM MILK TANKS

1. T.4. Basic Tolerance Values, Master Meter Method.—A comment was received recommending that the committee review this paragraph since it appears that this requirement will allow a careless calibration technique, and provide for tolerances larger than necessary. The committee studied, at length, the comments received by the S&T Committee of the 60th NCWM, and the discussions concerning the changes made in this code at that conference. It was the intent of the committee in recommending those amendments adopted by the 60th NCWM to provide the following: (1) the calibration of farm milk tanks with a meter; (2) the test of farm milk tanks with a meter; (3) to insure that when a master meter is used for calibration that the error in the standard does not exceed 25% of the smallest tolerance applicable to the device under test and; (4) to recognize the variation between meters used to calibrate or test farm milk tanks.

Consequently, if a meter is used to calibrate a farm milk tank, it must operate within 0.05% of the total amount of each draft, which is 25% of 0.2% tolerance specified in T.3. However, if the same official using the same meter were to test that farm milk tank he just calibrated, at varying intervals of 25 gallons, 75 gallons, 100 gallons, 500 gallons, the gage rod indications would not repeat the same precise values.

Therefore, it was necessary to provide for a basic tolerance on the test of a farm milk tank equal to twice the acceptance tolerance on the initial calibration. It must be considered that the initial calibration does not have a tolerance; for when a tank is calibrated, those are considered as true values. When a tank is tested the

tolerance applied is a recognition of a deviation from that which was considered to be true value.

Also considered in the development of these requirements, was the uncertainty of provers and the other variables in the entire process.

Consequently, it is the view of the committee that the existing code requirements are appropriate and do not, in fact, provide for less careless calibration.

(The foregoing item was adopted by majority vote.)

2. *Farm Milk Tank Gages.*—The S&T Committee of the 61st NCWM agreed to develop amendments for Handbook 44, directed to exterior gages and gage tubes used on farm milk tanks. Using as a reference the gage tube and gage requirements of NBS Handbook 105.3 entitled, "Specifications and Tolerances for Metal Volumetric Field Standards," the following criteria were considered as a base for the development of requirements to be included in this code. These specific requirements will be available for distribution at the 62nd NCWM. Prior to that time, the committee would appreciate receiving comments on these criteria.

The gage shall be sanitary in design and construction and shall be readily accessible for cleaning or shall be designed for mechanical cleaning.

The gage tube shall be borosilicate glass or approved rigid plastic or firmly supported flexible tubing and the internal diameter shall be uniform (about 1″ I.D.). It shall be designed and constructed so that all product in the gage will be discarded. This shall be accomplished in such a manner that no product in the gage will enter the discharge line or re-enter the tank.

If the tank is horizontal and pitched towards the discharge, the gage must be mounted to compensate for this angle. That is, the gage and gage tube must be vertical.

The scale plate shall be mounted adjacent to and parallel with the gage tube and be no more than ¼″ from the tube. The graduation lines shall be clear and easily readable.

The scale graduations shall comply with the requirements of the paragraphs included under S.3.5. Graduations.

The gage shall be equipped with a sliding assembly to assist in viewing the liquid level.

Because the measurement precision is not sufficient for small quantities the committee further recommends that the following User Requirement be added to the code.

UR.3. Use.—A determination of quantity shall not be made for a quantity less than 20% of the nominal capacity of the tank.

Discussion ensued on this item, resulting in a motion being made, seconded and passed, to amend this item by deleting the term "or firmly supported flexible tubing" and by deleting the last two paragraphs.

(The foregoing item as amended was adopted by majority vote.)

CODE FOR GRADUATES

1. S.7.1. Design of Graduations-General.—A manufacturer submitted to the committee a graduate on which the graduations were applied with a new technology, which was neither etched nor engraved. It is the committee's view that this new technology meets all of the functional characteristics implied by "etched or engraved," and in recognition of this new technology, and to provide a specification that is performance oriented; the committee recommends this paragraph be amended as follows:

S.7.1. Design of Graduations-General.—Graduations shall be perpendicular to the axis of the graduate and parallel to each other. Graduations shall be continuous, of uniform thickness not greater than 0.015 inch (0.4 mm) clearly visible, permanent, and indelible under normal conditions of use.

NOTE: This terminology is consistent with OIML International Recommendation #4—Volumetric Flasks.

(The foregoing item was adopted by majority vote.)

CODE FOR FABRIC MEASURING DEVICES

1. S.1. Units.—A comment was received that this paragraph, which lists units in common fractions, i.e., ⅛, ¼ etc., seemed to preclude the use of decimal fractions. It is the committee's view that decimal fractions are appropriate, and recommends amending this paragraph to read:

S.1. Units.—A fabric-measuring device shall indicate lengths in terms of ⅛ yards, ¼ yards, ½ yards, and yards. In addition, lengths may be indicated in terms of any or all of the following sub-divisions: ⅓ yards, 1/16 yards, feet and inches. Digital indicators may indicate values in demical fractions.

(The foregoing item was adopted by majority vote.)

1. S.1. Design of Indicating Elements.—Comment was received from a manufacturer that digital odometers will be available on cars in the near future, and digital odometers could not meet the requirements of paragraph S.1.4. Advancement of Indicating Elements and S.1.5. Readability. It is the view of the committee that digital odometers are certainly appropriate and recommends amendment to the code as follows:

S.1.4. Advancement of Indicating Elements.—The most sensitive indicating elements of an odometer ~~shall~~ may advance continuously or intermittently; all other elements shall advance intermittently. Except when the indications are being returned to zero, the indications of an installed odometer shall be susceptible of advancement only by the rotation of the vehicle wheel or wheels.

S.1.5. Readability.—~~Mileage~~ Distance figures and their background shall be of sharply contrasting colors. Figures indicating tenth units shall be differentiated from other figures with different colors or with a decimal point or by other equally effective means. Except during the period of advance of any decade to the next higher indication, only one figure in each decade shall be exposed to view. Any protective covering intended to be transparent shall be in such condition that it can be made transparent by ordinary cleaning of its exposured surface.

(The foregoing item was adopted by majority vote.)

2. Trip Odometers.—The committee considered a communication received which indicated that a problem existed for consumers in determining the amount of miles driven when hiring a vehicle, with the driver furnished, and paying on a mileage basis. The only reference available is the cumulative odometer which requires the customer to record the beginning and ending mileage and calculate the difference to determine the actual miles traveled. The recommended solution was to amend the code to require a returnable to zero trip odometer. The committee feels it has sufficient information, as to the extent of this problem, and at the present time recommends no code amendment.

(The foregoing item was adopted by majority vote.)

3. UR.1. Inflation of Vehicle Tires.—Comments were received concerning the pressure maintained in the tires on the vehicle in use

and the tire pressure during a test. The committee agrees with the view expressed by a State jurisdiction that it is the responsibility of the owner or leasor of the vehicles to determine the appropriate tire pressure to be maintained in the tires on the vehicle in use, and that the first test of an odometer on a vehicle should be in an "as found" condition. The committee recommends amendment to the code as follows.

Delete present paragraphs N.1.3.2. (a) and (b) and insert the following:

N.1.3.2. Tire Pressure.—At the completion of the test run or runs, the tires of the vehicle under test shall be checked to determine that the tire pressure is that operating tire pressure posted in the vehicle. If not, the tire pressure should be adjusted to the posted tire pressure and further tests may be conducted to determine the operating characteristics of the odometer.

UR.1. Inflation of Vehicle Tires.—The ~~cold~~ operational tire pressure of passenger vehicles and truck tires shall be ~~maintained at not less than the cold tire pressure recommended by the manufacturer of the vehicle~~ posted in the vehicle, and shall be maintained at the posted pressure.

The philosophy expressed here is the same as the User Requirements of the Code for Scales, which place the burden of the responsibility on the owner or user for maintaining scales in a level and correct zero balance condition. It is also consistent with the philosophy that devices should be tested by an official in an "as found" condition, to determine the operating characteristics of the device under test as used in commercial service.

(The foregoing item was adopted by majority vote.)

4. Application.—It is the view of the committee that the requirements of this code are applicable to all odometers, regardless of the size of the vehicle in which they are mounted; however, no reference to this fact is made in the item that follows and in the new recommended code. If no justifiable data to the contrary is submitted to the committee prior to the issuance of its final report to the 62nd NCWM, this final report will include that recommendation.

(The foregoing item was adopted by majority vote.)

5. Metric and OIML.—The Office of Weights and Measures reviewed this code for compatibility with an OIML draft International Recommendation, entitled "The Metrological and Technical Re-

quirements for Mechanical or Electro-mechanical Speedometers, Distance Measuring Devices, and Tachygraphs on Automobile Vehicles"; and to identify metric constraints, and a draft proposed code was prepared. The elimination of metric constraints was accomplished primarily by substituting the word "distance" for "mileage."

Copies of the proposed code, with the recommended changes for compatibility with OIML and metric devices, have been circulated to the 50 State offices.

This is the first attempt to provide for metric conversion and to fulfill our moral obligation as a member of OIML. It is the view of the committee that this is a worthwhile effort and recommends adoption of this proposed code.

NOTE: This proposed code includes the amendments recommended in items 1 and 3 of this part of the report.

ODOMETERS

A. APPLICATION

A.1.—This code applies to odometers that are used or are to be used to determine the charges for rent or hire of passenger vehicles and trucks and buses rated by the manufacturer at 20,000 pounds, or 10 metric tons, gross vehicle weight or less. (When official examinations are undertaken on odometers that form the basis for the payment of fees or taxes to, or the preparation of reports for, governmental agencies, and in similar cases, the requirements of this code shall be applied insofar as they are applicable and appropriate to the conditions of such special uses.)

A.2.—This code does not apply to odometers on trucks having a gross vehicle weight rating in excess of 20,000 pounds, or 10 metric tons, or to taximeters (for which see Code for Taximeters).

A.3.—See also General Code requirements.

NOTE: Conversions
20 000 lb = 9072 kg
22 046 lb = 10 000 kg

S. SPECIFICATIONS

S.1. Design of Indicating Elements.

S.1.1. General.—The primary indicating element of an odometer may be:

(a) The distance-traveled portion of the "speedometer" assembly of a motor vehicle,

(b) a special cable-driven distance-indicating device, or

(c) a hub odometer attached to the hub of a wheel on a motor vehicle.

S.1.2. Units.—An odometer shall indicate in terms of miles or kilometers.

S.1.3. Value of Minimum Indication.—The value of the minimum interval of mileage on an odometer shall be one-tenth mile or, for metric odometers, one-tenth kilometer.

S.1.4. Advancement of Indicating Elements.—The most sensitive indicating element of an odometer ~~shall~~ may advance continuously or intermittently; all other elements shall advance intermittently. Except when the indications are being returned to zero, the indications of an installed odometer shall be susceptible of advancement only by the rotation of the vehicle wheel or wheels.

S.1.5. Readability.—~~Mileage~~ Distance, figures and their background shall be of sharply contrasting colors. Figures indicating tenth units shall be differentiated from other figures with different colors or with a decimal point or by other equally effective means. Except during the period of advance of any decade to the next higher decade, only one figure in each decade shall be exposed to view. Any protective covering intended to be transparent shall be in such condition that it can be made transparent by ordinary cleaning of its exposed surface.

N. NOTES

N.1. Testing Procedures.

N.1.1. Test Methods.—To determine compliance with distance tolerances, a distance test of an odometer shall be conducted utilizing one or more of the following test methods:

(a) Road Test.—A road test consists of driving the vehicle over a precisely measured road course.

(b) Fifth-Wheel Test.—A fifth-wheel test consists of driving the vehicle over any reasonable road course and determining the distance actually traveled through the use of a mechanism known as a "fifth wheel" that is attached to the vehicle and that independently measures and indicates the distance.

(c) Simulated-Road Test.—A simulated-road test consists of determining the distance traveled by use of a roller de-

vice, or by computation from rolling circumference and wheel-turn data.

N.1.2. Test Runs.—Not less than two test runs shall be conducted. Acceleration and deceleration shall be carefully controlled to avoid spinning or skidding the wheels.

N.1.2.1. For Devices Indicating in Miles.—The test runs shall be two miles in length, shall start from, and finish at, a dead stop with a minimum of 80 percent of the run between 30 miles per hour and 45 miles per hour.

N.1.2.2. For Devices Indicating in Kilometers.—The test runs shall be three kilometers in length, shall start from, and finish at, a dead stop with a minimum of 80 percent of the run between 50 kilometers per hour and 70 kilometers per hour.

N.1.3. Test Conditions

N.1.3.1. Tire Stabilization.—Road tests or fifth-wheel tests shall be preceded by a run of at least 5 miles, or 8 kilometers, for the purpose of stabilizing tire pressure. Simulated road tests on a roller device shall be made at stable tire pressure.

NOTE: Conversions

2 mi = 3.2 km	45 mph = 72.4 km/h
1.6 mi = 3 km	46.6 mph = 75 km/h
5 mi = 8.04 km	31.1 mph = 50 km/h
4.97 mi = 8 km	
(mi for mile)	

N.1.3.2. Tire Pressure.—At the completion of the first test run or runs, the tires of the vhicle under test shall be checked to determine that the tire pressure is that operating tire pressure posted in the vehicle. If not, the tire pressure should be adjusted to the posted tire pressure and further tests may be conducted to determine the operating characteristics of the odometer.

N.1.3.3. Vehicle Lading.

(a) Passenger Load.—During the distance test of an odometer, the vehicle may carry two persons.

NOTE: OIML draft specifies driver only.

(b) Truck Cargo Load.—Truck odometers shall be tested when the truck is loaded with one-half of the maximum cargo load.

T. TOLERANCES

T.1. To Underregistration and to Overregistration.—The tolerances hereinafter prescribed shall be applied to errors of underregistration and errors of overregistration.

T.2. Tolerance Values.—Maintenance and acceptance tolerances on odometers shall be 4% of the interval under test.
NOTE: OIML draft specifies 4%.

UR. USER REQUIREMENTS

UR.1. Inflation of Vehicle Tires.—The operational tire pressure of passenger vehicles and truck tires shall be posted in the vehicle, and shall be maintained at the posted pressure.

NOTE: Conversions
4 psi = 27.6 kPa
4.3 psi = 30 kPa
150 lb = 68.0 kg
154 lb = 70 kg

DEFINITIONS OF TERMS

The terms defined here have a special and technical meaning when used in the Odometer Code.

cold tire pressure. The pressure in a tire when the tire is at ambient temperature.

fifth-wheel test. A distance test similar to a road test except that the distance traveled by the vehicle under test is determined by a mechanism known as a "fifth wheel" that is attached to the vehicle and that independently measures and indicates the distance.

maximum cargo load. The maximum cargo load for trucks is the difference between the manufacturer's rated gross vehicle weight and the actual weight of the vehcile having no cargo load.

odometer. A device that automatically indicates the total distance traveled by a vehicle. For the purpose of this code, this definition includes hub odometers, cable-driven odometers, and the distance-indicating, or odometer, portions of "speedometer" assemblies for automotive vehicles.

operating tire pressure. The pressure in a tire when the vehicle has been driven for at least 5 miles or 8 kilometers.

passenger vehicles. Vehicles such as automobiles, recreational vehicles, limousines, ambulances, and hearses.

road test. A distance test, over a measured course, of an odometer assembly when installed on a vehicle, the mechanism being actuated as a result of vehicle travel.

rolling circumference. The rolling circumference is the straight line distance traveled per revolution of the wheel (or wheels) that actuates the odometer. In the case where more than one wheel actuates the odometer, the rolling circumference is the average distance traveled per revolution of the wheels.

simulated-road test. A distance test during which the odometer may be actuated by some means other than road travel. The distance traveled is either measured by a properly calibrated roller device or computed from rolling circumference and wheel-turn data.

(The foregoing item was adopted by majority vote.)

CODE FOR TAXIMETERS

1. Metric and OIML.—The Office of Weights and Measures also reviewed the Taximeter Code for compatibility with OIML International Recommendation #21, entitled "Taximeters"; and to identify metric constraints.

Copies of this code, with the recommended changes for compatibility with OIML and metric devices, have been circulated to the 50 State offices and will be available at the NCWM.

(The foregoing item was adopted by majority vote.)

CODE FOR TIMING DEVICES

1. S.1.1.6. Discontinuous Indicating Parking Meters.—The committee received several comments on this requirement which was added in 1975 and amended in 1976. The committee reconfirms its position set forth in its Final Report of the 61st NCWM and recommends this paragraph be amended to read as follows:

S.1.1.6. Discontinuous Indicating Parking Meters.—For parking meters with a capacity of 2 hours or less, an indication of the time purchased shall be provided for a minimum of one minute for times less than one hour and a minimum of two minutes for

times of one hour or more at the time the meter is activated. For parking meters with a capacity of more than two hours, convenient means shall be provided to indicate to the purchaser the unexpired time.

(After considerable discussion and debate, the recommendation of the foregoing item was defeated by majority vote.)

2. *UR.2. Inoperative Devices.*—The final report of the Southern W&M Assn. included this item, in which it was stated that customers were not satisfied when operators merely posted a sign with a name and address. So that itinerant or new customers may seek immediate relief without the necessity of writing a letter, the committee recommends the following amendment.

UR.2. Inoperative Devices.—Fully informative instructions for the return of money for service not received shall be prominently displayed at all installations. This information shall include the name, address and phone number of the local servicing agency for the device.

Discussion ensued on this item, resulting in a motion being made, seconded and passed, to amend this item by deleting paragraph UR.2. Inoperative Devices. Renumber the present paragraph UR.3. to UR.2. Amend G-UR.3.4. Responsibility—Money-Operated Devices by adding the following sentence at the end of the paragraph.

This information shall include the name, address, and phone number of the local servicing agency for the device.

(The foregoing item as amended was adopted by majority vote.)

OTHER ITEMS

1. *International Organization of Legal Metrology (OIML).*—During the interim meeting, the committee discussed at length the impact of OIML on the NCWM. It is clearly evident to the committee that U.S. participation in OIML will be mutually beneficial, and that the OIML International Recommendations (IRs), and other documents, will prove to be a valuable resource in the development of H-44 M. This is obvious, of course, since all other OIML member countries are "metric"; and all of the International Documents are applicable to metric equipment. The influence of OIML is indicated throughout this report.

The committee also discussed a methodology for NCWM active participation in the work of OIML. This work includes the devel-

opment of draft documents, commenting on draft documents and on recommended amendments to IRs, and can include the recommendation of amendments to IRs.

Since the organization and procedures of the NCWM sets forth the scope of the S&T Committee, ". . . embraces all matters dealing with (a) specifications, tolerances, and technical requirements of any kind, relating to commercial scales, weights, measures, and weighing and measuring devices and accessories, including interpretation of such material whenever necessary, (b) standards and testing equipment for weights and measures officials, and (c) procedures for testing commercial equipment"; the committee will act as the focal point for all OIML work following within that scope. The committee will review all OIML documents and will circulate those documents to the State weights and measures offices and other NCWM participants expressing an interest. Thus, it will provide the opportunity for comment from each State and other interested parties. After receiving these comments, the committee will transmit to the NCWM representative of the U.S. Advisory Committee and to the NBS Office of International Standards, (which has the responsibility for administering U.S. participation in OIML), the NCWM consensus.

Also, since the United States has been assigned the responsibility for administering P.S. 7, Measures of Masses, the S&T Committee will serve on the U.S. Committee for that secretariat.

The document outlining the working methods of OIML secretariats has been circulated to each State office and is available from the Office of Weights and Measures on request.

The present status of OIML work of interest to the weighing and measuring community is as indicated in the following table.

Copies of this status report and the referenced documents are also available from the Office of Weights and Measures on request.

2. ***Pressure Measurement.***—Pressure Measurement has been of interest to weights and measures officials over the years. Accurate pressure measurement plays an important role in the calibration of odometers, quantity measurements and maintenance of safe pressures for compressed gases, and for pressure corrections in tests of liquid propane meters. Other measurements include blood pressure, tire pressure, and the setting of altimeters at general aviation airports. All pressure measurements with legal implications should be traceable to the national standards at NBS. For critical applications new and short calibration chains should be established.

Some of the areas mentioned are of concern to weights and measures officials. It may be desirable to develop a capability in State weights and measures laboratories to measure pressure with moderate but well documented accuracy with an economical, simple,

International Organization of Legal Metrology (OIML)
International Recommendations and Proposed Draft Recommendations of
Interest to the Weights and Measures Community

Pilot/ Reporting Secretariat	Secretariat Country	Title of Document	IR #	Year Published	Status
		GENERAL LEGAL METROLOGY			
PS 1	Poland	International Vocabulary and Addenda (1st and 2nd)	# not yet assigned	1969	Adopted
PS2/RS1	BIML	Law on Legal Metrology	I.D. #1	1976	Adopted
PS2/RS4	India	Metal Stamps for Verification Agents	# not yet assigned	1975	Adopted
PS2/RS4	BIML	Placement of Verification Marks on Measures and Measuring Instruments	—	1974	3rd Draft
		LENGTH MEASUREMENT			
PS4/RS2	Belgium and Hungary	Materialized Measures of Length for General Use	# not yet assigned	1974	Adopted
PS4/RS3	France	Length Measuring Instruments for Fabrics, Cables and Wires	—	1972	1st Draft
		LIQUID MEASUREMENT			
PS5/RS3	United Kingdom	One-Mark Pipettes	IR #4	1971	Adopted now undergoing revision
PS5/RS5	France	Bottles Used as Measured Containers	—	1971	1st Draft
PS5/RS6	Switzerland	Drinking Glasses	IR #29	1973	Adopted
PS5/RS9	France/Romania	Vehicle Tanks as Measure	—	1968	3rd Draft
PS5/RS13	France and W. Germany	Meters for Liquids Other than Water With Measuring Chambers (PD)	IR #5	1970	Adopted now undergoing revision
PS5/RS13	France and W. Germany	Meters for Liquids Other than Water—Complementary Devices	IR #27	1973	Adopted
PS5/RS13	France and W. Germany	Measuring Systems for Liquids Other Than Water-Equipped with Metering Devices	—	1975	1st Draft
PS5/RS15	United Kingdom	Water Meters	# not yet assigned	1975	Adopted

Pilot/ Reporting Secretariat	Secretariat Country	Title of Document	IR #	Year Published	Status
		GAS MEASUREMENT			
PS6/RS1	Netherlands	Gas Meters—General	IR #6	1970	Adopted/ Revised in 1976
PS6/RS1	Netherlands	Gas Meters with Deformable Walls	IR #31	1973	Adopted
PS6/RS2	W. Germany	Gas Meters with Rotary Pistons and Turbine Meters	IR #32	1973	Adopted
PS6/RS3	W. Germany	Orifice Meters	—	1973	4th Draft
PS6/RS4	Czechoslovakia	Measurement of Gaseous Hydrocarbons Distributed by Pipeline	—	1975	2nd Draft
		MASS MEASUREMENT			
PS7/RS4	France and W. Germany	Metrological Regulations for Non-Automatic Weighing Devices	IR #3	1970	Adopted/ Revised in 1976
PS7/RS4	France and W. Germany	Technical Regulations for Non-Automatic Weighing Devices	IR #28	1973	Adopted
PS7/RS5	United Kingdom	Weigh Feeders	—	1970	3rd Draft
PS7/RS5	United Kingdom	Continuous Totalizing Weighing Machines (Belt-Conveyor Scales)	—	1975	5th Draft
		WEIGHTS			
PS8/RS3	BIML	Conventional Value of the Results of Weighing in Air	IR #33	1973	Adopted
PS8/RS4	France and W. Germany	Standard Weights for the Control of Large Capacity Scales	# not yet assigned	1976	Adopted
PS8/RS5	Belgium and United Kingdom	Cylindrical Weights from 1 Gram to 10 Kilograms	IR #1	1973	Adopted
PS8/RS5	Belgium and United Kingdom	Parallelepipedic Weights from 5 to 50 Kilograms	IR #2	1973	Adopted
PS8/RS5	Belgium and United Kingdom	Class "0" Weights from 50 Grams to 20 Kilograms	—	1971	Pre-Draft
PS8/RS6	Belgium	Weights of Precision Classes E1-E2-F1-F2-M1 of 50 Kilograms to 1 Milligram	IR #20	1973	Adopted

Pilot/ Reporting Secretariat	Secretariat Country	Title of Document	IR #	Year Pub-lished	Status
		SPEED/DISTANCE MEASUREMENT			
PS10/RS1	Switzerland	Measure of Linear Speed by the Doppler Effect	—	1969	1st Draft
PS10/RS2	Poland	Metrological Regulations for Mechanical and Electromechanical Speedometer, Track Measuring Devices, Tachygraphs for Automotive Vehicles	—	1969	4th Draft
PS10/RS3	W. Germany	Taximeters	IR #21	1973	Adopted
		ELECTRICAL MEASUREMENT			
PS13/RS3	France and USSR	Electrical Energy Meters with Direct Connection	# not yet assigned	1975	Adopted
		WEIGHTS AND MEASURES EQUIPMENT			
PS24/RS1	India	Standard Weights for Verification Agents	IR #25	1973	Adopted
PS24/RS1	India	Standard Balances for Verification Agents	—	1974	1st Draft
PS24/RS2	India	Rigid Metre for Verification Agents	IR #24	1973	Adopted
PS24/RS2	India	Standard Graduated Pipettes for Verification Agents	# Not yet assigned	1974	Adopted
PS24/RS2	India	Standard Burettes for Verification Agents	# Not yet assigned	1974	Adopted
PS24/RS2	India	Standard Graduated Glass Vials for Verification Agents	# not yet assigned	1975	Adopted
PS24/RS2	India	Standard Capacity Measures from 2 dm^3 to 20 dm^3 for Verification Agents	—	1974	1st Draft
PS24/RS2	India	Standard Capacity Measures from 50 dm^3 to 2000 dm^3 for Verification Agents	—	1975	1st Draft
PS24/RS2	India	Verification Agents Standard Graduated Measuring Cylinders	—	1974	1st Draft
PS24/RS2	India	Steel Tape Measures for Verification Agents	—	1974	1st Draft
PS24/RS2	India	Standard Proving Measures for Verification Agents (nominal capacity higher than 2000 dm^3)	—	1974	1st Draft
PS24/RS2	India	Standard Capacity Measures (Metal) for Verification Agents: 20 mL—10 L	—	1969	1st Draft

(The foregoing item was adopted by majority vote.)

and expandable system. The NBS Pressure and Vacuum Section, headed by Dr. Peter Hydemann, has developed simple hardware for checking tire pressure gages and air towers at gas stations. They are also preparing a measurement assurance program to disseminate accurate pressure measurements into the field and assessing field laboratory capability at the same time.

Dr. Hydemann and his staff are genuinely interested in cooperating in the development of the field measurement programs. States which are interested in exploring and developing programs in pressure measurement should contact the Office of Weights and Measures to coordinate this activity with the Pressure and Vacuum Section.

(The foregoing item was adopted by majority vote.)

3. Postal Rate Computing Scales.—The Office of Weights and Measures informed the committee that there are presently digital designs of postal rate and parcel service computing scales with different methods of indication and operating characteristics. The Office of Weights and Measures offers the following comments and guidelines for present use and for study prior to offering specific code amendments to the S & T Committee of the 63rd National Conference on Weights and Measures.

Applicable Sections of H-44 to
Postal Rate Computing Scales
(Digital electronic, U.S. Customary units)

Scale Code	General Code
S.1.1.	G-A.1.
S.1.4.	G-A.3.
S.1.4.1.	G-S.1
S.1.6.3.	G-S.2
S.2.1.1.	G-S.3. Qualified
S.2.1.2.	G-S.4.
S.2.1.3.	G-S.5.1.
S.2.1.5.	G-S.4.2.3.
S.2.3.	G-S.5.2.4.
S.2.4.	G-S.5.2.5.
S.2.4.1. Qualified	G-S.5.3.
S.3.2.	G-S.5.4. Qualified to tolerance.
S.4.1.	G-S.5.5.
S.4.2.	G-S.6

S.6.1.(c)	G-S.7
S.6.2.	G-UR.1.1.
S.6.4.	

The evaluation of postal rate computing scales is not limited to these sections. These sections did apply to one or both of the first two scales of this design submitted for prototype examination. As new technology is used, additional sections of H-44 will apply.

Computing scales designed for determining rates for postal services are considered to have a special design (G-A.3.). The sections of the Scale and General Codes which are appropriate for this weighing application have been applied. The special design of these scales requires new considerations and tolerances. Sections of H-44 which have special interpretations for these scales or for which the Postal Service has specified designs are explained below. The ounce is used in this description since this is the base unit used by the U. S. Postal Service (USPS).

GENERAL CODE

G-S.1. If the identification badge is located on the back of the device and the scale is built in, the badge may not be visible after installation. If the device is heavy or difficult to move, the badge located on the back of the device is not suitable.

G-S.2. It is not necessary for a postal scale to indicate the zone used to establish the rate since the customer is presented with the weight and total price. This is sufficient to check the accuracy of the transaction by referring to a rate table.

G-S.5.1. (a) After discussion with U. S. Postal Service representatives, it was decided that for a scale to be appropriate in design for its intended purpose (determining postal rates) it should truncate the weight values. This design shall be consistant with the rate structure established by the U. S. Postal Service and as presented in their tables. The design of the weight indication requires it to be identified as a special application. Scale Code S.6.2. intends a scale designed for limited application be identified as such. It is appropriate to combine these identifications to comply with these sections. This can be accomplished by placing immediately above or below the weight indication the statement "For Rate Determinations Only". The U. S. Postal Service will not permit UPS rates on the scales they purchase.

(b) The scales should be designed so no price is indicated when there is no load on the load receiving element. Only under unusual technical problems will this be allowed and only on seldom used rates; i.e. International rates only (allowed to date).

(c) Zero must be defined to within ±0.03 oz ($\frac{1}{32}$ oz). This must be indicated by a light or a legend separate from the display if the device has automatic zero balance capability which has a range in excess of ±0.03 oz ($\frac{1}{32}$ oz) or if the range of the displayed "zero" exceeds ±0.03 oz. The automatic zero balance capability cannot exceed 0.03 oz in the positive direction.

(d) The scale should not give the next higher rate until the breakpoint is exceeded. This does not take scale error into consideration. This is a Postal Service requirement.

G-S.5.2.2. (c) Not applicable because the device application requires a better definition of quantity than $\pm 0.5d_d$.

G-S.5.5. Price indications must agree with the weight indications based on the design given in G-S.5.1.

SCALE CODE

S.1.1. Positive or negative signs should not be displayed with the zero balance indication. Due to the special weighing application it is not sufficient for the scale to define and indicate zero balance only within $\pm 0.5d_d$. The zero balance must be better. See G-S.5.1.

S.1.4. The scales submitted for prototype had a capacity of 70 lb with $d_d = 0.5$ oz and $n = 2240$. The scales differentiate weight values much more accurately but only display values to 0.5 oz. Since the required accuracy of the computed rates must be great, the zone of uncertainty of $0.3d_d$ is too large for this weighing application. To distinguish this special consideration from the normal requirements of S.1.4. the zone of uncertainty will be called the "threshold". Therefore, for postal rate scales, the threshold for any weight indication (not including zero) shall not exceed 0.03 oz. The scale error is not a consideration in this requirement. Zero is excluded since automatic zero maintenance may be $0.6d_d$ in the negative direction.

S.1.6.3. This section is applicable when both parties are present at the time the rate is being determined. This establishes the rate determination as a direct sale and applies to the USPS (UPS and other rate determinations when both parties are present). This should be considered nonretroactive and applicable only to digital electronic computing scales. The USPS wants customer indications with these scales.

S.2.1.3. Since these scales are used to determine the rate for letters less than 0.5 oz, it is necessary that the amount of weight which can be "rezeroed" must be small. The USPS wants any weight in excess of 0.03 oz to indicate a rate, therefore, the maximum weight which can be "rezeroed" is 0.03 oz. In the negative direction this can be $0.6d_d$ but zero must be defined as given in G-S.5.1.

S.6.1. (c) Because the capacity by minimum division is not immediately apparent on a digital device, it must be conspicuously marked either above or below the display or in close proximity (also required by G-S.5.1.).

S.6.2. The philosophy of this section is to require specialized equipment to be identified as such. Since the weight indications are not permitted to "round off," the scale should not be used for normal weighing. Consequently, the device should be marked with the statement "For Rate Determination Only". (See G-S.5.1.).

TOLERANCE APPLICATION

Postal scales will be used to weigh letters and packages which will range in weight from less than 0.5 oz to 70 lb. The postal rate structure requires a one ounce first class letter to be mailed at the "one ounce or less" rate. The USPS requires the scale to give the lower rate until the breakpoint is exceeded (See G-S.5.1.). When a one ounce weight is placed on the load receiving element, the scale should always give the "one ounce or less" rate.

To be considered appropriate for determining postal rates from 0.5 oz to 70 lb, the maximum error to be allowed at 0.5 oz or 1 oz (the breakpoints for certain postal rates) should be 0.03 oz ($\frac{1}{32}$ oz). Therefore, the minimum acceptance and maintenance tolerance applicable is 0.03 oz. The tolerances in H-44 Scale Code Table 4 will apply to the test loads. No additional allowances shall be made to the tolerance although the scales are digital devices.

The tolerance at the low end is to be applied after the weight breakdown has been exceeded. This is necessary so letters are mailed at the proper rate. The scale should not indicate the next higher rate until the weight value has been exceeded but the transition to the next higher rate must begin within 0.03 oz ($\frac{1}{32}$ oz) after the weight breakpoint has been exceeded. That is, the scale must enter the threshold (zone of uncertainty for postal computing scales) in the $\frac{1}{32}$ oz tolerance and must complete the transition in $\frac{1}{32}$ oz from the point at which the transition began. After 1 lb has been exceeded, the tolerance can be applied to the nominal weight indication as a plus and minus tolerance.

The USPS is currently using table 3 as their acceptance and maintenance tolerances. The USPS wants all tolerances applied to the upper end of the breakpoint for the customers benefit.

(The foregoing item was adopted by majority vote.)

4. Petroleum Measurement.—The committee prior to its interim meeting, had received a request from the State of Hawaii, to con-

sider publishing in its tentative report a definition of a U. S. petroleum gallon.

It was the view of the committee that this was not necessary and consequently made no reference to this request in its tentative report.

However, since that time the committee feels that an expression of their view may be beneficial to the National Conference on Weights and Measures. Therefore, the committee presents the following comments.

The position of the committee with respect to what has been referred to as "the legal, technical, and factual definition of the true U. S. Petroleum Gallon" can be summarized as follows:

1. The "gallon" as a unit * of measurement is defined by the National Bureau of Standards in its Letter Circular LC1035 titled "Units and Systems of Weights and Measures—Their Origin, Development, and Present Status" amended January 1976, as follows:

1 gallon (gal) (U.S.)	231 cubic inches (exactly) 3.785 liters 0.833 British gallon 128 U.S. fluid ounces (exactly)

* A "unit" is a value, quantity, or magnitude in terms of which other values, quantities, or magnitudes are expressed. In general, a unit is fixed by definition and is independent of such physical conditions as temperature. Examples: The yard, the pound, the gallon, the meter, the liter, the gram.

* A "standard" is a physical embodiment of a unit. In general, it is not independent of physical conditions, and it is a true embodiment of the unit only under specified conditions. For example, a yard standard has a length of one yard when at some definite temperature and supported in a certain manner. If supported in a different manner, it might have to be at a different temperature in order to have a length of one yard.

2. The "standard" base for petroleum measurement in the United States is a 231 cubic inch gallon at 60 °F. This standard is generally applied in measurements within the petroleum industry and, to a limited extent, in commercial measurements at the retail level.

3. NBS Handbook 44, "Specifications, Tolerances, and Other Technical Requirements for Commercial Weighing and Measur-

ing Devices", provides for the application and use of both the "unit" gallon with respect to the design and performance of some measuring devices in commerce (such as the gas pump) and to a "standard" gallon with respect to other devices (such as LP gas liquid meters). State and local laws and regulations dictate whether a "unit" or "standard" gallon of measurement will be applicable to a particular measuring device or practice in the marketplace. Such laws and regulations are based upon the legal, technical, and economic considerations that are involved in the measurement process—with consumer cost/benefit a major factor.

4. Federal and State regulations that have been adopted under the Fair Packaging and Labeling Act dealing with the units of measurement for petroleum products stipulate: a declaration of quantity in units of liquid measure shall be in terms of the United States gallon of 231 cubic inches or liquid-quart, liquid-pint, or fluid-ounce subdivisions of the gallon, and shall express the volume at 68 °F (20 °C), except in the case of petroleum products, for which the declaration shall express the volume at 60 °F (15.6 °C). . . .

5. Any reference to a "true" U. S. Petroleum Gallon (the definition of which has been stated as 231 cubic inches at 60 °F) is confusing and has no official status. Use of the term "true petroleum gallon" is not recommended.

6. The committee assumes that this latest inquiry again relates to the interest of the State of Hawaii in having the National Conference on Weights and Measures take action which would require the retail sale of gasoline on a temperature compensated basis. The Conference Committee on Specifications and Tolerances under whose jurisdiction this subject falls does not find sufficient cause to bring the issue up for debate before the Conference this year. The committee believes most State and local weights and measures officials continue to view the problem of mandatory temperature compensation of gasoline and other petroleum products sold at retail as being cost prohibitive and with insufficient compensating benefits to consumers, government, or industry.

7. With the move toward metric conversion in the United States, the harmonization of U. S. metrological regulations and practices with those of foreign governments, the sophistication of electronic weighing and measuring technology, and the continuing search for "equity in the marketplace", it seems reasonable to assume that temperature compensation of petroleum products at all levels of commerce will be given very close scrutiny in the

years ahead. Temperature compensation will be incorporated throughout the United States as a uniform method of sale in all State and local jurisdictions as soon as the cost/benefit ratio justifies such action.

(The foregoing item was adopted by majority vote.)

The committee expresses its appreciation to all who have contributed to and participated in the committee deliberations. The committee urges all weights and measures officials and other affected parties to promptly communicate with the committee on all matters of concern. It is only in this manner that the committee can consider all problems and fully evaluate all situations prior to issuing its reports.

W. E. Czaia, *Chairperson*, Minnesota
J. R. Bird, New Jersey
G. L. Delano, Montana
M. L. Kinlaw, North Carolina
C. Wooten, Florida
O. K. Warnlof, *Staff Assistant*, NBS
H. F. Wollin, *Exec. Secy.*, NCWM

Committee on Specifications and Tolerances

(On motion of the committee chairperson, the report of the Committee on Specifications and Tolerances was adopted in its entirety by the Conference by majority vote. The Conference also authorized the Executive Secretary to make any appropriate editorial changes in the language adopted by the Conference, provided that the requirements thus adopted are strictly adhered to.)

REPORT OF THE COMMITTEE ON LAWS AND REGULATIONS

Presented by C. H. VINCENT, *Chairperson;*
Director, Department of Consumer Affairs, Dallas, Texas

(Thursday, July 21, 1977)

The Committee on Laws and Regulations submits its final report to the 62nd 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 open meeting of the committee.

METRIC CONVERSION OF MODEL REGULATIONS

With the passage of the Metric Conversion Act of 1975 (Public Law 94-168), it was recognized that the Committee on Laws and Regulations would become a primary mechanism to be relied upon to secure uniformity in metric packaging and labeling regulations. With additional resources available within the Office of Weights and Measures to coordinate metric conversion, the committee was able to present to the Conference for approval a fully revised Model State Packaging and Labeling Regulation, which had been widely circulated to obtain consensus preferences. Also, the committee plans to revise the Model State Unit Pricing Regulation and the Model State Method of Sale of Commodities Regulation.

The committee recommends for consideration and adoption the final draft of the "Model State Packaging and Labeling Regulation: Metric & Customary Units," prepared by OWM and distributed at the 62nd NCWM with full editorial privilege granted to the Executive Secretary.

After some discussion a motion was passed to require the "re" spelling of metre and litre in the revised version of the Packaging and Labeling Regulation if it is consistent with the Department of Commerce printing policy.

After further discussion a motion was made and seconded to table this item to allow additional consideration during the next year.

(The foregoing item was tabled by majority vote)

1. Declarations of Price on Random Packages

The State of New Mexico brought to the attention of the committee what appears to them to be a weakness in the wording of the Model State Weights and Measures Law with reference to declarations required on random packages. The wording, they feel, is intended to require unit pricing on random packages; however, because the section contains the clause "and bearing the total selling price of the package," the effect is to eliminate unit pricing if the total price is not displayed on the package. This is regrettable, they believe, since it is difficult for a consumer to select among random packages without price information directly available on the packages.

New Mexico suggested that NCWM take action to remedy this situation by amending the Model Law and bringing this anomaly to the attention of all jurisdictions. The proposed revision, modified by the committee, is as follows:

> **SECTION 14. DECLARATION OF PRICE ON RANDOM PACKAGES.**—In addition to the declarations required by Section 13 of this Act, any package being one of a lot containing predetermined random weights of the same commodity shall bear on the outside of the package at the time it is offered or exposed for sale at retail a plain and conspicuous declaration of the price per single unit of weight and the total selling price of the package.

The Industry Committee on Packaging and Labeling pointed out that this amendment might have an undesirable effect on produce "packages," where shelf labels are used to convey unit pricing information and the total selling price is often determined at checkout time. Additionally, the committee learned from a New Mexico official at the hearings that the practice of not displaying either the unit pricing or the total price on random packages had apparently been abandoned. (These packages "displayed" unit price in the Universal Product Code symbol for automatic scanning.) Because of corrective developments by the sellers, the committee does not support this recommendation for change.

(The foregoing item was passed by majority vote)

1. Multi-Unit, Variety and Combination Packages

The Laws and Regulations Committee has been plagued for several years by a multiplicity of letters and petitions combining questions and issues, and offering a variety of suggestions; all relating to mixed-package problems.

Attempts to apply the appropriate regulation (if it can be determined) to the solution of these packaging problems often result in frustration because the rules in many cases simply do not work. Indeed, many packagers caught up in this confusion seem to have some difficulty understanding why their transparent overwrapped box should be characterized as a package in the first place.

Two of the better ideas which the committee received include a suggestion to require State registration of such packages and another to eliminate the related model state regulations and adopt, wholesale, the Federal Trade Commission regulations. It does not seem clear that registration would get to the heart of this matter and, as the Industry Committee on Packaging and Labeling points out, there are quite a few differences between the Food and Drug Administration's regulations and Federal Trade Commission's regulations. In any case, where an imaginative gift packager decides to combine two varieties of foods, under FDA, with silverware, under FTC, and roller skates, which are under State jurisdiction; the committee cannot agree that total weight is a plausible solution.

It may not be possible to draft regulations to cover all possible mixed-package problems; however, the committee does feel that one set of rules should be distilled from the current chaotic situation and recommends that a task force be formed possibly under the jurisdiction of the NCWM Liaison Committee to explore the feasibility of establishing uniform Federal-State regulations as a logical first step.

(The foregoing item was adopted by majority vote.)

2. Container Type Commodities

A consumer relations counsel and a California weights and measures official petitioned the Committee on Laws and Regulations to respond to the need for a method of sale for certain container type commodities. The committee considered beverage type containers such as coffee makers and thermos bottles. The committee believes that these containers should be sold by expressed capacity. Several units were considered. They include the litre, the measuring cup, the serving cup and the serving portion.

The customary-system cup was generally accepted to equal 8 fluid ounces whether used as a measuring cup or as a serving cup. Gradually, however, the serving cup became smaller and at various times was fixed at 6 fl oz, 5 fl oz, 4½ fl oz, etc., with the 5 fl oz capacity currently considered somewhat more definitive than other values. The metric measuring cup of 250 millilitres (mL), the committee believes, would be an effective round unit for declaring the capacity of these commodities and would present no problem for consumers in making value comparisons as long as 250 mL is the only allowable value for the cup.

The metric serving portion, industry representatives indicate, could rapidly become an international standard for the sale of container type commodities. They recommend that the serving portion should be fixed at 150 mL and present the following assumptions upon which the recommendation is based.

1. Information given on the product, on labels, in ads, in use and care, in product names, etc., should be meaningful and helpful to the consumer.

2. Any new standards should be written in rounded metric with equivalent customary following. Example: 150 mL (5 fl oz).

3. Serving portion is more meaningful than "cup" when referring to coffee/tea brews.

4. Cup size standardization to reflect range of capacities of new mug/cup sizes and designs (6-15 fl oz) would be a monstrous undertaking involving the whole consumer, food, manufacturing, and food service industries. It is not necessary or recommended.

5. Products should be labeled and advertised based on number of portions of finished brew.

6. Capacity marks, if given, should be based on initial water rather than on expected yield because that is more helpful to the consumer.

There has been some disagreement as to whether the capacity of certain containers should be determined by the amount of liquid put in or the amount of product one can pour out. At this time the committee believes that the yield, expressed in variable serving portions, should be permitted as an optional declaration. The committee further supports a fixed measure of 250 mL for the metric cup.

The National Coffee Association, as representatives of manufacturers of roasted and instant coffees, are strongly opposed to the adoption of a national standard for cup volume or serving portion

as it might relate to appliance manufacturers, cup manufacturers, or otherwise. In particular, they believe the adoption of a standard such as the one under consideration, that is, one which regulates a "serving portion," whether construed as cup volume or actual coffee usage per cup, would be arbitrary, confusing to consumers and other industry groups, and, overall, counter-productive to its intended purpose of communicating information to the consumer that would be meaningful and helpful. Instead, they feel, the committee might give consideration to establishing a capacity standard for coffee brewing appliances expressed in terms of total volume of water poured into the unit or the volume of coffee beverage delivered from the unit after brewing. Such a standard, the National Coffee Association states, would be unambiguous to consumers and manufacturers alike and would avoid the confusion that is bound to result if brewing appliance capacities are arbitrarily related to coffee consumption habits and economics.

Nevertheless, the committee recommends for consideration and adoption an addition to **SECTION 10.8. Measurement of Container-Type Commodities, How Expressed.**, as follows:

10.8.3. Coffee Makers, Coolers, Etc.—Appliances and portable containers which temporarily store or dispense beverage or food shall specify capacity as follows:

(a) The expressed capacity for coffee makers shall be stated in terms of its holding capability in cups and fractions of cups of 250 mL capacity. The yield may be stated in terms of the number and size of serving portions. (Example: Holds 4 cups, each 250 mL; yields 5 serving portions, each 200 mL).

(b) The expressed capacity for thermos bottles shall be stated in terms of its holding capacity in cups and fractions of cups of 250 mL capacity. (Example: Holds 2.5 cups, each cup 250 mL)

(c) The expressed capacity for jugs and coolers shall be stated in terms of its holding capacity in litres and fractions of litres.

(d) Section 10.8.3. shall be effective on January 1, 1979, and shall apply to new products manufactured in round metric sizes and to products labeled in metric units.

After considerable discussion by all sides, a motion was made and seconded to table this item, since it was felt that it might more

properly be an item covered under the Department of Commerce's new Voluntary Consumer Product Information Labeling Program.

(The foregoing item was tabled by majority vote)

3. Textiles

The State of California and the American Textile Manufacturers Institute asked the NCWM Laws and Regulations Committee and the National Bureau of Standards to assist in the resolution of two textile-product issues. In the first issue California asks for help in correcting a short measure condition, apparently a nationwide problem, which has been found in the packaging and labeling of textile yard goods put up on bolts or rolls.

The problem is outlined as follows:

1. Approximate width measurements are being used by some manufacturers in their label declarations. For example, "58/60" inch width.
2. Label declarations are false and misleading in that actual amounts are less than the quantity represented on the label.
3. Section 10.9.3. of the Model State Packaging and Labeling Regulation is extremely vague as to its intent and true meaning. Are the substantial variations (3% and 6%) and (6% and 12%) permitted as product tolerances, or are they maximum unreasonable minus and plus errors errors to be allowed when sampling the product for quantity when using Handbook 67?

California favors the repeal or clarification of Section 10.9.3. and suggests amending Section 10.9.2. (k) to read:

> The quantity statement for packages of textile yard goods packaged in the bolt or roll for either wholesale or retil sales shall state its net measure in terms of yards for the length and width of the item, or its net weight in terms of avoirdupois pounds or ounces, or in terms of their metric equivalent.

During the interim meetings, a representative of the American Textile Manufacturers Institute (ATMI) informed committee members that the proposal to identify the width of yard goods with a single measurement (as opposed to a range) would be given serious consideration by their members, after which, a recommendation will be finalized and submitted to the Laws and Regulations Committee.

After the interim meetings the National Home Sewing Associa-

tion said that if a single width declaration is required, the following could result:

(a) No change in manufacturing process would be effectuated; only the size declaration on bolts would be changed.

(b) Short measure problem could be created because consumers would look for the fabric to be exactly the stated width and since the manufacturing processes were not changed, the width is in actuality the same as it was with the range declaration.

(c) Increased cost to manufacturers would result. One loom is used for many different fibers now; a single width declaration could create a need for many looms for each of the different fibers, thereby imposing "pass-a-long" costs to consumers.

(d) Consumer deception would be fostered, in that a single declaration implies actual measurement.

California officials state that roll or bolt fabric should be labeled accurately with a single declaration. Additionally, they believe that industry does have enough shrinkage data on fibers used in the manufacturing processes, and thus could provide accurate measurement declarations on finished fabrics or materials.

The committee believes that accurate quantity information should be provided on consumer products; however, no labeling changes should be required until patterns and yard goods are marketed in metric units. At that time all measures shall be singularly stated (eliminating dual numbers) and, until that time, any products where size declaration is a range and found to be less than the smaller of the range declaration shall be subject to enforcement action. For example, a product marked "58-60 in" and found to be less than 58 inches should be considered to be in violation of weights and measures laws and/or regulations.

The second issue concerns the length and width measurements of sheets and pillowcases as noted on the finished packages. Presently, the size measurements noted on the packages are for items *before hemming*. This policy of identifying unhemmed sizes, according to ATMI, has been an accepted trade practice within the industry that has been handed down through the years.

ATMI's Sheet and Pillowcase Group meetings resulted in the following recommendations to their Consumer Affairs Committee:

Request that the 1976 Model State Packaging and Labeling Regulation, which is maintained by the National Bureau of Standards (Department of Commerce) and adopted by NCWM, be amended as follows:

a. 10.9.2. (b) The quantity statement for flat sheets shall

state the size designation of the mattress for which the sheet is designed, such as "twin," "double," "king," etc. The quantity statement also shall state, in inches, the length and width of the mattress for which the sheet is designed, followed in parentheses by a statement, in inches, of the length and width of the finished sheet. [Example: "Double Flat Sheet for 54 x 75 in mattress (81 x 96 finished size)"].

b. 10.9.2. (c) The quantity statement for pillowcases shall state the size designation of the pillow for which the pillowcase is designed, such as "youth," "standard," "queen," etc. The quantity statement also shall state, in inches, the length and width of the pillow for which the pillowcase is designed, followed in parentheses by a statement, in inches, of the length and width of the finished pillowcase. [Example: "Standard Pillowcase for 20 x 26 in pillow (21 x 30 finished size)"].

The committee believes that this change will resolve the enforcement problem between California and the textile industry and recommends adoption of the above changes.

The committee also recommends that the textile industry be allowed, until January 1, 1979, to deplete existing inventories of sheets and pillowcases labeled with "size before hemming" declarations. Additionally, the committee hereby affirms that the intent of the Variations from Declared Dimensions permitted in Section 10.9.3. in no way eliminates the requirement that quantity declarations for textiles must, on the average, not be less than declared declarations.

(The foregoing item was adopted by majority vote.)

MODEL STATE METHOD OF SALE OF COMMODITIES REGULATION

FOOD

1. Sale of Meat by Carcass, Side or Primal Cut

The State of Colorado recommended to the Western Weights and Measures Association that they consider appropriate changes to National Conference Models to limit the sale of beef by the carcass, side or primal cut to wholesale outlets only because of Colorado's assessment that there are serious weights and measures problems related to the sale of bulk freezer beef throughout the nation.

The Western Weights and Measures Association was in agreement with Colorado that the problems are serious but recommended

that the Model State Method of Sale of Commodities Regulation be amended to include a section on freezer beef which is similar to the appropriate section of the City of Dallas, Texas, Weights and Measures Ordinances dealing with freezer meats.

The City of Dallas requirement has been in effect since October 1, 1972 and it has completely eliminated weights and measures problems involving freezer meat sales.

The city of Dallas requirement is essentially as follows:

"Anyone who sells meat by the carcass, side or primal cut and cuts up that meat prior to delivery to the purchaser shall provide the purchaser with a written statement at the time of delivery giving the following information:

1. The name and address of the seller and the date of the sale
2. The total net weight of the carcass, side or primal cut prior to cutting or processing.
3. The price per pound prior to cutting or processing and the total price of the sale.
4. The total net weight of the cut-up and processed meat delivered to the purchaser.
5. An itemized list of any and all charges over and above the original sale price of the carcass, side or primal cuts.

This written statement shall not include the weight of any meat or other commodities received by the purchaser as a bonus offer or gift in connection with the purchase of the carcass, side, or primal cut."

The State of Colorado indicated concurrence with the above position on this matter, and suggested that the National Conference Laws and Regulations Committee consider adding to the proposed method of sale a requirement that the required written statement also include an itemization of individual cuts furnished to the purchaser.

The National Association of Meat Purveyors asked the committee if it planned to include institutional purchasers in the class of purchasers which the proposed regulation would be designed to protect. Additionally, the Industry Committee on Packaging and Labeling expressed some concern about the phrase "primal cut." For example, would a ham which a shopper might ask to have cut into three pieces be a primal cut within the meaning of the proposed regulation?

"The committee, after considering all views including written comments from USDA and others submitted after publication of

the tentative report, now recommends for consideration and adoption the following new section:

SECTION 1.X. SALE OF MEAT BY CARCASS, SIDE OR PRIMAL CUT. Anyone who sells meat by the carcass, side or primal cut and cuts up that meat prior to delivery to the purchaser shall provide the purchaser with a written statement at the time of delivery giving the following information:

1. The name and address of the seller (firm) and the date of the sale.
2. The price per pound before cutting and wrapping and the total price of the sale.
3. The total net weight (hanging weight) of the carcass, side, or primal cut prior to cutting or processing.
4. The total net weight of the cut-up and processed meat delivered to the purchaser.
5. A list by name of all cuts delivered and the quality grade and yield grade, if so graded by USDA.
6. An itemized list of any and all charges over and above the original sale price of the carcass, side or primal cuts.

This written statement shall not include the weight of any meat or other commodities received by the purchaser as a bonus offer or gift in connection with the purchase of the carcass, side, or primal cut. The statement may include a description of whether the sale is from the forequarter or hindquarter.

(The foregoing item was adopted by majority vote.)

2. Instant Concentrated Products

The County of Ventura, California, stated their belief that the main purpose of quantity statements is to facilitate value comparisons. After surveying packages at a local supermarket, they found that some commodities have quantity statements which do not perform this function adequately. They stated that for certain products, such as instant coffee, tea, and cocoa, weight alone is not sufficient. A dual quantity statement is needed. The declaration should state the weight and it should state the size and number of cups (e.g., makes 10 six oz cups) that can be made from the contents. The obvious objection to this reform would center around the strength of the cup of coffee, they feel, but no manufacturer

is going to give directions that will result in an extremely weak cup of product and stay in business.

The National Coffee Association of U.S.A., Inc., offered the following issues which it believes are responsive to this request:

1. The number of servings of instant coffee will depend upon the size of the cup involved and the taste of the individual consumer.

2. The size of a cup will vary widely, ranging from a small "demitasse" cup to a large coffee mug.

3. The taste of the individual consumer defies definition because it will vary as widely as the number of individuals considered. Market research shows many like it "strong and black" and others prefer it "mild and thin."

4. Any statement placed on a container of instant coffee which represents that the consumer will be able to obtain a specified number of servings would be arbitrary, confusing and, in a very real sense, deceptive.

5. In view of the foregoing, any such requirements that the number of servings be listed on a container of instant coffee would expose the manufacturer to complaints from consumers that it was engaging in an unfair and deceptive practice—a type of unwarranted exposure not in the public interest.

Last year the committee was of the opinion that quantity declarations for instant/concentrated products would be more meaningful if the volume yield of total product quantity (when directions are followed) is included in the statement and shown on the principal display panel. The committee, however, did not have ample opportunity to hear from all industry representatives and, therefore, recommended that this issue be deferred until the 62nd Conference.

After careful study the committee now agrees that no recommendation should be made that would require additional information in a declaration of quantity for instant/concentrated products. The major questions which the committee dealt with included the authority to require precise directions (rather than, for example, 2 to 3 heaping teaspoons) and the issues of product variability and uniform enforcement.

(The foregoing item was adopted by majority vote.)

1. Binder and Baler Twine

Last year the Conference adopted a method of sale for baler and binder twine which specified that length declaration in units of the customary system should be in feet and that knot-strength declarations in units of the metric system should be in newtons.

The committee was informed by an industry representative that one state, because of its laws, would require that length declarations be stated in yards. The committee wishes to emphasize that uniformity of weights and measures regulations is a major goal of the Conference. The committee should not continue to debate the merits of feet versus yards or any such provincial preferences. (The committee was in fact persuaded by evidence that farmers preferred "feet.") Additionally, the committee must stress that the establishment of a method of sale for a specific commodity takes the commodity outside the scope of general requirements which are contra to the requirements in that method of sale. This means that State jurisdictions should permit commodities in interstate commerce to be labeled in compliance with their model state methods of sale.

Several industry representatives indicated that the term newton would be somewhat confusing to many farmers, that some equipment for testing knot strength made use of the term kilograms, and that it might be better if the committee would permit declarations of knot-strength to be in kilograms. The committee does not believe that the regulation should require any units except those which the National Bureau of Standards declares to be the correct SI units; however, the committee also believes that rule of reason should prevail during the transition period and enforcement should not be unnecessarily strict.

Work is continuing on the development of a test method and the establishment of an allowable minus difference for the enforcement of the knot strength provision. It is anticipated that these tasks will be completed this fall and the results will be printed in the announcement booklet for the 63rd National Conference.

(The foregoing item was adopted by majority vote.)

2. Carpet and Carpet Padding Materials

The Western Weights and Measures Association recommended that the Committee on Laws and Regulations favorably consider amending the Method of Sale of Commodities Regulation as follows: "Carpet and carpet padding materials shall be labeled and

advertised to state the weight per unit of measure and to accurately identify the product." This problem and the proposed amendment to resolve it were previously recommended by the Western States Weights and Measures Association. The committee felt there was inadequate documentation and justification for the proposed change. The Western States Weights and Measures Association requested such data from their members and transmitted the following findings to the Committee on Laws and Regulations for consideration at their 1976 interim meeting:

A SUMMARY OF RESPONSES INDICATES:

1. There was unanimous support for the amendment.
2. No opposition appeared.
3. Consumer organizations appear to be very concerned and support the amendment.
4. There has been some Federal study (Federal Trade Commission); in addition to consideration by the California Legislature.
5. Retail dealers, as well as individual consumers, need the protection supplied by the proposed regulation. (They show samples of carpets in their stores. After sale, they send order to the supply warehouse, separate from retailer, the carpet layers pick up the carpet, and in many cases the carpet laid is not the weight and texture of the sample. Many times this is not known until many months after carpet is installed. Need to have samples labeled weight per square yard and the rug labeled same as sample. In many instances the retailer is at the mercy of the warehouse firm.)
6. One jurisdiction suggested "Backing of jute or rubber can be single or double layered. Weight can be added to the square by additional latex making it heavier and seemingly of better quality. Accurate identity information should require the type of backing and the type of fiber (continuous filament or stapled)."

The Carpet and Rug Institute informed the committee of the activities currently taking place which involve other Federal agencies. These agencies include the Federal Housing Administration (FHA), Federal Trade Commission (FTC), and General Services Administration (GSA). Of particular note, it was suggested, would be the determination by GSA of the value to consumers of a declaration of the weight per square measure of carpets. It was not an-

ticipated, however, that this information would be available this year. Additionally, the Carpet and Rug Institute felt that the major problem was one of misinformation and pointed out efforts were being made to provide educational information for consumers. One example they cited showed two carpets with different weight per square yard and different pile contents. They stated that if their example items were priced the same, the lighter weight one would have been the better buy.

As a result of this testimony, the committee felt that not enough was known at the time of the 1976 hearings to make a definite recommendation but recommended to the 61st National Conference on Weights and Measures in July that the declaration of net quantity shall also include the weight in ounces per square yard and that the identity statement shall positively identify the fiber content. But after considerable discussion by all sides, a motion was made and seconded to table this item.

After the Conference the City of Baltimore, based on discussions with several City administrators who are responsible for the purchase of carpets, felt that to include unit weight as a requirement would be an error as it may encourage fraud. They indicated that the unit weight can be easily increased by employing heavier backing material which may be of inferior quality and the quality of an oriental carpet is not determined by its unit weight because in many cases the native yarns are light but of high quality material. They concluded that the quality of carpets is a complicated matter not to be handled by the weights and measures inspector weighing the item.

This year, the committee considered a broad array of possible quantity and identity declarations for inclusion in the requirements for a recommended method of sale. They included fiber count, dyed after weaving, heat setting, crush resistance, pile height, backing material, etc. The committee does not believe that it is sufficiently knowledgeable to conclude which, of these elements, if required, might facilitate value comparisons. Indeed, the Carpet and Rug Institute has pointed out a number of problems which would arise if any of the above attributes were required as a basis for value comparisons.

The thinking of the committee, at this time, is that only those elements which are useful without precipitating confusion should be requirements of a method of sale. These elements should be included as a required part of an invoice or delivery ticket.

The committee therefore recommends for consideration and adoption the following new section:

> **SECTION 2.X. CARPETING.** Anyone who sells carpeting shall provide the purchaser with written statements at the time of sale giving the following information:

1. The name and address of the manufacturer.
2. The style name and roll number of the carpet.
3. The generic name of the fiber and the type of backing material.
4. The unit delivered (exact size shipped).
5. The price per square yard and the total price.

The effective date for this Section shall be January 1, 1979.

(The foregoing item was adopted by majority vote.)

3. Hardwood Lumber

Last year the Western States Weights and Measures Association (WSW&MA) asked NCWM to adopt a resolution in support of its position concerning trade practices in the hardwood lumber industry.

It further recommended that the executive secretary of NCWM or a standing committee of NCWM contact the National Hardwood Lumber Association (NHLA) to secure that organization's support and assistance in changing industry trade practices.

The following statement was based on information provided to the WSW&MA by the State of California and the Southern California Hardwood Lumber Association:

> Hardwood lumber is sawn in standard thicknesses and random widths and lengths. It is sold at the wholesale level either green or kiln dried, and at retail as kiln dried. Basis for trading is board feet net tally. While not universal, it is a common practice in some areas selling hardwood lumber kiln dried to add back to the net tally the shrinkage loss from drying. As a result, the actual price per unit is understated, and the actual quantity delivered is overstated. This practice should be eliminated so that sales invoices reflect actual quantities delivered and so that price representations are correct. If all weights and measures jurisdictions enforce existing laws and regulations, the practice can be controlled.

The executive secretary of the NCWM contacted the National Hardwood Lumber Association as requested and responded to the FTC after they had been asked to inquire into the matter. It was generally felt at the time that a reasonable and acceptable solution was achievable and could be set forth by this committee in this report. The Committee on Laws and Regulations must now report that this feeling may be somewhat optimistic.

After the 1976 interim meetings NHLA presented the following suggestion (which contains revisions discussed with the committee at the Conference) for the sale of hardwood lumber.

a. Hardwood lumber which has been measured after kiln drying shall be quoted and invoiced with no measurement addition for kiln shrinkage, unless otherwise agreed in a prior written negotiated contract between buyer and seller; in which case the basis of measurement and the percentage added for kiln shrinkage shall be conspicuously stated on each quotation and invoice.

b. Hardwood lumber which has been measured prior to kiln drying may be quoted and invoiced on green or air dried measurement, provided that the quotations and invoices conspicuously state that the lumber was measured prior to kiln drying.

After careful consideration of the position taken by NHLA and all other information received during the closed and open hearings, the majority of the committee believed that other suggestions were more consistent with basic weights and measures principles and the 61st NCWM was asked to consider the following new section:

SECTION X. HARDWOOD LUMBER.—All sales of hardwood lumber whether green or dry, shall be made on the basis of net board footage as delivered to the purchaser.

After last year's discussion, the item was tabled by majority vote.

This year the committee agrees with a modified version of the first choice of three new proposals of NHLA and recommends for consideration and adoption the following new section:

SECTION 2.X. HARDWOOD LUMBER.—Sales of hardwood lumber measured after kiln drying shall be quoted, invoiced and delivered on the basis of net board footage, with no addition of footage for kiln drying shrinkage. Sales of hardwood lumber measured prior to kiln drying shall be quoted, invoiced and delivered on the basis of net board footage before kiln drying. If the lumber is to be kiln dried at the request of the purchaser, the kiln drying charge shall be clearly shown and identified on the quotation and invoice.

(The foregoing item was adopted by majority vote.)

5. Insulation

A citizen's complaint registered with the Bureau of Consumer Protection and Environmental Health, Milwaukee, Wisconsin, about

the amount of pouring insulation received in a purchase was forwarded to NCWM by Wisconsin weights and measures officials.

The officials made a thorough investigation and learned that there is no uniform trade practice as to the method of sale for pouring insulation. Some of the quantity declarations found include the following:

10 pounds average weight
4 cubic feet when properly applied
Net weight—Not less than 12 pounds
3 cubic feet
Compression packed to 3 cubic feet
3 cubic feet, approximately 10 pounds net
23½ pounds net
Approximately 4 cubic feet
5 cubic feet when packed
20 pounds net

Also listed in the survey results were packages with no quantity declaration and one package with no identity or quantity declaration.

The petition to NCWM concluded that there was a need for establishing a method of sale for insulation. It was further stated that since there has been a great deal of activity in the promotion and sale of insulating materials to combat the energy crisis, we feel that the consumer who buys these products should be able to do so on a fair and equitable basis.

Last year industry representatives from various segments of the pouring insulation industry discussed with the committee the various types of pouring insulation, the existing standards, and the informational needs of the consumer.

The National Cellulose Insulation Manufacturers stated that their industry generally endorses nationally recognized standards in a given product area. The Federal Specification HH-I-515 C requires that the package shall be marked with the minimum weight of insulation per bag and also show the coverage of the insulation. The Association believes that coverage tables should be predominantly incorporated on the container. Thermal insulation is purchased to fulfill these characteristics and such terminology is commonly accepted in the field.

The requirement also exists in the specification that the minimum weight shall be shown on the container. This, they feel, can only lead the purchaser to the conclusion that the weight of the bag is of primary importance in the purchase of thermal insulation, a misleading concept. Because of this, they strongly recommend that "R" values (a measure of the ability of the insulation to resist the

passage of heat or cold) and coverage of material be made the dominant marking on the bag for the guidance of the consumer and that the minimum weight of the insulation be made a subordinate item for the guidance of a field inspector. The Association, therefore, urged that NCWM move to rectify this matter.

The committee agreed and expected to recommend to the 61st NCWM a new section to be included in the Model State Method of Sale of Commodities Regulation, which would set forth a quantity declaration requiring the coverage as a designated "R" value and the net weight. Industry representatives were asked to recommend to the committe an appropriate "R" value which would become the basis for a uniform method of sale for insulation. However, the committee's findings indicated that this issue should be broadened to include insulation in forms other than pouring types and broadened so as to provide weights and measures protection for consumers who have insulation installed by contractors.

The committee, with assistance from the National Bureau of Standards and representatives from industry, reviewed this issue up to and through the interim meetings and believes that a recommendation as set forth in the interim report should be made which would include only that information which is essential for the consumer to make value comparisons.

In a statement dated June 21, 1971, before the Subcommittee on Energy Conservation and Regulation, Senate Committee on Energy and Natural Resources, on the President's Energy Proposal, Dr. Ernest Ambler, Acting Director, National Bureau of Standards made the following points:

> The National Bureau of Standards (NBS) supports the President's National Energy Plan and the energy conservation measures . . . that uniform measurement technology, standards, and accurate technical information are essential bases for the millions of decision makers upon whose actions the very success of these measures depends.
>
> The mission of NBS, expressed in its enabling legislation, is the development and use of measurement technology, standards, and data for the public benefit. Our laboratory and field researchers support consumers, industry, and Government alike. We have had considerable experience in the area of energy conservation over the last six years.
>
> The proposed conservation measures are based on technology of demonstrated effectiveness for saving energy. In general, the overall picture regarding standards for materials and installation practices is adequate. However, it is our general experience that whenever specific changes are made such as more or new insulation in housing, we have to be careful to avoid unexpected side effects.
>
> For example . . . the fire hazard due to exposed foam plastic insulation has been amply demonstrated in laboratory tests. The situation has been recognized and as a result all model building codes now require that foam

plastic insulation materials installed in walls or ceilings of residences be covered with at least a half inch of gypsum board or its equivalent. However, the situation with respect to installation under floors, such as in basements or crawl spaces is not clear and may require further remedial actions in codes and/or standards. Relevant to this, new test methods remain to be developed . . . to accurately and adequately characterize the fire hazard of these materials. Further, fire risks in a building can be increased significantly by almost any insulation material if improperly installed. . . . A second possible side effect of these measures is potential moisture buildup and the requirement for greater protection against condensation by use of ventilation or vapor barriers. Otherwise, there are unwanted consequences of fungal growth, odors, and harmful effects to interior and exterior finishes and furnishings.

Another example of unwanted consequences concerns material degradation. Our own studies of a particular foam insulation represent a good case in point. In situ measurements of this foam in the NBS test house showed a constant linear rate shrinkage over a period of 26 months and it had not leveled off. Total linear shrinkage at that time was 8.1 percent. Although this material had very low thermal conductivity when measured in the laboratory, under the conditions of shrinkage experienced in the field its effectiveness in use is seriously diminished.

We are presently working with . . . others in addressing these mechanisms such as model codes, test methods, field inspection tools, training materials, and so forth.

I do not regard these problems as insuperable. They will require the cooperation of many different groups which I am confidnt will be achieved.

Because of these complications the committee therefore recommends that the suggested SECTION 2.X. INSULATION be used as a guideline and that the conference continue to seek guidance from NBS and other interested persons in our efforts to resolve this complicated issue.

After lengthy discussion a motion was passed to make the following changes: Pouring type insulation should be changed to loose fill insulation wherever it appears in Section 2.X.1.; The words "and net weight." should be added to the end of 2.X.1.; "Net Weight 30 lb." should come at the end of the example following 2.X.1. The guideline now read as follows:

SECTION 2.X. INSULATION

2.X.1. Packaged Loose Fill Insulation.—Packaged loose fill insulation shall be sold on the basis of coverage in square feet, the recommended installed thickness, the insulation resistance "R" value obtained, and net weight.

Example: Contents will cover 26 square feet when installed at 6½ inches with a resistance value of R-19. Net Weight 30 lb.

2.X.2. Batt or Roll-Type Insulation.—Shall be sold on the basis of coverage in square feet, the designated "R" value and the width and length of the batt or roll.

Example: Covers 26 square feet and provides a value of R-19. Roll is 12 inches wide by 26 feet long.

2.X.3. Installed Insulation.—Installed insulation shall be sold on the basis of coverage in square feet, the insulation resistance obtained, and the seller or applicator shall provide the purchaser with an application statement.

Example of application statement: Insulation covering 1290 square feet of area has been installed in conformance with manufacturer's recommendations to provide a value of R-19.

(The foregoing item as amended was adopted by majority vote.)

5. Polyethylene Products

On July 1, 1975 the State of Oregon brought to the attention of the Western States Weights and Measures Association and raised for discussion (and possible action) the desirability of including in either the NCWM Model Packaging and Labeling Regulation or Method of Sale of Commodities Regulation, specific provisions for polyethylene film.

The petition stated that there is a definite need for jurisdictions to have specific requirements on labeling or fill that can readily be enforced and recommended consideration that language similar to the following be proposed for adoption by the Western Association:

SECTION 2.X. POLYETHYLENE FILM.

Packages of polyethylene sheeting in rolls containing at least 100 square feet of film 10 mils (0.010 inch) or less in thickness shall bear a combination declaration of quantity in terms of the nominal length, width, thickness and net weight. The allowable difference between actual and nominal quantities shall be as follows:

(a) Length: The length of sheeting per roll shall be within minus 1 percent to plus 3 percent.

(b) Width: The width of sheeting shall be within plus or minus one-eighth inch per foot of nominal width. Sheeting less than 1 foot wide shall be within plus or minus one-eighth inch.

(c) Thickness: The thickness of sheeting at any point shall be not less than 80 percent of the nominal thickness.

(d) Net Weight: The net weight of the packaged rolls of sheeting shall be not less than the nominal net weight. The nominal net weight shall be calculated as follows:

$$W = T \times A \times 0.03613D$$

Where: W=nominal net weight in pounds and tenths
T=nominal thickness in inches
A=nominal length in inches times nominal width in inches
D=density in grams per cubic centimeter as determined by ASTM D 1505-68 Standard Method of Density of Plastics by the Density-Gradient Technique, using three specimens.
0.03613=factor for converting g/cm^3 to lb/in^3.

At the 1975 Western States Weights and Measures Association it was proposed by an industry representative that a recommendation should be made to the National Conference on Weights and Measures to institute guidelines from which the various states and municipalities can formulate laws and labeling standards pertaining specifically to polyethylene bags.

It was pointed out that discrepancies occur regularly between buyers and sellers of polyethylene bags and all too often the consumers of polyethylene bags are receiving less than is purchased either in the form of too few bags or too thin bags.

To provide for consistency of quality in all polyethylene bags it was therefore proposed that a recommendation be made to require manufacturers to label in compliance with the following standards:

1. A statement of quantity (number of bags) within every package.
2. A statement of size expressed in inches of the width and length of the bags. Expressed in width, depth and length in the case of gusseted bags.
3. A statement of thickness expressed in mils.
4. A statement of the net weight expressed in pounds and decimal fractions of pounds of every case.

It was felt that the combination of these four (4) elements of labeling would insure common quality between manufacturers to all consumers and that all four requirements are essential, but particular emphasis should be placed on net weight as the most accurate for quality testing.

The Western States Weights and Measures Association then recommended that the National Conference on Weights and Meas-

ures develop the appropriate amendment, either to the Model State Packaging and Labeling Regulation or to the Model Method of Sale Regulation, to provide that there be a required quantity declaration for packages of polyethylene film products in terms of length, width (and depth in case of gusseted bags), thickness of film, number of separate or separable sheets or bags in the package, and net weight.

Hearings were held by the Laws & Regulations Committee at the 61st National Conference on Weights and Measures interim meeting on January 28, 1976.

The Laws and Regulations Committee carried forward, without extensive deliberation, the recommendations by the Western States Weights and Measures Association in its tentative report to the full National Conference on Weights and Measures. (See annual bulletin of 61st National Conference on Weights and Measures pages 90-92.)

The Federal Trade Commission in response to the tentative report stated that the proposed section recommends an exception to the labeling of bi-dimensional commodities now contained in Federal regulation as well as the Model Packaging and Labeling Regulation. If the committee and the Conference feel that these regulations should be modified for all polyethylene film (including roll film sold at retail) the proposal should be presented to the Commission so that a coordinated, uniform and timely change can be made in both Federal and State regulations.

Current Federal Trade Commission regulations require a quantity declaration in terms of square feet followed in parentheses by length and width in largest whole unit (yards, feet) with remainder in inches or fraction of largest whole unit.

The Federal Trade Commission stated that if a statement of thickness is desirable, it should be added by modifying section 10.8.1. (a) of the Model Packaging and Labeling Regulation. The Federal Trade Commission indicated the net weight on plastic bags does not appear to be a justifiable measurement in terms of aiding accuracy or consumer value comparison. They require that bags and liners be:

> Measured in terms of count and dimensions (width $\times$ length OR width $\times$ depth $\times$ length) expressed in inches up to two (2) feet. A dimension of 2 feet or over will be expressed in feet with any remainder in inches or decimals or fractions of a foot.
>
> Thickness of a bag or liner may be expressed in mils and, when used, is part of the net quantity statement.
>
> Capacity and/or capacity relationship to permanent container, when used, is part of the net quantity statement.

The Federal Trade Commission also felt that variations should be left to NBS Handbook 67 procedures. (It is anticipated that a draft of NBS Handbook 67 could be available in 1977.)

The State of New Jersey pointed out that the suggested standard for polyethylene film thickness permits the sheeting to be "not less than 80% of the nominal thickness" and without an additional statement that the average thickness must equal the declared thickness, cannot stand since it would permit the manufacturer to distribute sheeting 20% short of the declared thickness.

New Jersey recommended the following change to the proposed SECTION X. POLYETHYLENE FILM . . . (c) Thickness: The thickness of sheeting at any point shall not be less than 80 percent of the nominal thickness <u>but the average shall not be less than the declared thickness.</u>

In its final report to the Conference the Laws & Regulations Committee recommended that this item be tabled until 1977.

The Western States Weights and Measures Association at their 1976 Conference officially transmitted a recommendation from the California Film Extruders Association that the National Conference adopt a method of sale which would be the same as the current State of California regulation relative to polyethylene products with one exception. That exception is that a statement of net weight should be required for both consumer and nonconsumer packages.

The California regulations are as follows:

POLYETHYLENE COMMODITIES—LABELING AND TESTING

2980. Labeling and testing requirements for polyethylene Commodities.

2980.1. Polyethylene Sheeting. The term Polyethylene Sheeting shall be construed to mean sheeting of 10 mils (0.010 inch) or less in thickness. The sheeting shall be made from polyethylene or modified polyethylene, such as an ethylene copolymer consisting of a major proportion of ethylene in combination with a minor proportion of some other monomer, or a mixture of polyethylene with a lesser amount of other polymers. It may contain additives or modifiers such as pigments and stabilizers.

2980.2. Polyethylene Bags, Lay Flat Tubing, Sheets, Drop Cloths and Tarpaulins. The term Polyethylene Bags, Lay Flat Tubing, Sheets, Drop Cloths and Tarpaulins shall be constructed to mean commodities manufactured with thicknesses of 10 mils (0.010 inch) or less. The commodities shall be made from polyethylene or modified polyethylene, such as an ethylene copolymer consisting of a major proportion of ethylene in combination with a minor proportion of some other monomer, or a mixture of polyethylene with a lesser amount of other polymers. It may contain additives or modifiers such as pigments and stabilizers.

2981. Quantity Declarations.

2981.1. Consumer Packages. The declaration of the quantity of contents of polyethylene sheeting in consumer packages shall be expressed in terms of (a) thickness expressed in mils (0.001 inch), and (b) width and length.

2981.2. Nonconsumer Packages. The declaration of the quantity of contents of polyethylene sheeting in nonconsumer packages shall be expressed in terms of:

(a) Thickness expressed in mils (0.001 inch).

(b) Width and length.

(c) Net weight in Avoirdupois pounds with any remainder expressed in common or decimal fractions of a pound. A decimal fraction shall not be carried out to more than two (2) decimal places.

2981.3. Rolls, Bales, Bags, and Sheets. The declaration of the quantity of contents of rolls, bales, or containers of polyethylene bags and sheets shall be expressed in terms of:

(a) The count of usable units.

(b) Width and length of each unit. Dimensions of gusseted bags will be expressed as width, depth, and length.

(c) Thickness in mils (0.001 inch).

(d) A statement of weight on nonconsumer commodities in roll form.

2981.4. Drop Cloths and Tarpaulins. The declaration of the quantity of contents of drop cloths and tarpaulins shall be expressed in terms of:

(a) The width and length in largest unit of measure.

(b) The thickness expressed mils.

2981.5. Lay Flat Tubing. The declaration of the quantity of contents of lay flat tubing shall be expressed in terms of:

(a) The width in inches.

(b) The length in feet.

(c) The thickness expressed in mils (0.001 inch).

(d) Net weight expressed in Avoirdupois pounds with any remainder expressed in common or decimal fractions of a pound. A decimal fraction shall not be carried to more than two (2) decimal places.

2982. Inspection and Test Procedure.

2982.1. Width and Length. Measurements of width and length shall be made with a calibrated steel tape, using the following procedures.

Extend the commodity to be tested to its full dimensions. Remove all creases and folds, insofar as practical, without applying stresses that cause any significant flow.

(a) Bags, Sheets, Drop Cloths, and Tarpaulins. Make three (3) measurements uniformly distributed along the width of the sample and three (3) measurements uniformly distributed along the length of the sample. Compute the average of each.

(b) Roll Type Sheeting. One (1) length measurement shall be made. Make ten (10) measurements uniformly distributed along width of sheet. Compute the average width.

(c) Lay Flat Tubing. One (1) length measurement shall be made. Make a minimum of ten (10) measurements uniformly distributed along width of the tubing. Compute the average of the width measurements.

2982.2. Thickness. This test shall be conducted by using a deadweight dial micrometer with a flat anvil of one-fourth (¼) inch diameter in area and a three-sixteenths (3/16) inch diameter on the head of the spindle. The load applied to the spindle shall be four (4) ounces. One thickness of material shall be measured at one time.

(a) Drop Cloth and Tarpaulins. Three (3) measurements uniformly spaced shall be taken across the web (flow) of the sample. Compute the average.

(b) Bags. Six (6) measurements uniformly spaced shall be taken around the circumference of the sample. Compute the average thickness.

(c) Roll Type Sheeting. Five (5) measurements shall be made across the end of sheet. These measurements shall be taken at a minimum distance of three-fourths (¾) of an inch from the edge being tested. Compute the average thickness.

(d) Lay Flat Tubing. A minimum of six (6) measurments uniformly spaced shall be taken around the circumference of the sample. Compute the average thickness.

The Western States Weights and Measures Association urged the National Conference to finalize a definitive method of sale for polyethylene products during the 1977 National Conference and stressed that nothing in its report should be construed as changing in any way the Western Association's position on polyethylene commodities which was adopted during the 1975 Western Conference. This position was supported by the California Association of Weights and Measures Officials.

The State of California outlined the problem as follows:

1. Polyethylene Sheeting shipped into California from other states and some sheeting manufactured here was not always properly labeled to indicate the true measure of the commodity.

2. Sheeting, when labeled, did not conform to the statements placed on the containers.

3. Industry members alleged they were following the National Bureau of Standards Product Standard, PS 17-69, which superseded Commercial Standard CS 238-61.
   The requirement for thickness, 3.3.2.1., PS 17-69, states that "the thickness at any point, when measured in accordance with 4.6.1. shall not be less than 80 percent of the nominal thickness." This was construed to mean that Polyethylene Sheeting (construction, industrial, and agricultural) could average *20 percent less* than the indicated mil thickness. Tests con-

ducted by our personnel found that the sheeting was 20 percent less than stated.

4. Voluntary standards, PS 17-69, are not enforceable and apply only to those firms which accept their responsibility to the consumer and other industry members for fair competition.

California officials also felt that their regulations could serve as a starting point for committee deliberations.

The Consumer Plastic Wrap and Bag Group (CPWBG) of the National Flexible Package Association (NFPA) stated that they were in agreement that mil thickness can be printed on consumer packaging as useful information to the consumer. However, they felt that the weight should not be included as required information on consumer packaging because the mil thickness serves this purpose and weight has no bearing or indication of bag strength or performance.

They also presented a procedure for sampling and testing based on the "average concept" rather than the "allowable variation concept." At the hearings CPWBG stated that they did not feel that it would be necessary to put the net weight of the contents of the package on the label. They felt the gauge would be a more meaningful term indicating the quality of the product within the package and until a satisfactory system of developing a performance standard can be made, the mil gauge would be sufficient.

The National Flexible Package Association offered the following suggested change (to eliminate sheeting for consumer use) to the first paragraph of the original proposal:

SECTION X. POLYETHYLENE FILM.

Packages of polyethylene sheeting, for commercial or industrial use, in rolls containing at least 100 square feet of film 10 mils (0.010″) or less in thickness shall bear a combination declaration of quantity in terms of the nominal length, width, thickness and net weight.

The NFPA suggested the following for bags:

SECTION X. CONSUMER USE POLYETHYLENE DISPOSER BAGS.

Retail consumer packages of polyethylene bags for waste disposal (not including food storage and sandwich size bags) shall bear a combination declaration of quantity as follows:

a. A statement of quantity (number of bags) within every package.

b. A statement of size expressed in inches of the usable width and length in the case of gusseted bags.

c. A statement of thickness expressed in mils.

Inspection, tolerances and enforcement shall be according to methods and procedures for polyethylene bags and film products recognized by National Bureau of Standards Office of Weights and Measures for inclusion in Handbook 67.

At the 1977 interim meeting the Laws & Regulations Committee asked the Office of Weights and Measures for assistance and a study was assigned to determine if thickness labeling on plastic trash bags would provide a useful value comparison for consumers. The study recommended that mil thickness not be required labeling to provide a qualitative value comparison. The study concluded that mil thickness can be required as a legitimate dimensional statement of quantity describing a trash bag although that is of little value to the consumer; thickness is not believed to be an adequate enough indicator of quality to have integrity as a value comparison base.

After considering all views, the committee recommends for consideration and adoption the following new Section:

SECTION 2.X. POLYETHYLENE PRODUCTS. Consumer products sold at retail shall be labeled with the following elements:

2.X.1. Sheeting.

a. length and width
b. area in square feet
c. thickness

2.X.2. Food Wrap and Film.

a. length and width
b. area in square feet

2.X.3. Lawn and Trash Bags.

a. count
b. dimensions
c. thickness

2.X.4. Food and Sandwich Bags.

a. count
b. dimensions

All products not intended for the retail consumer shall be labeled with the following elements:

2.X.5. Sheeting.

a. length
b. width
c. thickness
d. weight

2.X.6. Bags.

a. count
b. dimensions
c. thickness
d. weight

A declaration of thickness for all polyethylene products shall not be less than the average thickness based on sampling procedures and test methods recognized by the National Bureau of Standards. A declaration of area shall comply with "largest whole unit" requirements. A declaration of dimensions for all polyethylene bags shall be width x length or width x depth x length.

(The foregoing item was adopted by majority vote.)

GENERAL

1. Metric Package Quantity Standards

The Northwest Weights and Measures Association requested that the Laws and Regulations Committee give thought to recommending uniform sizes of consumer products in even number units, such as the proposed alcoholic beverage sizes of 500, 750, 1,000, and 1750 mL; as well as even numbered weight declarations on standard packs, such as 200, 250, 300 grams, etc. Additionally, a representative for the plastic returnable bottle industry asked the Conference to take appropriate steps to revise the model regulation to permit the refillable 3-litre size to be a legal container or legal package for milk. The petition pointed out that metric sizes will be required someday, conventional sizes will be illegal someday and

any delaying action such as "soft metric" is inconsistent with wise investment by proponents of the refillable system. Reports indicate that by the end of 1977, milk will be sold in litres in every province in Canada; one-litre cartons will replace the two-quart size, and four-litre containers will replace the three-quart jug.

In a letter to the NCWM Liaison Committee the Milk Industry Foundation set forth the thought that if we are going to convert to metric we should know as soon as possible those states, regions, etc. which do have regulations which would not permit the uniform adoption of metric sizes, and other groups would like to see the results of such a survey as well.

During the interim meeting the committee received a petition on behalf of many dairy bottlers and the developer of a returnable milk container made from plastic to amend the Model State Method of Sale of Commodities Regulation and the Model State Weights and Measures Law to provide for metric sizes, ¼ litre, ½ litre, 1 litre, and multiples of a litre. The petitioner stated that dairies have requested over a million bottles from their first production run this year and are being delayed until a change in the regulations proposed herein is made. Great pressure is being brought by environmental and returnable container legislation to obtain a returnable container now. They want to introduce the best container possible which won't have to be replaced at great cost later. Several problems deter entry into the market place with a non-metric container. The considerations include:

1. Increased cost and waste of packaging materials.
2. Confusion for dairies and consumers, and
3. Delay in obtaining a desirable, returnable container with consequential continuing pollution problems.

A statement by a jug milk operator urged the committees to give very serious thought to this entire matter, since the use of returnable containers is on the increase because of the energy crisis, and expressed hope that metrication would not stand in the way of encouraging dairies and consumers to buy more and more of their foods in returnable containers.

He stated that if it is decided at some point to require the dairy industry to metricate their containers then a well planned program should be considered so that consumers would not ultimately be penalized for the high cost of conversion.

The Milk Industry Foundation authorized its staff to undertake a comprehensive study and to explore specifically the following areas:

1. What are the antitrust implications of hard metric conversion (e.g., in what manner can the establishment of new container capacities be legally selected without adversely affecting individual suppliers and milk processors)?

2. What would be the economic impact of hard metric conversion (is present machinery capable of handling metric containers, what is the availability of manpower to make necessary equipment changes, and are changes in the federal order milk program required, etc.)?

3. What are other factors and how are other segments of the food industry approaching the subject and what impact will this have on the consumer?

The committee believes that the barriers to the introduction of round metric sizes should be removed for all products under the Model State Method of Sale of Commodities Regulation.

This is consistent with the position taken by the Department of Commerce with respect to its authority under the Fair Packaging and Labeling Act. Roundness for each commodity will depend on many factors which include the number of current sizes, the range and pattern of those sizes, proposed and existing foreign metric sizes, and productivity and distribution considerations. The committee therefore recommends for consideration and adoption the following new section:

SECTION 3.X. PACKAGED COMMODITIES IN ROUND METRIC UNITS. Notwithstanding any other provision of this regulation, commodities shall be allowed to be sold in round metric sizes.

(The foregoing item was adopted by majority vote.)

C. H. Vincent, *Chairperson*, Texas
J. T. Bennett, Connecticut
J. L. O'Neill, Kansas
R. W. Probst, Wisconsin
D. I. Offner, St. Louis, Missouri
T. N. Troy, Staff Assistant, NBS
H. F. Wollin, *Exec. Secy.*, NCWM

Committee on Laws and Regulations

(On motion of the committee chairperson, the report of the Committee on Laws and Regulations was adopted in its entirety by the Conference by majority vote. The Conference also authorized the Executive Secretary to make any appropriate editorial changes in the language adopted by the Conference, provided that the requirements thus adopted are strictly adhered to.)

REPORT OF THE COMMITTEE ON EDUCATION, ADMINISTRATION AND CONSUMER AFFAIRS

Presented by W. B. Harper, *Chairperson;*
Chief, Bureau of Weights and Measures,
Department of Inspection Services, Birmingham, Alabama

(Thursday, July 21, 1977)

The Committee on Education, Administration, and Consumer Affairs submits its final report to the 62nd 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 open meeting of the committee.

NATIONAL WEIGHTS AND MEASURES WEEK

Mr. William Korth of Ventura County, California who served as both the 1976 and 1977 national chairperson for the week is sincerely commended by the committee for his national leadership in securing promotional materials and particularly for his efforts in bringing the attention of the U.S. Congress to the importance of weights and measures week. Mr. Korth communicated with all States, the District of Columbia, Puerto Rico and the Virgin Islands, and this year added thirteen of the larger city jurisdictions, asking each jurisdiction to name a weights and measures week coordinator to serve primarily as contact to receive the *free* promotional material supplied by the various organizations. The committee is extremely disappointed and distressed at the fact that only 34 replies were received to Mr. Korth's request. The replies included 29 States, Puerto Rico, the Virgin Islands and three city jurisdictions. No replies were received from the following States: Alaska, Arizona, Hawaii, Kentucky, Louisiana, Maine, Maryland, Minnesota, Mississippi, Montana, New Hampshire, New Jersey, New Mexico, North Dakota, Texas, Utah, Vermont, West Virginia, and Wisconsin. The cities of Washington, D.C.; Denver, Colorado; Kansas City, Missouri; Indianapolis, Indiana; St. Louis, Missouri; Chicago, Illinois; Detroit, Michigan; Louisville, Kentucky; Miami, Florida; Pittsburgh, Pennsylvania; and New York, New York also failed to

reply. The committee hopes that by publishing this list, it will encourage those jurisdictions that did not respond to correct this oversite in the future so that we may look forward to 100% participation.

Once again the committee is grateful to Ray Lloyd and the Scale Manufacturers Association for supplying each jurisdiction with weights and measures week promotional kits and bumper stickers. Much of the success for the week must go to them for their assistance. Sincere thanks is also extended to Ellis Fitzgerald and Fairbanks Weighing Division of Colt Industries for printing and distributing 10,000 "Third Man" posters. These were initially distributed 100 copies per jurisdiction with a request blank for more if needed. Sincere appreciation is also extended to Tom Stabler and Toledo Scale Division of Reliance Electric Company for providing 100,000 gummed weights and measures week seals for affixing to envelopes and correspondence. Publicity and a request for support in publicizing the week were sent to ABC, CBS, NBC, Mutual Broadcasting, "Grocers Journal," "American Metric Journal," "Metric News," "Weighing and Measurement," and the "National Petroleum News." The effort to secure a resolution from Congress asking the President of the United States to designate the period of March 1 through 7 as national weights and measures week will continue. The committee is grateful for the support received from weights and measures officials for this project.

To continue the established process of naming a national weights and measures week chairperson during the committee's interim meeting, Mr. Steve Malone, Administrator, Weights and Measures, P.O. Box 94757, Lincoln, Nebraska 68509, was named by the committee to serve for the 1978 observance. After thorough discussion and consideration of the magnitude and importance of national weights and measures week, the committee now recommends that each of the four regional weights and measures associations name a regional chairperson to represent their association and to work with the national chairperson in providing needed assistance for the promotion of the week.

WEIGHTS AND MEASURES PROMOTIONAL ACTIVITIES

1. Weights and Measures Commemorative Medallion.—The committee still has on hand approximately 30 bronze medallions for sale at $7.50 each. Since the Franklin Mint has destroyed the dyes for the medallion, the project will end when these medallions are sold.

2. National Conference Self-Adhesive Decals.—Several thousands of the attractive Conference decals are available for sale to

organizations or individuals at very modest cost. A supply of both the medallions and the decals will be available for sale during the National Conference in Dallas and at other regional and State conferences. Mail orders will continue to be honored until the supply is exhausted.

3. "Whatta Family" Slide and Tape Series.—Bill Korth advises that $171.29 has been realized from this project. Nine sets of the slide and tape series will be available for sale at $33 per set through October 1977. Orders should be addressed to William Korth, Weights and Measures, 608 El Rio Drive, Oxnard, California 93030.

ADDITIONAL METRIC SEMINARS

In addition to the six seminars that were held for weights and measures officials during the past year, three seminars have been held at the National Bureau of Standards (October 1976, November 1976 and March 1977). These seminars will be continued as long as sufficient response is obtained. The States that did not participate in the core group training should consider taking advantage of the opportunity to send someone to one of the NBS followup seminars.

Mr. Jeffrey Odom, metric coordinator in the Office of Weights and Measures, surveyed the original core group to determine what use had been made of the instruction received and also to establish future needs in this area. Response to the survey was excellent and a request for more metric equipment and information was indicated. Mr. Odom reported to the committee that an informal monthly metric newsletter would be developed and sent to the core group as soon as possible. Mr. Odom also discussed with the committee plans for incorporating metric training as part of the present weights and measures training program conducted by the Office of Weights and Measures. The committee is grateful to Mr. Odom for his interest and efforts in the area of metric training and wholeheartedly endorses this project.

Since the issuance of the tentative report, the Office of Weights and Measures has developed a one-day metric workshop that has been field tested and is now being offered as part of the annual three- or four-day weights and measures seminars conducted throughout the United States.

The 61st National Conference on Weights and Measures received the final report on the model metric training program developed and conducted under National Bureau of Standards contract No. 6-35752 which had the objective 'to develop and conduct metric training programs for high level weights and measures officials

in private industry and local, State and Federal Governmental agencies."

The Committee on Education, Administration, and Consumer Affairs of the 61st NCWM endorsed that program and recommended it to the Conference in its final report. The Conference adopted the report.

One of the recommendations in the final report of the contract called for the preparation of audio-visual and other instructional aids for use with the program in the future. As the NCWM and NBS have not been able to secure additional funds for the preparation of that new material, private industry has taken the initiative for its preparation.

The "Intrometric" training program published by Creative Universal, Inc., and authored by John Landvater and Margo Perkins has been reviewed by the Committee on Education, Administration, and Consumer Affairs and has been found to present the necessary materials for teaching the program created under the NBS contract 6-35752.

PRODUCTION OF NEW WEIGHTS AND MEASURES FILM

Several meetings have been held with appropriate NBS officials regarding additional required funding and support for a new weights and measures film. The committee has been advised by the NBS motion picture expert that a quality 12 to 15 minute color film will cost in the neighborhood of $25,000. The committee presently has about $7,000 realized from recent promotional activities, and is attempting to secure the additional $18,000 plus the cost of extra prints to put into the NBS loan service from sources at NBS.

At this time the committee is happy to report that the necessary funding has been obtained, bids solicitation has been completed, and proposals received. A contract will be let within the next 30 days with a completion date of November 1, 1977.

The committee calls to the attention of weights and measures officials the excellent new NBS film, "Standards for Excellence" which was released during the past year and is now available for purchase or free loan. Loan requests should be directed to:

Associated Films, Inc.
366 Third Avenue
New York, N.Y. 10022

OWM TECHNICAL TRAINING PROGRAM

In the committees' report from both the Southern and Western Weights and Measures Associations, full endorsement is given to the OWM technical training program with a plea for additional

metric training. This item was thoroughly discussed during the interim meeting and additional metric training will be provided as reported earlier in this report.

Consideration is presently being given to the possibility of grouping three or more States together on a regional basis for the purpose of spreading the OWM training resources over a wider base. Also, the need for additional supervisor schools involving supervisory personnel from twelve to fifteen States at a time is recognized.

The committee wishes to endorse and extend its appreciation to Mr. Ellis Fitzgerald of Fairbanks Weighing Division of Colt Industries for the training program consisting of mechanical and electronic scale principles he has developed for weights and measures officials. In an effort to conserve State and local resources, OWM training has been provided in a few jurisdictions at the same time the scale principles' training was provided. The committee will continue to pursue ways in which training at all levels can continue to be provided.

COMMITTEE SURVEY

Response to the committee survey regarding model laws and regulations, Handbook 44 and registration of servicemen was excellent. Forty-one States and most of the county and city jurisdictions promptly returned the completed survey form.

This survey was developed by the Education, Administration, and Consumer Affairs Committee of the National Conference on Weights and Measures (NCWM) in conjunction with the Office of Weights and Measures (OWM) of the National Bureau of Standards (NBS). It was designed (1) to collect data to evaluate the usefulness of the Model Laws and Regulations, NBS Handbook 44, etc.—developed by the National Bureau of Standards OWM (through the NCWM); (2) to aid in determining the extent of uniform regulation in weights and measures laws and regulations throughout the United States; and (3) to provide information to accurately respond to continuing inquiries from industry, government, and the public in the areas concerned.

While it was thought that all States use or adopt the Model State Weights and Measures Law, the survey revealed that eleven States have not adopted it. These States, along with the twelve * that did not respond, are believed to have a Weights and Measures Law similar to the Model Law. On the other hand, previous data had indicated that 33 States had adopted the Model State Packaging and Labeling Regulation, but this data proved that figure to be invalid.

* Alaska, Kentucky, Louisiana, Maryland, Mississippi, Rhode Island, South Dakota, Texas, Utah, Vermont, Virgin Islands, and Wyoming did not respond to the survey.

DATA SUMMARY—TOTAL RESPONSE 77.4%

I. Model Laws and Regulations

States that have adopted the:

Model State Weights and Measures Law	70.7%
Model State Packaging and Labeling Regulation	78%
Model State Method of Sale of Commodities Regulation	39%
Model State Unit Pricing Regulation	12.2%
Model State Registration of Servicemen and Service Agencies Regulation	51.2%
Model State Open Dating Regulation	9.8%
Model State Weighmaster Law	34.1%

II. NBS Handbook 44

States that hold public hearings for adoption of replacement sheets	26.8%
Earliest dates given to receive replacement sheets for January 1 enforcement	"August 15" and "As Soon As Possible"

III. Fees

States that charge for field inspection	31.7%
States that charge for laboratory calibrations	56.1%

IV. Registration of Servicemen

States that register servicemen or agencies	68.3%
States that have a voluntary registration system	39.0%
States that have a mandatory registration system	31.7%
States that have a licensing system	56.1%
States that license: Individual repairmen	39.0%
Agencies	31.7%
Individual devices	14.6%
States that require type approval	48.8%
States for which NBS Prototype Examination meets their requirements	79.3%

STATE, COUNTY AND CITY PROGRAM EVALUATION

It was once again called to the committee's attention during the interim meeting the need and great advantage that could accrue from the establishment of some type of program evaluation conducted by the National Conference on Weights and Measures. Items such as laws and regulations, physical standards (both lab-

oratory and field), program personnel, training at all levels, and measurement of performance should be given consideration during any such evaluation. The committee discussed this item at length during the interim meeting and received both input and support from industry and weights and measures officials. The committee recognized the benefits and completely endorses the development of such an evaluation program and recommends to the Conference that steps be taken through appropriate channels to develop and implement this program. The committee further recognizes that for such a program to be successful, it must be voluntary and be conducted by the National Conference as an "in-house" program.

The committee recommends at this time that the incoming Executive Committee appoint a task force to work with them in developing appropriate criteria for program evaluation. It is suggested that the task force members be appointed from active advisory and associate membership and should include members with present expertise and interest in the field. In recognition of the importance of and support received for this item, the committee fully expects with appropriate input from the task force to have complete guidelines in its tentative report to the 63rd National Conference.

USE OF FDA NRSTEN REPORTING SYSTEM

It has been called to the committee's attention that the Food and Drug Administration (FDA) has offered to cooperate with weights and measures officials in the reporting of short weight package violations of non-hydroscopic products and involving national distribution through use of their nationwide telecommunications system. This program would not be initiated until the publication of the new Handbook 67 since this would be the basis used in detecting violations. The committee endorses the principle set forth providing the information received by the State jurisdictions is transmitted to local officials.

CHANGES IN HANDBOOK 44 REPLACEMENT SHEETS

During his appearance before the committee at the interim meeting, Mr. Ellis Fitzgerald of Fairbanks Weighing Division of Colt Industries suggested that it would be extremely helpful to both weights and measures and industry officials to reference the Conference report that contained the reasons and background information for the specific changes to Handbook 44. Since it has been the practice in recent years to note at the end of each change or addi-

tion to H-44 the year the change was made, the reference to the Conference report could be included immediately following that reference; for example, [Amended 1976, 61st NC]. The committee agrees wholeheartedly with this suggestion and, therefore, requests that when replacement sheets are prepared for publication, this information be included.

ATTENDANCE BY OWM REPRESENTATIVES AT STATE AND REGIONAL CONFERENCES

The committee discussed at length the role and support of the Office of Weights and Measures to State and regional weights and measures associations. In reviewing the NBS Organic Act and the OWM Mission Statement, the committee feels that in furtherance of its objective to "cooperate with the States and their political subdivisions in the promotion of nationwide uniformity in commercial weighing and measuring," OWM should make every effort possible to have a representative in attendance at each State and regional association conference for the purpose of lending technical support to such associations.

W. B. Harper, *Chairperson*,
Birmingham, Alabama
W. H. Korth, Ventura County, California
A. J. Ladd, Akron, Ohio
S. Malone, Nebraska
S. Valtri, Philadelphia, Pennsylvania
R. N. Smith, *Staff Assistant*, NBS
H. F. Wollin, *Exec. Secy.*, NCWM

Committee on Education, Administration
on Consumer Affairs

(On motion of the committee chairman, the report of the Committee on Education, Administration, and Consumer Affairs was adopted in its entirety by the Conference by majority vote. The Conference also authorized the Executive Secretary to make any appropriate editorial changes in the language adopted by the Conference.)

REPORT OF THE COMMITTEE ON LIAISON WITH THE FEDERAL GOVERNMENT

Presented by E. H. Stadolnik, *Chairperson;*
Head Administrative Assistant for Division of Standards,
Executive Office of Consumer Affairs, State of Massachusetts.

(Thursday, July 21, 1977)

The Committee on Liaison with the Federal Government submits its final report to the 62nd 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 comments received during the year, a careful analysis of the interim meeting discussions, and oral presentations made during the open meeting of the committee.

WEIGHTS AND MEASURES PROGRAMS IN FEDERAL ESTABLISHMENTS

1. Military Installation Commissaries

Procedures as outlined in the 1976 Conference Report will remain the same. Organization structures of the Army, Navy, and Air Force will be published in the Tech Memo.

Thus far, the committee has not received any reports that indicate that there are any problems with the current practice.

2. U.S. Post Offices

The Committee on Specifications and Tolerances has indicated that it has reviewed the draft of the scale handbook submitted by the Postal Service. Recommendations were made for amendments to the draft and were accepted by the Postal Service. Several scale prototypes specifically designed for postal service have been submitted to the Office of Weights and Measures for evaluation. Examination indicated the need for modification of the prototype scales.

Because of an extensive reorganization in the Postal Service, representatives of that agency were not able to meet with the

committee. Contact will be maintained relative to this matter.

(The foregoing item was adopted by majority vote.)

INTERNATIONAL ORGANIZATION OF LEGAL METROLOGY

Discussions were held with David Edgerly, Special Assistant for International Standards Programs (National Bureau of Standards), concerning the NCWM procedure for review of the International Organization of Legal Metrology (OIML) documents. Mr. Edgerly indicated that it would be beneficial to formulate a procedure for directing OIML draft documents into NCWM in order to get an NCWM viewpoint.

A recommendation has been made to the National Measurement Policy and Coordination Committee (P&C) of a procedure for review of OIML documents. It is suggested that the United States (NBS) representative to OIML submit proposals to the chairman of P&C, the executive Secretary of the Conference and the NCWM representative on the Advisory Committee on OIML. The chairman of P&C and the executive secretary would then jointly assign such documents to the appropriate standing committee of the Conference. The standing committee shall then disseminate such proposals to the States and to associate members of NCWM for assistance in evaluating CIML documents. Upon completion of the evaluation, the results of the findings and the standing committee's recommendations shall be forwarded to the P&C chairman, the executive secretary and the NCWM representative on OIML and shall be made part of the standing committee report to NCWM.

(The foregoing item was adopted by majority vote.)

METRIC ACTIVITIES

Information has been requested concerning established State metric boards and others still in the formative stages. Interest has been expressed regarding the consolidation of information pertaining to such activity. A list of such boards and councils complete with names and addresses of their primary state contacts would be of value to Conference members. Mr. Jeff Odom, Metric Coordinator of the Office of Weights and Measures, NBS, in a memorandum to State weights and measure officials has offered to serve as a focal point for the reception and distribution of information pertaining to such activity. Some items of interest to be included in such communications are the chairman, board members, the scope

of the boards activities, and current activities and accomplishments.

It is requested that the State Directors send information to Mr. Odom concerning metric board activity in their jurisdictions. This information can be summarized in future publications of the Tech Memo or will be distributed in a separate metric newsletter to weights and measures officials. We recommend that all States share their experience in this undertaking. The Conference can become a valuable center of information concerning metric board activity.

It has been suggested that the committee take positive action to promote review and revision of State weights and measures laws and regulations to permit an orderly transition to metric. This should be a primary objective of the State metric boards. Mr. Odom has agreed to undertake a study of State regulations concerning their weights and measures laws and regulations and the metric transition.

(The foregoing item was adopted by majority vote.)

COMMUNICATION OF ISSUES BEFORE STANDING COMMITTEES

There have been complaints that many of the associate members are not aware of the items on the agenda of the standing committees at the interim meetings.

Specifically, the Associate Membership Committee (AMC) would like to have the opportunity to play a greater role, particularly at the interim standing committee meetings of the Conference. They feel that there is a need for expanded communication of issues presented to the standing committees and would like to receive proposals to be considered at the interim meetings. This is being done with the Scale Manufacturers Association, Meter Manufacturers Technical Committee, the Gasoline Pump Manufacturers Association, and the Industry Committee of Packaging and Labeling. However, to be of further assistance to those having interest in a specific proposal under consideration by a committee, a recommendation is made to the several standing committees to provide the chairman of the AMC with agenda information and he will see that it is circulated to the associate membership.

A request by the AMC for the prepublication draft of the standing committee interim meeting reports was rejected by the committee. The Conference announcement contains this information and is sent out to all associate members well in advance of the Conference.

(The foregoing item was adopted by majority vote.)

ENVIRONMENTAL PROTECTION AGENCY REQUIREMENTS

Petroleum product vendors and buyers report a conflict between weights and measures requirements concerning vehicle tanks used as measures and Environmental Protection Agency (EPA) regulations pertaining to hydrocarbon emissions. Specifically, the vendors have been reluctant to open tank domes for inspection claiming EPA regulations prohibit such inspections. Robert L. Ajax, Chief, Emission Measurement Branch, Emission Standards and Engineering Division, Environmental Protection Agency, Research Triangle Park, North Carolina in a talk at the 61st NCWM (1976) made the following statement to support the weights and measures officials contention that the tank domes may be opened for inspection before and after delivery:

> "EPA has published and distributed design criteria for Stage I control systems to the industry. The criteria are updated periodically as new information becomes available. Principal considerations are: drop-tube specifications, vapor hoses and connections, tank-truck inspection procedures, vent-line restrictions, and devices such as dry-break connections and interlocks, which assure that the vapor return hose is connected during tank filling. These criteria require a leak-tight truck; **however, they are not intended (and it is not our policy) to preclude the opening of hatch covers for inspection briefly before or after delivery."**

(The foregoing item was adopted by majority vote.)

GENERAL

The committee also prepared recommendations for the P&C Committee pertaining to the NCWM voting procedures, NCWM representation to OIML, and guidelines concerning the submission of proposals to the standing committees.

(The foregoing item was adopted by majority vote.)

E. H. Stadolnik, *Chairperson*, Massachusetts
C. H. Greene, New Mexico
O. D. Mullinax, Georgia
J. F. Speer, Milk Industry Foundation
S. Hasko, *Staff Assistant*, NBS
H. F. Wollin, *Exec. Secy.*, NCWM

Committee on Liaison with the Federal Government

(On motion of the committee chairperson, the report of the Committee on Liaison with the Federal Government was adopted in its entirety by the Conference by majority vote. The Conference also authorized the Executive Secretary to make any appropriate editorial changes in the language adopted by the Conference.)

REPORTS OF ANNUAL COMMITTEES

REPORT OF THE EXECUTIVE COMMITTEE

Presented by Earl Prideaux, Conference *Chairperson;*
Chief, Weights and Measures Section,
Department of Agriculture, State of Colorado

(Wednesday, July 20, 1977)

The Executive Committee submits its final report for consideration by the 62nd National Conference on Weights and Measures.

COMMITTEE NAME CHANGE

The Executive Committee recommends that the name of the NCWM Standing Committee, the "Committee on Liaison with the Federal Government," be changed to the "Committee on Liaison" to reflect the committee's deliberations and negotiations with organizations besides the Federal Government.

SIXTY-THIRD NCWM

Plans for the 63rd NCWM are:

Location:	**Washington, D.C.**
Hotel:	**Shoreham-Americana Hotel**
Dates:	**July 9-14, 1978**
Registration Fee:	**$50**

Plans for the interim meetings are:

Location:	**NBS, Gaithersburg, Maryland**
Dates:	**January 23-27, 1978**

SIXTY-FOURTH AND SIXTY-FIFTH NCWM

Tentative arrangements for 1979 and 1980 Conferences are:

1979—64th NCWM

Location:	**Portland, Oregon**
Dates:	**July 22-27, 1979**

1980—65th NCWM

Location:	**Washington, D.C.**
Dates:	**June 21-27, 1980**

In order to take advantage of the opportunity to meet with weights and measures officials from the other member nations of the International Organization of Legal Metrology (OIML), which has tentatively scheduled its Plenary Meeting in Washington, D.C., June 16-20, 1980, the committee recommends that the NCWM schedule its 65th Conference for June 21-27, 1980. It is important to make note of the fact to those attendees whose fiscal year begins July 1 of each year, that the 64th and 65th Conferences will occur in the same fiscal year. However, with proper planning and justification, the committee feels that this will not be an obstacle for anyone since there will be no NCWM in the following fiscal year. (The 66th NCWM will meet in July of 1981.) In order to assist the membership in its planning and justification, the National Bureau of Standards will address a letter to each State encouraging their participation in both the OIML and NCWM meetings. It is important to stress that this is a once-in-a-lifetime opportunity. The OIML meets in a general session of this type only every four years. The OIML conceivably will not meet again in the United States until after the turn of the century.

REPORT OF THE ASSOCIATE MEMBERSHIP COMMITTEE

Presented by Ray Wells, *Chairperson;*
Seraphin Test Measure Company

The Associate Membership Committee is pleased to report that plans are complete for the Associate Membership social event scheduled for Wednesday evening, July 20, 1977. There was a most generous participation by the firms solicited for contributions. A record number of contributors provided a record funding. We will remain solvent, with a small surplus to carry forward. The Associate Membership, on behalf of the sponsoring firms, welcomes this opportunity to provide a pleasant social interlude for the attendees of the Conference.

With regard to the broader and more general functions of the Associate Membership Committee, we wish to emphasize the availability of its members as a clearing house for matters of general import to industry and that the standing committees of the Conference utilize the committee as a source of industry input for consideration in matters under study.

The Executive Committee recognizes the vitally important role the Associate Membership Committee plays in the NCWM. The committee appreciates their support and participation in the Conference activities and encourages the standing committees to utilize the Associate Membership Committee as a source of industry input.

METRIC BOARD

The committee recommends that the next chairperson of the NCWM appeal to President Carter to establish the U.S. Metric Board. The committee also supports Sydney Andrews as the NCWM nominee to the Board as recommended by the P & C Committee.

NCWM VOTING PROCEDURES

The committee endorses the work of the National Measurement Policy and Coordination Committee and its continued study and clarification of the NCWM voting procedures.

E. Prideaux, *Chairperson*
T. F. Brink
G. E. Mattimoe
K. J. Simila
R. T. Williams
J. H. Akey
J. H. Lewis
H. W. Chandler
J. M. Chohamin
S. J. Darsey
L. D. Draghetti
R. C. Egnew
L. D. Holloway
V. L. Lowe
D. L. Lynch
C. W. Moore
H. F. Wollin, *Exec. Secy.*

Executive Committee

(On motion of the Conference Chairperson, seconded from the floor, the report of the Executive Committee was adopted in its entirety by the Conference by majority vote. The Conference also authorized the Executive Secretary to make any editorial changes in the language adopted by the Conference.)

REPORT OF THE COMMITTEE ON NOMINATIONS

Presented by RICHARD L. THOMPSON, *Chairperson;*
Chief, Weights and Measures Section, State of Maryland

(Thursday, July 21, 1977)

The Committee on Nominations met on Tuesday, July 19, for the purpose of selecting a slate of nominees for all elective offices and for the ten elective memberships of the Executive Committee. In the selection of nominees from the active membership, consideration was given to attendance records, geographical distribution, Conference participation, and other factors deemed by the committee to be important.

The Committee on Nominations submits the following names in nomination for office to serve during the ensuing year and at the 63rd National Conference on Weights and Measures:

Chairperson: James Lyles, State of Virginia

Vice Chairpersons:

1. Stan Darsey, State of Florida
2. Arvid Fenger, State of Minnesota
3. Lyman Holloway, State of Idaho
4. Donald Lynch, Kansas City, Kansas

Treasurer: James Akey, Wausau, Wisconsin

Chaplain: John Lewis, State of Washington

Executive Committee:

1. John Abbott, State of Missouri
2. Lacy DeGrange, State of Maryland
3. James Etzkorn, State of South Dakota
4. Charles Forester, State of Texas
5. David Griffith, State of West Virginia
6. Joseph Jones, Riverside County, California
7. Thomas Kirby, State of Georgia
8. Elvin Leeman, State of Wyoming
9. Webster McMurray, Tippecanoe County, Indiana
10. Casimir Mitalski, State of Illinois

R. L. Thompson, *Chairperson*, Maryland
S. D. Andrews, Florida
J. C. Boyd, Iowa
G. L. Johnson, Kentucky
J. H. Lewis, Washington
D. I. Offner, St. Louis, Missouri
E. Whitesides, Texas

Committee on Nominations

(There being no further nominations from the floor, nominations were declared closed, and the officers nominated by the committee were elected unanimously.)

REPORT OF THE COMMITTEE ON RESOLUTIONS

Presented by THOMAS E. KIRBY, *Chairperson;*
Director, Weights and Measures Laboratory, State of Georgia

(Thursday, July 21, 1977)

The Committee on Resolutions wishes to express the appreciation of the 62nd National Conference on Weights and Measures to each and every one who contributed their time and talents towards the arrangements for, the conduct of, and participation in this National Conference. A special vote of thanks goes to:

1. Mr. Robert S. Walleigh, Acting Deputy Director of the National Bureau of Standards, for his fine address.

2. Mr. Frank McLaughlin, Deputy Director of the Office of Consumer Affairs, for his timely remarks.

3. Mr. James A. Servin, Commissioner for Standards of South Australia, for his very informative address.

4. Honorable Reagan V. Brown, Commissioner of the Texas Department of Agriculture, for his participation in the program and his excellent presentation.

5. Honorable William F. Nicol, Councilman of the City of Dallas for his welcoming remark.

6. All speakers of the Conference for their expertise and contributions to the program.

7. All officers and appointed officials of the 62nd National Conference on Weights and Measures for their assistance and service towards a very successful Conference.

8. All committee members for their time and efforts throughout the past year to prepare and present their reports.

9. The governing officials of the State and local jurisdictions for their interest and support in weights and measures administration in the United States.

10. Representatives of business and industry for their cooperation and hospitality.

11. Consumer representatives, members of the public media, and other participants who have shown their interest and support for the National Conference on Weights and Measures.

12. The Conference host, City of Dallas, and the Dallas Department of Consumer Affairs for their hard work and countless hours devoted to insuring a successful Conference and extremely enjoyable visit to their city.

13. The Sheraton-Dallas Hotel for its fine facilities and courtesies which contributed to the enjoyment and comfort of the delegates.

14. To the National Bureau of Standards and the Office of Weights and Measures for planning and conducting the work and program of the National Conference on Weights and Measures.

The following resolutions are presented in their entirety for consideration by the members of the Conference:

A Resolution for Full Net Weight at Retail

WHEREAS: The founding fathers of our nation who recognized that many functions of government could best serve the people from the Federal level did also recognize the value in local government of providing protection against short weight and measure, and:

WHEREAS: Professional regulatory weight and measures personnel have provided the first line of defense in preventing short weights and measures in the marketplace throughout the years, and;

WHEREAS: Present rules from several Federal agencies are in conflict (USDA, FDA, FTC, and EPA), and such rules inhibit value comparisons and fair competition by not requiring full weight or measure at all levels of commerce, and:

WHEREAS: Any person in any community in our nation is fundamentally deserving of the right to expect to receive a pound of product when the label on the package he or she has purchased indicates that there is a pound in the package.

THEREFORE BE IT RESOLVED:

That the 62nd National Conference on Weights and Measures urges USDA, FDA, and FTC to take action by changing their rules so that the States may exercise their police power to assure the public that quantity labels are honest and that the weight or measure stated is accurate in all channels of trade, whether it be at the time of shipment or at the point of retail sale, and that a copy of this resolution be transmitted to the appropriate policymakers of each Federal agency.

A Resolution on the U.S. Metric Board

WHEREAS: Congress passed the U.S. Metric Act of 1975 which provides for the establishment of a U.S. Metric Board and for its consultation with the National Conference on Weights and Measures in the course of the nation's voluntary conversion to the metric system of units, and;

WHEREAS: In 1976, Mr. Sydney Andrews was supported by the National Conference on Weights and Measures and other standards organizations, as their choice for membership on the U.S. Metric Board, and;

WHEREAS: Mr. Andrews was chosen in 1976 by the White House to serve on the Metric Board, and;

WHEREAS: None of the nominees for the U.S. Metric Board had been confirmed at the time of the change of Executive Administration, and;

WHEREAS: The new Administration has not yet offered its nominations for the U.S. Metric Board.

THEREFORE BE IT RESOLVED:

That the 62nd National Conference on Weights and Measures by this resolution urges President Carter to nominate Mr. Sydney Andrews as the National Conference on Weights and Measures representative to the U.S. Metric Board. The Conference also urges the President to establish and convene the U.S. Metric Board as soon as possible so that the Board may go about the work of coordination, consultation, and guidance which the nation desperately requires in the change to metric.

A Resolution to Support S. 727

WHEREAS: The founding fathers of our nation who recognized that many functions of government could best serve the people from the Federal level did also recognize the value in local government of providing protection against short weight and measure, and;

WHEREAS: Professional regulatory weights and measures personnel have provided the first line of defense in preventing short weights and measures in the marketplace throughout the years, and;

WHEREAS: Present rules from several Federal agencies are in conflict (USDA, FDA, FTC, and EPA), and such rules inhibit value comparisons and fair competition by not requiring full weight or measure at all levels of commerce, and;

WHEREAS: Any person in any community in our nation is fundamentally deserving of the right to expect to receive a pound of product when the label on the package he or she has purchased indicates that there is a pound in the package.

THEREFORE BE IT RESOLVED:

That the 62nd National Conference on Weights and Measures urges support for S. 727 now under consideration before the Congress of the United States and any other legislation whose objective is to assure full weight or measure in all channels of trade and commends Senator Griffin of Michigan and Senator Cranston of California for their efforts to assure equity in the marketplace for industry and consumers of this nation.

T. E. Kirby, *Chairperson*, Georgia
J. C. Blackwood, Dallas, Texas
F. W. Daniels, Wayne County, Indiana
E. F. Delfino, California
A. Fenger, Minnesota
W. McMurray, Tippecanoe County, Indiana
J. J. White, New York, New York

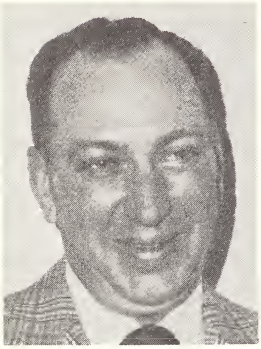
Committee on Resolutions

(On motion of the committee chairperson, seconded from the floor, the report of the Committee on Resolutions was adopted by majority vote.)

REPORT OF THE COMMITTEE ON AUDITING

Presented by KENNETH R. ADCOCK, *Chairperson;*
Chief, Division of Weights and Measures, State of Ohio

(Thursday, July 21, 1977)



The Auditing Committee met on Thursday morning, July 21, for the purpose of reviewing the financial records of the Conference treasurer, Mr. James H. Akey. The committee finds these records to be in accordance with Conference procedure and correct.

K. R. ADCOCK, *Chairperson;* Ohio
G. J. TOMMASI, Middletown, Connecticut
D. WEICK, Topeka, Kansas

Committee on Auditing

(On motion of the committee chairperson, seconded from the floor, the report of the Auditing Committee was adopted by majority vote.)

REPORT OF THE TREASURER

Presented by JAMES H. AKEY, *Treasurer*
Sealer of Weights and Measures, Wausau, Wisconsin

(Thursday, July 21, 1977)

Balance on hand July 1, 1976		$ 4,518.42
RECEIPTS:		
Registration, 396 @ $50.00	$19,800.00	
Tickets for NBS Luncheon	70.00	
	$19,870.00	
		$24,388.42
DISBURSEMENTS:		
Louis R. Kengla, Banner	$ 431.25	
Atwood Transportation Lines, Inc.	288.00	
Harold Wollin, Registration Desk and Operating Exp.	748.95	
Shoreham Americana Hotel, Master Account	2,578.22	
Baltimore & Annapolis Railroad Company	1,300.50	
Gunston Hall Plantation, Ladies	411.35	
Government Services, Incorporated	1,801.21	
Brewood, Engraving & Printing	148.42	
Howard Devron, Orchestra	935.00	
Gratuity to Speaker (Cash)	50.00	
Bank Charge	3.00	
	$ 8,695.90	

Balance on hand September 23, 1976		$15,692.52
Medallion Balance July 1, 1976		$ 6,489.61
Income	$ 182.50	
		182.50
Medallion Balance September 23, 1976		$ 6,672.11
Conference Balance September 23, 1976		15,692.52
		$22,364.63

Depository, Bank of Indiana

(Signed) C. C. Morgan, *Treasurer*

Editors Note: Mr. Morgan transferred the Conference Treasurer's records and funds to Mr. Akey on his retirement

Received from Cleo C. Morgan, September 27, 1976		$22,364.63
Deposit—General Account	$15,692.52	
Deposit—Medallion Account	6,672.11	
		$22,364.63
General Account balance on hand, September 27, 1976		$15,692.52

RECEIPTS:

NSF Check replaced	$ 50.00	
Room rebate—interim meetings	141.70	
	$ 191.70	
		$15,884.22

DISBURSEMENTS:

James L. Lyles, OIML travel	$ 300.00
Franklin Press, Letterheads & envelopes	48.15
Postage for voting procedure mailing	26.00
Bank deposit stamp	2.85
Earl Prideaux, Southern Conference expenses	343.50
Charge for printing checks	3.91
Government Services, Inc., Interim luncheons	82.94
OWM, Interim meeting expenses	323.94
Earl Prideaux, Chairman, Expenses	477.95
S & T Committee	1,701.21
L & R Committee	1,766.67

Education, Administration & Consumer Affairs	1,698.16	
Liaison Committee	963.19	
National Measurement Policy Committee	603.65	
Stamps	13.00	
James F. Lyles, OIML travel balance	127.51	
Earl Prideaux, California Conference expenses	336.75	
Award Company of America, Plaques	23.25	
Franklin Press, Treasurer's receipts	60.58	
	$ 8,903.21	
General Account balance on hand, July 1, 1977		$ 6,981.01
Medallion Account balance on hand, September 27, 1976		$ 6,672.11
RECEIPTS:		
Sale of Decals	$ 30.00	
Sale of Medallions	107.50	
"Whatta Family" Sales	171.29	
	$ 308.79	
		$ 6,980.90
DISBURSEMENTS:		
NBS, Weights & Measures Film		$ 7,000.00
Medallion Account balance on hand, July 1, 1977		$ (19.10)
General Account balance on hand, July 1, 1977		6,981.01
Net balance on hand, July 1, 1977		$ 6,961.91

Depository, First Wisconsin National Bank of Wausau

(Signed) James H. Akey, *Treasurer*

(On motion of the Treasurer, seconded from the floor, the Report of the Treasurer was adopted by the Conference.)

CONFERENCE REGISTRATION LIST

State, City, and County Weights and Measures Officials

ALABAMA

State ---------- JOHN B. RABB, Laboratory Supervisor, Weights and Measures, Department of Agriculture and Industries, 1445 Federal Drive, P.O. Box 3336, Montgomery 36109 (Tel. 205:832-3750)

City:

Birmingham 35203 ------- W. B. HARPER, Chief, Weights and Measures, City Hall, Room 207 (Tel. 205:254-2246)

ARIZONA

State ---------- RAYMOND H. HELMICK, Chief, Weights and Measures, 3039 West Indian School Road, Phoenix 85017 (Tel. 602:271-5211)

ARKANSAS

State ---------- SAM F. HINDSMAN, Director, Weights and Measures, 4608 West 61st Street, Little Rock 72209 (Tel. 501:371-1759)
ED HOLIMAN, Assistant Director
BILLY W. SULLIVANT, Laboratory Supervisor

CALIFORNIA

State ---------- ALLAN J. GOODMAN, Deputy Attorney General, State of California, 555 Capitol Mall, Suite 350, Sacramento 95814 (Tel. 916:445-9369)
EZIO F. DELFINO, Chief, Division of Measurement Standards, Department of Food and Agriculture, 8500 Fruitridge Road, Sacramento 95826 (Tel. 916:445-7001)
DARRELL GUENSLER, Assistant Chief
RICHARD STARN, Supervisor

County:

Alameda ---------- PATRICK E. NICHOLS, Director, Weights and Measures, 333 Fifth Street, Oakland 94607 (Tel. 415:874-6736)

Butte ---------- JOHN W. HOUGHTON, Director, Weights and Measures and President of California Association of Weights and Measures Officials, 196 Memorial Way, Chico 95926 (Tel. 916: 343-4211, ext. 78)

Kern	VERNON L. LOWE, Director, Weights and Measures, 1116 East California Avenue, Bakersfield 93307 (Tel. 805:861-2418)
Los Angeles	W. R. MOSSBERG, Director, Weights and Measures, 11012 Garfield Avenue, South Gate 90280 (Tel. 213:862-4261)
Orange	WILLIAM FITCHEN, Sealer, Weights and Measures, 1010 South Harbor Boulevard, Anaheim 92805 (Tel. 714:774-0284)
Riverside	JOSEPH W. JONES, Director, Weights and Measures, 2950 Washington, Riverside 92504 (Tel: 714:787-2620)
San Bernardino	H. E. SANDEL, Director, Weights and Measures and Consumer Affairs, 160 East Sixth Street, San Bernardino 92415 (Tel. 714:383-1411)
San Mateo	H. EUGENE SMITH, Director, Weights and Measures, 702 Chestnut Street, Redwood City 94063 (Tel. 415:364-5600)
Santa Clara	DANIEL R. SMITH, Director, Consumer Affairs, 1555 Berger Drive, San Jose 95112 (Tel. 408:299-2105)
Sutter	MELVIN L. MCELROY, Director, Weights and Measures, Consumer Affairs, 142 Garden Highway, Yuba City 95991 (Tel. 916:674-0430)
Ventura	WILLIAM H. KORTH, Director, Weights and Measures, 608 El Rio Drive, Oxnard 93030 (Tel. 805:487-7711)
Yolo	HERBERT CHANDLER, Director, Weights and Measures, P.O. Box 175, Woodland 95695 (Tel. 916:666-8261)
Yuba	JACK A. HUEY, Director, Weights and Measures, 921 West Fourteenth Street, Marysville 95901 (Tel. 916:674-6376)

COLORADO

State	EARL PRIDEAUX, Chief, Weights and Measures Section, 3125 Wyandot, Denver 80211 (Tel. 303:892-2845) MILTON D. SCHNEIDER, Chief, Oil Inspection Section, Division of Labor, 888 East Iliff Avenue, Denver 80210 (Tel. 303:892-2096)

CONNECTICUT

State — JOHN T. BENNETT, Chief, Weights and Measures, Department of Consumer Protection, State Office Building, Room G-17, Hartford 06115 (Tel. 203:566-4778)
JOHN T. NICOSIA, Inspector, Weights and Measures, and President of Connecticut Weights and Measures Association, 173 Park Avenue, Derby 06418 (Tel. 203:734-6213)

City:
Hartford 06114 — JOHN MOKRYCKI, Sealer, Weights and Measures, 550 Main Street (Tel. 203:566-6457)

Middletown 06457 — GUY J. TOMMASI, Sealer, Weights and Measures, City Hall (Tel. 203:347-4671)

DELAWARE

State — EUGENE KEELEY, Supervisor, Weights and Measures, Drawer D, Dover 19901 (Tel. 302:678-4824)

FLORIDA

State — SYDNEY D. ANDREWS, Director, Division of Standards, Department of Agriculture and Consumer Services, Mayo Building, Laboratory Complex, Tallahassee 32304 (Tel. 904: 488-0645)
COUNCIL WOOTEN, Chief, Bureau of Weights and Measures (Tel. 904:488-9140)
STAN J. DARSEY, Assistant Chief

County:
Dade — JOHN C. MAYS, Director, Consumer Protection Division, 140 West Flagler Street, 16th Floor, Miami 33130 (Tel. 305:579-4222)

City:
Sunrise 33313 — MELVIN SILVERMAN, Supervisor, Weights and Measures, 1277 Sunset Strip (Tel. 305: 587-5024)

GEORGIA

State — O. D. MULLINAX, Assistant Commissioner, Fuel and Measures Division, Department of Agriculture, Capitol Square, Atlanta 30334 (Tel. 404:656-3605)
THOMAS E. KIRBY, Director, Weights and Measures Laboratory, Atlanta Farmers Market, Forest Park 30050 (Tel. 404:363-7611)

John J. Peacock, Chief, Fuel Oil Section, Agriculture Building, Room 327, Capitol Square, Atlanta 30334 (Tel. 404:656-7057)

HAWAII

State ---------- George E. Mattimoe, Deputy Director, Division of Measurement Standards, Department of Agriculture, P.O. Box 22159, Honolulu 96822 (Tel. 808:941-3071)

C. Gerald Bockus, Supervising Metrologist, Division of Measurement Standards, P.O. Box 226, Captain Cook 96704 (Tel. 808: 323-2608)

IDAHO

State ---------- Lyman D. Holloway, Chief, Weights and Measures, Department of Agriculture, 2216 Kellogg Lane, Boise 83702 (Tel. 208:384-2345)

ILLINOIS

State ---------- Murvil D. Harpster, Chief, Bureau of Products Inspection and Standards, Emmerson Building, State Fairgrounds, Springfield 62706 (Tel. 217:782-3817)

Sidney A. Colbrook, Quantity Standards Technician

Dave Marsh, Methods and Procedures Advisor I

Casimir Mitalski, Quantity Standards Technician, 535 East Sangamon Avenue (Tel. 217:782-7655)

City:

Chicago 60602 ---------- Terry A. Hocin, Deputy Commissioner, Department of Consumer Sales, Weights and Measures, 121 North LaSalle Street, City Hall, Room 808 (Tel. 312:744-4007)

Theodore R. Heller, Consumer Service Supervisor (Tel. 312:744-4092)

Edward Margoscin, Chief Consumer Service Supervisor (Tel. 312:744-4008)

INDIANA

State ---------- M. Morris Thompson, Assistant Director, Weights and Measures, 1330 West Michigan, Indianapolis 46206 (Tel. 317:633-0350)

County:

Bartholomew	WILLIAM L. WEDDLE, Inspector, Weights and Measures, Courthouse, Room B-3, Columbus 47201 (Tel. 812:376-8641)
Clark	ROBERT W. WALKER, Inspector, Weights and Measures, City-County Building, Room 314, Jeffersonville 47130 (Tel. 812:283-4451)
Floyd	JAMES M. MOREILLON, Inspector, Weights and Measures, 627 East Fourth Street, New Albany 47150 (Tel. 812:944-1677)
Gibson	WILLIAM R. SEVIER, Inspector, Weights and Measures, Court House Annex, Somerville 47683 (Tel. 812:795-2532)
Johnson	WAYNE E. HANDY, Inspector, Weights and Measures, County Courthouse, Franklin 46131 (Tel. 317:736-5774)
Lake	ALBERT M. MYSOGLAND, Sealer, Weights and Measures, 2293 North Main, Crown Point 46307 (Tel. 219:738-2020, ext. 301 or 302)
Laporte	EDWIN M. HANISH, Inspector, Weights and Measures, 2702 Franklin Street, Michigan City 46360 (Tel. 219:874-7197)
Madison	CHARLES W. MOORE, Inspector, Weights and Measures, County Government Center, Anderson 46016 (Tel. 317:646-9359)
Porter	RICHARD H. CLAUSSEN, Inspector, Weights and Measures, 1401 North Calumet, Room 501, Valparaiso 46383 (Tel. 219:464-4722)
St. Joseph	CHESTER S. ZMUDZINSKI, Inspector, Weights and Measures, 227 West Jefferson Boulevard, County-City Building, South Bend 46601 (Tel. 219:284-9751)
Tippecanoe	WEBSTER MCMURRY, Inspector, Weights and Measures, Court House, P.O. Box 444, LaFayette 47902 (Tel. 317:742-0626)
Vigo	ROBERT J. SILCOCK, Inspector, Weights and Measures, Court House, Room 5, Terre Haute 47807 (Tel. 812:232-5746)
Wabash	HAROLD G. SMITH, Inspector, Weights and Measures, Court House, Wabash 46992
Wayne	FRANCIS W. DANIELS, Administrator, Weights and Measures, 50 North Fifth, Richmond 47374 (Tel. 317:935-4813)

City:

Anderson 46011 ---------- EARL GADBERRY, Inspector, Weights and Measures, P.O. Box 2100 (Tel. 317:646-5814)

East Chicago 46312 ------ THAD A. BOGUSZ, Sealer, Weights and Measures, 4713 Northcote Avenue (Tel. 219: 397-0073)

Gary 46407 ---------- JOHN NASTAV, Acting Sealer, Weights and Measures, 1100 Massachusetts Street (Tel. 312:944-6567)

Hammond 46320 --------- DEAN BRAHOS, Sealer, Weights and Measures, 5925 Calumet Avenue, City Hall, Room 315 (Tel. 219:853-6377)

Indianapolis 46204 ------- FRANK L. BRUGH, Administrator, Weights and Measures, City-County Building, Room G6 (Tel. 317:633-3733)
RUSSELL BROWN, Deputy Inspector
HARRY RICHARDS, Deputy Inspector
GARY RUPPERT, Deputy Inspector

Mishakawa 46544 -------- GEORGE STAFFELDT, Inspector, Weights and Measures, City Hall (Tel. 219:255-2281)

South Bend 46621 -------- BERT S. CICHOWICZ, Sealer, Weights and Measures, Municipal Services Facility (Tel. 219: 284-9273)

IOWA

State ---------- J. CLAIR BOYD, Supervisor, Standard Control, Weights and Measures Division, Department of Agriculture, State Capitol Building, Des Moines 50319 (Tel. 515:281-5716)

KANSAS

State ---------- JOHN L. O'NEILL, State Sealer, Weights and Measures, State Board of Agriculture, 503 Kansas Avenue, Topeka 66603 (Tel. 913: 296-3846)

City:

Kansas City 66101 -------- DONALD L. LYNCH, Director, Weights and Measures, 701 North Seventh Street (Tel. 913:371-2000, ext. 440)

Topeka 66603 ---------- DONALD J. WEICK, Chief Inspector, Weights and Measures, 215 East Seventh (Tel. 913: 295-3883)

KENTUCKY

State ..... George L. Johnson, Director, Weights and Measures, 106 West Second Street, Frankfort 40601 (Tel. 502:564-4870)
Ronald C. Egnew, Laboratory Supervisor

City:
Louisville 40202 ..... James Oslin, Supervisor, Weights and Measures, 701 West Jefferson (Tel. 502:587-3595)

LOUISIANA

State ..... Ronald R. Harrell, Administrator, Weights and Measures, Department of Agriculture, P.O. Box 44456, Baton Rouge 70441 (Tel. 504:389-7087)

MAINE

State ..... Gaylon M. Kennedy, Deputy State Sealer, Weights and Measures, Department of Agriculture, State House, Augusta 04333 (Tel. 207:289-3841)
Marshall M. White, Metrologist (Tel. 207:289-2752)

MARYLAND

State ..... Richard L. Thompson, Chief, Weights and Measures, Department of Agriculture, University of Maryland, Symons Hall, Room 3205, College Park 20742 (Tel. 301:454-3551)

MASSACHUSETTS

State ..... Edward H. Stadolnik, Head Administrative Assistant, Division of Standards, One Ashburton Place, Executive Office of Consumer Affairs, Room 1115, Boston 02108 (Tel. 617:727-3480)

City:
Agawam 01001 ..... Louis D. Draghetti, Inspector, Weights and Measures, 36 Main Street (Tel. 413:786-0400)

Cambridge 02139 ..... Robert K. Laffin, Sealer, Weights and Measures, City Hall, Room 211-B (Tel. 617:876-6800, ext. 251)

Plymouth 02360 ..... David Montanari, Sealer, Weights and Measures, 35 Davis Street (Tel. 617:747-1620)

West Springfield 01089 --- PAUL T. GAMELLI, Inspector, Weights and Measures, 26 Central Street (Tel. 413:781-7550)

MICHIGAN

State ---------- E. C. HEFFRON, Chief, Food Inspection Division, Lewis Cass Building, Fifth Floor, Lansing 48913 (Tel. 517:373-1060)
LAWRENCE MARTIN GOLDIN, Inspector, Food Inspection Division, 42210 Parkside Circle, Sterling Heights 48078 (Tel. 313:739-2136)
RAYMOND HANKEY, Inspector, Food Inspection Division, 124 River Park Drive, Marshall 49068 (Tel. 616:781-3448)

MINNESOTA

State ---------- WARREN E. CZAIA, Inspector, Weights and Measures, Department of Public Service, 1015 Currie Avenue, Minneapolis 55403 (Tel. 615:333-3249)
ARVID W. FENGER, Senior Inspector

City:
Minneapolis 55415 ------- JOHN BERGQUIST, Assistant Director, Licenses, Consumer Services, City Hall, Room 105 (Tel. 612:348-2080)

MISSISSIPPI

State ---------- BRUCE BRYANT, Director, Consumer Protection Division, Walter Sillers Building, P.O. Box 1609, Jackson 39205 (Tel. 601:354-6258)

MISSOURI

State ---------- J. W. ABBOTT, Director, Weights and Measures, P.O. Box 630, Jefferson City 65101 (Tel. 314:751-4278)

City:
St. Louis 63112 ---------- DANIEL I. OFFNER, Commissioner, Weights and Measures, 1220 Carr Lane Avenue, Room 145 (Tel. 314:453-3251)

MONTANA

State ---------- GARY DELANO, Administrator, Weights and Measures, 805 North Main, Helena 59601 (Tel. 406:449-3163)

NEBRASKA

State ..... STEVEN A. MALONE, Administrator, Weights and Measures, P.O. Box 94757, Lincoln 68509 (Tel. 402:471-2875)

City:

Omaha 68102 ..... NORMAN M. ROSS, Chief, Weights and Measures, Omaha-Douglas Civic Center (Tel. 402:444-5368)

NEW JERSEY

State ..... JAMES R. BIRD, Deputy State Superintendent, Weights and Measures, 187 West Hanover Street, Trenton 08625 (Tel. 609:292-4615)
BERNARD D. ARCKIVY, Metrologist

County:

Camden ..... A. J. FRANCESCONI, Superintendent, Weights and Measures, Court House, Room 306, Camden 08101 (Tel. 609:757-8196)

Cape May ..... A. DAVID GIDDING, Superintendent, Weights and Measures, 6807 Seaview Avenue, Wildwood Crest 08260 (Tel. 609:522-4861)

Cumberland ..... GEORGE S. FRANKS, Superintendent, Weights and Measures, 788 East Commerce Street, Bridgeton 08302 (Tel. 609:451-8000, ext. 296)

Gloucester ..... ROBERT J. MORRIS, Superintendent, Weights and Measures, County Building, 49 Wood Street, Woodbury 08096 (Tel. 609:845-1600, ext. 252)
JOSEPH SILVESTRO, Assistant Superintendent

Middlesex ..... JOHN M. CHOHAMIN, Superintendent, Weights and Measures, 841 Georges Road, North Brunswick 08902 (Tel. 201:246-6298)

Monmouth ..... WILLIAM I. THOMPSON, Superintendent, Weights and Measures, Hall of Records, Freehold 07728 (Tel. 201:531-7363)

Salem ..... ROBERT B. JONES, Superintendent, Weights and Measures, P.O. Box 24, Salem 08079 (Tel. 609:935-3152)

Somerset ..... CHESTER J. LEONOWICZ, Assistant Superintendent, Weights and Measures, Administration Building, Somerville 08876 (Tel. 201:725-4700, ext. 268)

City:

Nutley 07110 ..... WILBUR TALBOT, Superintendent, Weights and Measures, Public Safety Building (Tel. 201:667-2800)

NEW MEXICO

State ---------- CHARLES H. GREENE, Chief, Division of Consumer and Marketing Services, P.O. Box 3170, Las Cruces 88003 (Tel. 505:646-1616)
FRED A. GERK, Associate Chief
RICHARD F. SCHULMEISTER, Metrologist
ELMER L. BUTLER, Inspector
MIKE R. STEFFEY, Inspector

NEW YORK

State ---------- JOHN J. BARTFAI, Director, Weights and Measures, Building 7-A, State Campus, Albany 12235 (Tel. 518:457-3452)

County:
Monroe ---------- LOUIS P. ROMANO, Sealer, Weights and Measures, 1157 Scottsville Road, Rochester 14624 (Tel. 716:436-1330)

City:
New York City 10013 ---- JAMES J. WHITE, Deputy Commissioner, Department of Consumer Affairs, 80 Lafayette Street, Room 306 (Tel. 212:566-5007)

NORTH CAROLINA

State ---------- MARION L. KINLAW, Director, Consumer Standards Division, Department of Agriculture, P.O. Box 26056, Raleigh 47611 (Tel. 919:733-3313)
TOM W. SCOTT, Chief, Measurement Section.
DURWARD TAYLOR, Area Supervisor

OHIO

State ---------- KENNETH R. ADCOCK, Chief, Division of Weights and Measures, 8995 East Main, Reynoldsburg 43068 (Tel. 614:866-6361)

County:
Clark ---------- JAMES S. POWERS, SR., Inspector, Weights and Measures, County Auditor's Office, County Building, Box 1325, Springfield 45502 (Tel. 513:324-5871)

Cuyahoga ---------- FRANK KOSITS, JR., Supervisor, Weights and Measures, 1219 Ontario Street, Cleveland 44113 (Tel. 216:623-7035)

City:
Akron 44306 ---------- ANTHONY J. LADD, Superintendent, Weights and Measures, 1420 Triplett Boulevard (Tel. 216:375-2878)
CHARLES S. PULLIUM, Assistant Superintendent

Dayton 45402 ..... LEON MILLER, Sealer, Weights and Measures, 960 Ottawa Street (Tel. 513:225-5304)

OKLAHOMA

State ..... H. K. SHARP, Assistant Director, Marketing Division, Department of Agriculture, 122 Capitol Building, Oklahoma City 73105 (Tel. 405:521-3861)
H. H. LATHAM, Supervisor, Regulatory Section
KENNETH FRALEY, Metrologist
R. D. SCHRICK, Chief Inspector

OREGON

State ..... KENDRICK J. SIMILA, Administrator, Weights and Measures, Agriculture Building, Salem 97310 (Tel. 503:378-3792)

PENNSYLVANIA

State ..... WALTER F. JUNKINS, Director, Bureau of Standard Weights and Measures, 2301 North Cameron Street, Harrisburg 17120 (Tel. 717: 787-6772)

City:

Allentown 18102 ..... ARNOLD L. HEILMAN, JR., Sealer, Weights and Measures, 302 Gordon Street (Tel. 215: 437-7770)

Philadelphia 19107 ..... SAM F. VALTRI, Chief, Weights and Measures, 801 Arch Street, Room 636 (Tel. 215:686-3475 or 3476)

PUERTO RICO

State ..... MARIA A. MALDONADO GARCIA, Assistant Secretary, Department of Consumer Affairs, P.O. Box 41059 Minillas Station, Santurce 00940 (Tel. 809:726-7585)

RHODE ISLAND

State ..... EDWARD R. FISHER, Administrator, Weights and Measures, 470 Allens Avenue, Providence 02905 (Tel. 401:277-2758)

SOUTH CAROLINA

State ..... E. W. BALLENTINE, Director, Consumer Services, Department of Agriculture, P.O. Box 11280, Columbia 29211 (Tel. 803:758-2426)

Charles T. Smith, Director, Consumer Protection Division
John V. Pugh, Director, Metrology Division (Tel. 803:758-2130)

SOUTH DAKOTA

State ---------- James A. Etzkorn, Supervisor, Weights and Measures, State Capitol Building, Pierre 57501 (Tel. 605:224-4452)

TENNESSEE

State ---------- Robert M. Reeves, Acting Director, Weights and Measures, P.O. Box 40627, Nashville 37204 (Tel. 615:741-1413)
Robert G. Williams, Laboratory Technologist (Tel. 615:741-1539)

TEXAS

State ---------- Reagan V. Brown, Commissioner, State Department of Agriculture, P.O. Box 12847, Austin 78711 (Tel. 512:475-6346)
Ed Whitesides, Director, Rural Urban Business Standards Division (Tel. 512:475-4304)
Charles E. Forester, Supervisor, Weights and Measures (Tel. 512:475-6577)
Bill Dill, Inspector (Tel. 512:475-4304)
Sam D. Smith, Supervisor, Metrology Laboratories, 115 San Jacinto, Austin 78701 (Tel. 512:475-3720)
James H. Eskew, Chief Metrologist
J. Louis Aguilar, Inspector, 3105 Leopard, Corpus Christi 78408 (Tel. 512:883-5708)
Enrique Arriola, Inspector, 9513 Album, El Paso 79925 (Tel. 915:598-9732)
Norman J. Butts, District Supervisor, 421 East Ferguson, Tyler 75710 (Tel. 214:597-6571)
James P. Hallmark, Assistant Supervisor
Randle L. Clarkson, Inspector
Robert R. Champion, District Supervisor, P.O. Box 690, Pharr 78577 (Tel. 512:787-8866)
Ray L. Cure, Regional Administrator, 4619 Insurance Lane, Dallas 75205 (Tel. 214:528-9936)
Newell Ballard, District Supervisor
Billy Rivers, Inspector
E. W. Wesley, Inspector
Wayne O. Cure, Supervisor, 1017 Cimarron, Odessa 79761 (Tel. 915:332-5131)

David L. Davis, Inspector, 200 East Third, Apt. 412, Big Spring 79720 (Tel. 915:267-5551)

Dan Dibrell, District Supervisor, 123 Auditorium Circle, San Antonio 78229 (Tel. 512: 223-4251)

Earl A. Berger, Inspector, Large Capacity Scales

Travis J. Edwards, Regional Supervisor, 4900 Fannin, Houston 77004 (Tel. 713:526-5900 and 5901)

Clyde B. Starns, District Supervisor

James O. Whitmire, Assistant Supervisor

Gregory G. Maldonado, Chief Inspector

Barry J. Williams, Inspector

Z. D. Garcia, Jr., Inspector, 1800 Ceneisa, Alice 78332 (Tel. 512:664-0728)

Raymond Houtchens, District Supervisor, 2004 Fourth Street, Lubbock 79415 (Tel. 806:747-1656)

John B. Singleton, III, Inspector

Jimmy Taylor, Inspector

Robert T. McDaniel, District Supervisor, 3905 Sunburst, Beaumont 77706 (Tel. 713: 898-1674)

Martha L. McDermott, District Inspector, 916 Avenue M, Huntsville 77340 (Tel. 713: 295-0545)

Clemon Montgomery, Regional Administrator, P.O. Box 1962, Austin 78767 (Tel. 512: 475-6389)

Doland Olson, Supervisor, 100 North University Drive, Room 272, Forth Worth 76107 (Tel. 817:335-7992)

Tom B. Cantrell, Assistant Supervisor

Herbert Rampley, Scale Inspector

Haven Snow, Scale Inspector

Billy B. Quicksall, Chief Inspector, 123 Auditorium Circle, San Antonio 78229 (Tel. 512: 223-4251)

Jimmy Reynolds, Inspector, P.O. Box 98, Eustace 75124 (Tel. 214:425-3161)

Dick A. Watkins, Inspector, P.O. Box 6, Warren 77664 (Tel. 713:547-2274)

O. O. Williamson, Inspector, 2501 East Mistletoe, Victoria 77901 (Tel. 512:575-6772)

Arnold Winkelmann, Supervisor, P.O. Box 612, Brenham 77833 (Tel. 713:836-5641)

William L. Calcote, Inspector

Ralph M. Latimer, Inspector

City:

Dallas 75201 ---------- Charles H. Vincent, Director, Department of Consumer Affairs, 2014 Main Street, City Hall (Tel. 214:744-1133)

F. G. YARBROUGH, Assistant Director
JAMES C. BLACKWOOD, Supervisor, Weights and Measures, 1500 West Mockingbird, Room 408 (Tel. 214:630-1111, ext. 421)
JOHN WALKER, Metrologist, City Hall (Tel. 214:748-9711)
FAYE COLLINS, Inspector
JIMMY COTTEN, Inspector
ROBERT HERMANSON, Inspector
KATHY MCALISTER, Inspector
H. E. PRESCOTT, Inspector
R. L. SHARP, Inspector
B. J. SMITH, Investigator, Technical Division

Fort Worth 76107 ..... FRED R. CORRADO, Sealer, 1800 University Drive (Tel. 817:335-7211, ext. 200)
MASON G. RICI, Sealer
J. DAVID WATSON, Sealer, 1000 Throckmorton, Fort Worth 76101

UTAH

State ..... FRED D. MORGAN, Superintendent, Weights and Measures, 5757 South 320 West Street, Murray 84103 (Tel. 801:533-5459)

VERMONT

State ..... TRAFFORD F. BRINK, Director, Weights and Measures, 116 State Street, Montpelier 05602 (Tel. 802:828-2436)

VIRGIN ISLANDS

State ..... DORENE E. CARTER, Director, Consumer Services Administration, Golden Rock Shopping Center, Christiansted, St. Croix 00820 (Tel. 809:773-2226)

VIRGINIA

State ..... J. F. LYLES, Supervisor, Weights and Measures, One North 14th Street, Room 032, Richmond 23219 (Tel. 804:786-2476)
OSCAR T. ALMARODE, Field Supervisor

WASHINGTON

State ..... JOHN H. LEWIS, Chief, Weights and Measures, General Administration Building, Room 406, Olympia 98504 (Tel. 206:753-5059)

WEST VIRGINIA

State ---------- DAVID L. GRIFFITH, Director, Consumer Protection Division, Department of Labor, 1900 Washington Street, East, Charleston 25305 (Tel. 304:348-7890)

MACK H. COMBS, Assistant Director, Room B-445

WISCONSIN

State ---------- ROBERT PROBST, Director, Bureau of Standards, 801 West Badger Road, Madison 53713 (Tel. 608:266-7241)

NEIL F. GILBERTSON, Field Supervisor (Tel. 608:266-7244)

City:

Green Bay 54301 ---------- J. KENNETH LIEBERT, Sealer, Weights and Measures, City Hall, Room 308 (Tel. 414: 497-3665)

Wausau 54401 ---------- JAMES H. AKEY, Sealer, Weights and Measures, 407 Grant Street (Tel. 715:845-5279)

West Allis 53214 ---------- JOHN A. LUPO, Specialist, Weights and Measures, 7220 West National Avenue (Tel. 414: 476-3770)

WYOMING

State ---------- ELVIN R. LEEMAN, Standards Calibration Specialist, Weights and Measures, 2219 Carey Avenue, Cheyenne 82001 (Tel. 307:777-7321)

MANUFACTURERS, INDUSTRY, AND BUSINESS

A-B&W Sales Company

JAY J. BUSEY, Partner, P.O. Box 12363, Houston, Texas 77017 (Tel. 713: 644-7027)

TOMMY WHEELESS, Partner

Accurate Metering Systems, Inc.

CLARENCE DREIER, President, 1731 Carmen Drive, Elk Grove Village, Illinois 60007 (Tel. 312:640-0670)

Acme Scale & Supply Company

RAY C. CANFIELD, President, 5427 Butler Street, Pittsburgh, Pennsylvania 15201 (Tel. 412:782-1808)

American Can Company

DR. F. J. VERMILLION, Director, Quality Control, American Lane, Greenwich, Connecticut 06830 (Tel. 203:552-2374)

American Frozen Food Institute

MICHAEL BROWN, Vice President, Government Relations, 919 Eighteenth Street, N.W., #700, Washington, D.C. 20006 (Tel. 202:296-4080)

American Meat Institute
CHESTER ADAMS, Vice President and General Counsel, P.O. Box 3556, Washington, D.C. 20007 (Tel. 703:841-1030, ext. 270)
American National Metric Council
MICHAEL THOMPSON, Program Administrator, 1625 Massachusetts Avenue, N.W., Washington, D.C. 20036 (Tel. 202:232-4525)
American Petroleum Institute
RICHARD SOUTHERS, Manager, Operations and Engineering, 2101 L Street, N.W., Washington, D.C. 20037 (Tel. 202:457-7014)
WILLIAM A. KERLIN, Special Representative
Amstar Corporation
WALTER J. ZIELNICKI, Quality Control Coordinator, 1251 Avenue of the Americas, New York, New York 10020 (Tel. 212:489-9000)
Analogic Corporation
ROBERT H. STURDY, Senior Vice President, Audubon Road, Wakefield, Mass. 01880 (Tel. 617:246-0300)
GUY WILSON, Product Sales Manager
Argo Taximeters
G. RICHARD WYCKOFF, Special Sales Representative, 36-21 Thirty-Third Street, Long Island City, New York 11106 (Tel. 212:937-4600)
Armour Food Company
GARY F. TURPIN, Manager, Quality Control, Greyhound Tower, Phoenix, Arizona 85077 (Tel. 602:248-5404)
Association of American Railroads
J. J. ROBINSON, Executive Director, O-T Division, 1920 L Street, N.W., Washington, D.C. 20036 (Tel. 202:293-4144)
Atlantic Richfield Company
RICHARD J. CUNNINGHAM, Construction and Maintenance Engineer, 515 South Flower Street, Los Angeles, California 90071 (Tel. 213:486-2283)

Bennett Pump Company
JOHN P. HAUET, Manager, Field Service, P.O. Box 597, Muskegon, Michigan 49443 (Tel. 616:733-1302)
Berkel Incorporated
WILLIAM N. SHANNON, III, Corporate Vice President, One Berkel Drive, LaPorte, Indiana 46350 (Tel. 219:326-7000)
Brinkmann Instruments, Inc.
DIETER SCHLUTER, Sales Manager, Sartorius Balance Division, Cantiague Road, Westbury, New York 11590 (Tel. 516:334-7500)
Brooks Instrument Division
BARRIE L. BLOSER, Manager, Product Development, P.O. Box 450, Statesboro, Georgia 30458 (Tel. 912:764-5471)

California Film Extruders and Converters Association
CARL L. TIMMONS, Sales Manager, 18901 Railroad Street, City of Industry, California 91748 (Tel. 213:912-1557)
Cardinal Scale Manufacturing Company
TERRY JAMES, Vice President, Engineering, P.O. Box 151, Webb City, Missouri 64870 (Tel. 417:674-4631)
The Chessie System, Inc.
EMIL SZAKS, Director, Structural Design, P.O. Box 1800, Huntington, West Virginia 25718 (Tel. 304:522-5740)
Cities Service Oil Company
WILLIAM H. RICHMAN, Manager, Engineering and Construction, P.O. Box 300, Tulsa, Oklahoma 74102 (Tel. 918:586-2668)

The Coca-Cola Company
ROBERT A. LESTER, Attorney, Box Drawer 1734, Atlanta, Georgia 30301 (Tel. 404:897-2530)
A. LEE TURNER, Public Affairs Department (Tel. 404:897-2623)
Colgate-Palmolive
E. E. WOLSKI, Manager, Quality Control, 300 Park Avenue, New York, New York 10022 (Tel. 212:751-1200, ext. 6131)
Cox Scale Company
BOB T. COX, Manager, P.O. Box 451, Lee's Summit, Missouri 64063 (Tel. 816:524-1419)
CPC International, Inc.
HANES A. HELLER, Corporate Counsel, Englewood Cliffs, New Jersey 07632 (Tel. 201:894-2381)
Crown Zellerbach Corporation
FRED C. CHACE, Manager, Planning, Converted Products, No. 1 Bush Street, San Francisco, California 94118 (Tel. 415:823-5568)

Dairypak
BERT W. TAYLOR, Manager, Packaging Development, P.O. Box 9245, Cleveland, Ohio 43085 (Tel. 216:235-4040)
Datacon, Inc.
PAUL E. BERNARD, Project Engineer, 1202 Avenue J East, Grand Prairie, Texas 75050 (Tel. 214:647-1116)
MIKE SIMS, Engineer, P.O. Box 5647, Arlington, Texas 76011 (Tel. 214: 647-1116)
Dee, J. B., Company, Inc.
GENE FISHMAN, President, 1722 West 16th Street, Indianapolis, Indiana 46202 (Tel. 317:635-5548)
MILES DEE FISHMAN, Vice President
Diamond International Corporation
LIANE F. WAITE, Director, Home Economics and Consumer Affairs, 733 Third Avenue, New York, New York 10017 (Tel. 212:697-1700, ext. 571)
DOVER CORPORATION/OPW Division
WILLIAM J. BROWN, Sales Manager, P.O. Box 40240, Cincinnati, Ohio 45240 (Tel. 513:870-3222)
Dresser Industries
WARREN J. DUBSKY, Chief, Fuel Dispensing Products, Petroleum Equipment Division, 124 West College Avenue, Salisbury, Maryland 21801 (Tel. 301:749-6161)
Dunbar Manufacturing, Inc.
HARVEY M. LODGE, Vice President, Sales, 307 Broadway, Swanton, Ohio 43558 (Tel. 419:244-3021)

Electroscale Corporation
JOSEPH F. GEISSER, Eastern Regional Sales Manager, Tingley Lane, North Providence, Rhode Island 02904 (Tel. 401:728-0044)
Exxon Chemical Company, U.S.A.
J. R. CHENOWETH, Engineering Coordinator, P.O. Box 2180, Houston, Texas 77001 (Tel. 713:656-2936)
JOSEPH R. MURPHY, Product Sales Manager, P.O. Box 3272 (Tel. 713: 656-0178)
FRANK T. MAHON, Consumer Products Supervisor, 67 Walnut Avenue, Clark, New Jersey 07066 (Tel. 201:474-3261)

Fairbanks Weighing Division/Colt Industries
KENNETH F. HAMMER, President, 711 East St. Johnsbury Road, St. Johnsbury, Vermont 05819 (Tel. 802:748-5111, ext. 300)
ELLIS FITZGERALD, Manager, Engineering Services
RICHARD L. WHIPPLE, Manager, Technical Services
CLAUDE PRICE, Manager, Operations, 2934 Fleetbrook Drive, Memphis, Tenn. 38116 (Tel. 901:332-8002)
Federal-State Reports, Inc.
JANE S. WILSON, President, 2201 Wilson Boulevard, Arlington, Virginia 22101 (Tel. 703:522-5100)
U.S. Fiber Corporation
TOM MILLER, Technical Director, 101 South Main, Delphos, Ohio 45833 (Tel. 419:692-7015)
JOE TYLER, Sales Manager
Fluid Measurement Systems, Inc.
D. J. HINE, Manager, Eastern Division, P.O. Box 587, Martinsburg, West Virginia 25401 (Tel. 304:263-6357)
Food Marketing Institute
DENNIS M. DEVANEY, Counsel, 1750 K Street, Suite 700, Washington, D.C. 20006 (Tel. 202:452-8444)

Gasoline Pump Manufacturers Association
ROBERT M. BYRNE, Technical Director, 331 Madison Avenue, New York, New York 10017 (Tel. 212:661-2050)
General Electrodynamics Corporation
A. T. TIMM, Sales Manager, Scale Products, 4430 Forest Lane, Garland, Texas 75040 (Tel. 214:276-1116, ext. 218)
General Foods Corporation
CHARLES P. ORR, Quality Assurance Consultant, 250 North Street, White Plaines, New York 10625 (Tel. 914:683-4073)
General Host Corporation
MORRIS Y. KINNE, Western Regional Counsel, 100 West Clarendon, Phoenix, Arizona 85013 (Tel. 602:264-4242)
General Mills, Inc.
DONALD B. COLPITTS, Technical Manager, Weights and Measures, 9000 Plymouth Avenue, North, Minneapolis, Minnesota 55427 (Tel. 612:540-2729)
WILLIAM C. MAILHOT, Director, Quality Control, 9200 Wayzata Boulevard, Minneapolis, Minnesota 55426 (Tel. 612:540-2354)
NEAL D. PETERSON, Attorney, 1730 M Street, N.W., Room 907, Washington, D.C. 20036 (Tel. 202:296-0360)
Georgia-Pacific Corporation
NORMAN H. DOYLE, Quality Control, 800 Summer Street, Stamford, Connecticut 06901 (Tel. 203:327-1100)
George Weston Limited
A. R. CHADSEY, Director, Packaging Services, 22 St. Clair Avenue East, Toronto, Ontario, Canada M4T 2S5 (Tel. 416:961-3666)
Gerber Products Company
LYLE LITTLEFIELD, Government Relations Manager, 445 State Street, Fremont, Michigan 49412 (Tel. 616:928-2264)
Getty Refining and Marketing Company
W. C. GROSSHAUSER, P.O. Box 1650, 1437 South Boulder, Tulsa, Oklahoma 74102 (Tel. 918:584-2311)

ARNE A. LAISI, Senior Staff Engineer, 6600 Madison Avenue, New York, New York 10021 (Tel. 212:832-7800)

Gilbarco, Inc.

GEORGE D. ROBINSON, JR., Manager, Mechanical Engineering, 7300 Friendly Road, Greensboro, North Carolina 27420 (Tel. 919:292-3011)

JOHN N. HASTINGS, Assistant to the Manager, Mechanical Engineering

CLAUDE R. PARENT, Manager, Special Accounts, 344 Village Square, Orinda, California 94563 (Tel. 415:254-1011)

Glass Packaging Institute

GEORGE TEITELBAUM, Director, Glass Technology and Design, 1800 K Street, N.W., Washington, D.C. 20006 (Tel. 202:812-1280)

Greyhound-Armour

ROBERT E. WILMOTH, Assistant General Counsel, 111 West Clarendon, Phoenix, Arizona 85077 (Tel. 602:946-3220)

Grocery Manufacturers of America, Inc.

MAHLON A. BURNETTE, III, Director, Scientific Affairs, 1425 K Street, N.W., Suite 900, Washington, D.C. 20005 (Tel. 202:638-6100)

Gulf Oil Company, U.S.A.

GEORGE R. DAVIS, Manager, Facilities and Distribution, P.O. Box 22808, Dallas, Texas 75222 (Tel. 214:387-4530)

Harris, R. F., and Associates

RICHARD F. HARRIS, President, 1225 East Windsor, Phoenix, Arizona 85006 (Tel. 602:264-0392)

Heart of Texas Scales

JOHN J. CHINNI, President and General Manager, P.O. Box 7975, Waco, Texas 76710 (Tel. 817:675-8355)

EDWARD J. WEAVER, Vice President

Heinz, H. J., Company

JOHN S. ELLIOTT, Senior Manager, Government Regulations Department, P.O. Box 57, Pittsburgh, Pennsylvania 15230 (Tel. 412:237-5862)

Helena Rubinstein

HERBERT E. SCHNEIDER, Director, Quality Control, Northern Boulevard, Greenvale, New York 11548 (Tel. 516:484-5400, ext. 305 and 315)

Hobart Corporation

KENNETH C. ALLEN, Consultant, P.O. Box 1690, Dayton, Ohio 45401 (Tel. 513:254-8451)

EDWIN E. BOSHINSKI, Director, Dayton Research Division, 1555 Stanley Avenue, Dayton, Ohio 45404 (Tel. 513:223-0452)

FRED KATTERHEINRICH, Manager, Weights and Measures, World Headquarters, Troy, Ohio 45374 (Tel. 513:254-3516)

Hormel, George A. & Company

BRYON M. CRIPPIN, JR., General Counsel, P.O. Box 800, Austin, Minnesota 55912 (Tel. 507:437-5671)

Howe Richardson Scale Company

GEORGE D. WILKINSON, Vice President, Service, 680 Van Houten Avenue, Wayne, New Jersey 07015 (Tel. 201:471-3400)

JOSEPH H. CAVALIERE, Regional Service Manager, P.O. Box 307, Broadview, Illinois 60153 (Tel. 312:345-7605)

Hunt-Wesson Foods

CLIFFORD KLOOS, Group Leader, Research and Development, 1645 West Valencia, Fullerton, California 92634 (Tel. 714:871-2100)

Interface, Inc.
R. F. Caris, President, 7401 East Butherus, Scottsdale, Arizona 85260 (Tel. 602:948-5555)

Jewel Companies, Inc.
Ralph W. Miller, Jr., Vice President, Regulatory Research and Planning, and General Counsel, Jewel Food Stores Division, 1955 West North Avenue, Melrose Park, Illinois 60160 (Tel. 312:531-6103)
Johnson and Johnson
John E. Friend, Assistant Manager, Regulatory Affairs, 501 George Street, New Brunswick, New Jersey 08901 (Tel. 201:524-5034)

Kraft, Incorporated
J. Edward Thompson, Senior Attorney, Kraft Court, Glenview, Illinois 60025 (Tel. 312:998-2486)
The Kroger Company
David P. Leahy, Technical Consultant, 1240 State Avenue, Cincinnati, Ohio 45204 (Tel. 513:921-5300, ext. 461 and 473)

Landvater Associates
John H. Landvater, President, P.O. Box 654, Summit, New Jersey 07901 (Tel. 201:273-8757)
Liberty Glass Company
E. Kenneth Mills, Consultant, P.O. Box 520, 317 East Lee Street, Sapulpa, Oklahoma 74066 (Tel. 918:224-1440)
Lipton, Thomas J., Inc.
Lawrence E. Hicks, Associate General Counsel, 800 Sylvan Avenue, Englewood Cliffs, New Jersey 07632 (Tel. 201:567-8000)
Robert J. Hlavacek, Assistant Vice President, Quality Assurance
Liquid Controls Corporation
Howard Siebold, Consultant, P.O. Box 784, Fort Bragg, California 95437 (Tel. 707:964-4171)
Lockheed Missiles and Space Company
Mario R. Carrara, Supervisor, Precision Tool and Gage Laboratory, P.O. Box 504, Sunnyvale, California 94086 (Tel. 408:743-0217)

Martin Decker Company
Fred M. Conley, Administrative Manager, 1928 South Grand Avenue, Santa Ana, California 92705 (Tel. 714:540-9220)
William H. Garner, Industrial Sales Manager
William R. Neilson
E. I. Shelley, District Sales Manager
The Measuregraph Company
Eric Allen, Technical Service Manager, 4245 Forest Park Boulevard, St. Louis, Missouri 63108 (Tel. 314:533-7800)
Metro Equipment Corporation
Robert B. Gardner, Sales Manager, P.O. Box 60037, Sunnyvale, California 94088 (Tel. 408:734-5400)
Metrodyne Corporation
Sal Barbera, Vice President, 20 Acosta Street, Stamford, Connecticut 06902 (Tel. 203:348-9255)
Milk Industry Foundation
John F. Speer, Jr., Executive Assistant, 910 17th Street, N.W., Washington, D.C. 20006 (Tel. 202:296-4250)

Millers' National Freedom
JOHN J. SHERLOCK, Vice President, 1776 F Street, N.W., Washington, D.C. 20006 (Tel. 202:452-0900)
Mobay Chemical Corporation
LOWELL SCHETTLER, Technical Specialist—Consultant, 224 South Lewis Street, Columbus, Wisconsin 53924 (Tel. 414:623-3333)
FRED J. ZAGANIACZ, Market Development Representative, Penn Lincoln Parkway West, Pittsburgh, Pennsylvania 15205 (Tel. 412:923-2700, ext. 213)
Mobil Oil Corporation
J. A. PETRELLI, Manager, Marketing Operations Engineering, 150 East 42nd Street, New York, New York 10017 (Tel. 212:883-5204)
Mobil Chemical Company
BOB WISEMAN, Quality Assurance Supervisor, Technical Center, Macedon, New York 14502 (Tel. 315:986-6419)
Mono-Therm Industries
WESLEY N. EDMUNDS, Counsel, 3000 Sea-First Building, Seattle, Washington 98154 (Tel. 206:682-3333)
Morris Scale Company
CLIFFORD V. MORRIS, President, 1537 Southeast Morrison Street, P.O. Box 14306, Portland, Oregon 97214 (Tel. 503:232-5339)
Murphy-Cardinal Scale Company
WILLIAM V. GOODPASTER, Vice President, 1610 North C Street, Sacramento, California 95814 (Tel. 916:441-0178)

National Cash Register Corporation
A. R. DANIELS, Manager, Industry and Government Relations, CHQ, Fourth Floor, Dayton, Ohio 45479 (Tel. 513:449-2454)
National Cellulose Insulation Manufacturers Association, Inc.
L. A. BARRON, Managing Director, 220 Seegers Avenue, Elk Grove Village, Illinois 60007 (Tel. 312:439-0888)
National Consumers Congress
DANIEL MCCURRY, Midwest Regional Director, 5516 South Cornell, Chicago, Illinois 60637 (Tel. 312:955-0197)
National Controls, Inc.
ROBERT J. BACHERT, Sale Administrator, 1160 Hopper Avenue, Santa Rosa, California 95401 (Tel. 707:527-5555)
National Flexible Packaging Association
E. C. MERKLE, Executive Vice President, 12025 Shaker Boulevard, Cleveland, Ohio 44120 (Tel. 216:229-6373)
National Hardwood Lumber Association
E. HOWARD GATEWOOD, Secretary-Manager, 332 South Michigan Avenue, Chicago, Illinois 60604 (Tel. 312:427-2810)
ROBERT E. HOLLOWELL, Former President (See Pierson-Hollowell Company)
National Oil Jobbers Council
BURTON L. WELLER, Staff Engineer, 1750 New York Avenue, N.W., Washington, D.C. 20006 (Tel. 202:331-1198)
National Scale Men's Association
SYLVIA T. PICKELL, Executive Secretary and Treasurer, 214½ South Washington Street, Naperville, Illinois 60540 (Tel. 312:355-4788)
Neptune Measurement Company
EMMETT F. WEHMANN, Assistant Chief Engineer, P.O. Box 792, Emerald Road, Greenwood, South Carolina 29646 (Tel. 803:223-0062)

New Brunswick International, Inc.
NORMAN WOLFF, Technical Consultant, Five Greek Lane, Edison, New Jersey 08817 (Tel. 201:287-2288)
Nicol Scales, Inc.
WILLIAM F. NICOL, President, P.O. Box 22288, Dallas, Texas 75222

Ormond, Incorporated
ROGER R. THORN, Treasurer, 11969 East Rivera Road, Santa Fe Springs, California 90670 (Tel. 213:689-0641 or 723-3646)

P.C.M. Company Ltd.
MIKE ENTEZARI, Managing Editor, P.O. Box 14-1497, Tehran, Iran (Tel. 290-392)
Phillips Petroleum Company
HAL M. FAULCONER, Engineering Consultant, 511 TRW Building, Bartlesville, Oklahoma 74004 (Tel. 918:661-6334)
Pierson-Hollowell Company
ROBERT E. HOLLOWELL, President, 630 North College Avenue, Indianapolis, Indiana 46204 (Tel. 317:632-5537)
The Pillsbury Company
CARL A. TAUBERT, Manager, Safety and Regulatory Compliance, 608 Second Avenue, South, Minneapolis, Minnesota 55402 (Tel. 612:330-4332)
Pitney Bowes
RUTHERFORD H. FENN, Director, Corporate Standards, Stamford, Connecticut 06904 (Tel. 203:356-6148)
Plastics, Incorporated
J. L. FORMO, Vice President, Research and Development, P.O. Box 3610, St. Paul, Minnesota 55165 (Tel. 612:227-7371)
Powerline Oil Company
PAUL SAMSING, Retail Sales Manager, 12354 Lakeland Road, Santa Fe Springs, California 90670 (Tel. 213:944-6111)
Presto Products, Inc.
BARRY GLASHAGEL, Director, New Product Development, P.O. Box 2399, Appleton, Wisconsin 54911 (Tel. 414:739-9471)
FRANK H. HECKRODT, Chief Operating Officer
MARVIN LAMBERT, Director, Quality Control
TONY ZELLER, Director, Packaging
Procter and Gamble Company
WILLIAM H. BRAUN, Section Head, 6100 Center Hill Road, Cincinnati, Ohio 45224 (Tel. 513:977-8233)
JOHN P. SIEGFRIED, Counsel, Legal Division, P.O. Box 599, Cincinnati, Ohio 45201 (Tel. 513:562-4400)
TERRY THOMAS, Section Head, Ivorydale Technical Center, Cincinnati, Ohio 45217 (Tel. 513:562-5183)

The Quaker Oats Company
FRED A. DOBBINS, Director, Quality Assurance-Compliance, 617 West Main Street, Barrington, Illinois 60010 (Tel. 312:381-1980, ext. 248)

Revere Corporation of America
JOHN J. ELENGO, JR., Vice President, Engineering, 845 North Colony Road, Wallingford, Connecticut 06492 (Tel. 203:269-7701, ext. 332)
BRUCE D. ERBE, National Service Manager

Bruce A. Murphy, Vice President, Marketing

RF Products Corporation

John A. Callahan, President, 2441-H McAllister, Houston, Texas 77092 (Tel. 713:686-8445)

Riviana Foods, Inc.

Gary J. Steen, Manager, Quality Assurance, P.O. Box 2636, Houston, Texas 77001 (Tel. 713:529-3251)

Safeway Stores, Inc.

Harry N. Couden, Manager, Food Technology Division, Fourth and Jackson Streets, Oakland, California 94660 (Tel. 415:891-3253)

Robert L. Winslow, Manager, Quality Assurance Department (Tel. 415: 891-3250)

Sanitary Scale Company

Edward Karp, Vice President, 910 East Lincoln Avenue, Belvidere, Illinois 61008 (Tel. 815:544-2181)

John Farwell, General Sales Manager

Scale Manufacturers Association

Raymond J. Lloyd, Executive Director, 1000 Vermont Avenue, N.W., Washington, D.C. 20005 (Tel. 202:628-4634)

Daryl E. Tonini, Technical Director

Seraphin Test Measure Company

Raymond R. Wells, Vice President, 30 Indel Avenue, Rancocas, New Jersey 08073 (Tel. 609:267-0922)

Shell Oil Company

Adin H. Hall, Senior Staff Engineer, P.O. Box 3105, Houston, Texas 77001 (Tel. 713:241-6558)

C. L. Van Inwagen, Staff Engineer, P.O. Box 2105 (Tel. 713:220-6973)

Single Service Institute

Thomas W. LaCascia, Director, General Services, 250 Park Avenue, New York, New York 10017 (Tel. 212:697-4545)

Soap and Detergent Association

Mary P. Kilcoyne, Director, Legislative and Regulatory Information, 475 Park Avenue, South, New York, New York 10016 (Tel. 212:725-1262)

Southern Weighing and Inspection Bureau

C. E. Pike, Manager, 151 Ellis Street, N.E., Suite 306, Atlanta, Georgia 30303 (Tel. 404:659-6266, ext. 266)

Martin R. Gruber, Jr., Supervisor of Weights

Smith Meter Systems Division/Geosource, Inc.

Philip E. Swanson, Product Engineer, 1602 Wagner Avenue, Erie, Pennsylvania 16511 (Tel. 814:899-0661)

Spinks Scale Company, Inc.

Deane F. Laird, President, 836 Stewart Avenue, S.W., Atlanta, Georgia 30310 (Tel. 404:758-0744)

Sweda International

H. Warren Gross, Applications Specialist, 34 Maple Avenue, Pine Brook, New Jersey 07058 (Tel. 201:575-8106)

Texas Instruments

E. James Tew, Jr., Manager, QRA Operations, P.O. Box 6015 MS415, Dallas, Texas 75222 (Tel. 214:238-4175)

Thatcher Glass Manufacturing Company

William N. Arduser, Staff Project Engineer, P.O. Box 265, Elmira, New York 14902 (Tel. 607:737-3194)

Thermtron Products, Inc.
BRIAN C. DERBYSHIRE, Technical Service Manager, Box 9146 Baer Field, Fort Wayne, Indiana 46809 (Tel. 219:747-9183)
Thurman Scale Company
JOSEPH R. SCHAEFFER, Vice President, 1939 Refugee Road, Columbus, Ohio 43215 (Tel. 614:443-9741)
Tokheim Corporation
WALTER F. GERDOM, Manager, Technical Services, 1602 Wabash Avenue, Fort Wayne, Indiana 46801 (Tel. 219:423-2552)
Toledo Scale Division/Reliance Electric Company
LEW SCHWERING, Regional Manager, 8208 Capwell Drive, Oakland, California 94621 (Tel. 415:636-0148)
THOMAS M. STABLER, Manager, Weights and Measures, P.O. Box 1705, Columbus, Ohio 43216 (Tel. 614:438-4548)
J. DONALD ZELAZNY, Marketing Manager (Tel. 614:438-4545)
Transducers, Incorporated
HOWARD NIELSEN, Vice President, Marketing, 12140 East Rivera Road, Whittier, California 90606 (Tel. 213:945-3741)
JAMES R. STORY, Regional Sales Manager
JOSEPH JOHN SURGENOR, Marketing Specialist

Union Carbide
R. W. WOLFE, Director of Technology, 55 Haul Road, Wayne, New Jersey 07470 (Tel. 201:694-8800)
Union Oil Company
W. J. MYERS, Manager, Marketing Equipment, 1650 East Golf Road, Schaumburg, Illinois 60196 (Tel. 312:885-5144)

Veeder Root Company
ALFRED C. EVANS, Director of Engineering, 70 Sargeant Street, Hartford, Connecticut 06102 (Tel. 203:527-7201)
ROBERT E. NIX, Manager, Distributor Services
T. J. MCLAUGHLIN, Regional Manager, 1049 Grand Central, Glendale, California 91201 (Tel. 213:245-0161)
CARL SANDERS, Regional Manager

Weigh Tronix, Inc.
RICHARD S. BRADLEY, Executive Vice President, P.O. Box 928, Fairmont, Minnesota 50631 (Tel. 507:238-4461)
Wilson's, William M., Sons, Inc.
CHARLES J. DENNY, Manager, Customer and Technical Services, Eighth Street and Valley Forge Road, Lansdale, Pennsylvania 19446 (Tel. 215: 855-4631)

Yankee Milk, Inc.
MORGAN D. BEACH, Weights and Measures Supervisor, Newington, Connecticut 06098 (Tel. 203:379-4454)

UNITED STATES GOVERNMENT

Department of Agriculture
Packers and Stockyards Administration:
CHARLES H. OAKLEY, Chief, Scales and Weighing Branch, 14th and Independence Avenue, Washington, D.C. 20250 (Tel. 202:447-3140)

Ben D. Baird, Scales and Weighing Specialist, 167 North Main Street, Federal Building, Room 459, Memphis, Tennessee 38103 (Tel. 901: 521-3414)

Jimmy W. Thompson, Scales and Weighing Specialist, 819 Taylor Street, Room 8A36, Fort Worth, Texas 76102 (Tel. 817:334-3286)

Deane Wilson, Scales and Weighing Specialist

Federal Grain Inspection Service:

Dr. Leland E. Bartelt, Administrator, South Building, Room 1628, Washington, D.C. 20250 (Tel. 202:447-9170)

Dr. William H. Dubbert, Chief Staff Officer, Systems Development and Sanitation Staff, Technical Services, Meat and Poultry, Room 2165 (Tel. 202:447-3840)

George T. Lipscomb, Acting Director, Weighing Division, 201 14th Street, S.W., Auditor's Building, Room 3117 (Tel. 202:447-4852)

Richard R. Pforr, Scale Specialist (Tel. 202:447-6173)

Raymond Lavine, Agricultural Commodity Grader, 2320 LaBranch, Houston, Texas 77033 (Tel. 713:226-4321)

Carl Sorenson, Regional Information Officer, 1100 Commerce Street, Room 5C40, Dallas, Texas 75242 (Tel. 214:749-3331)

Federal Trade Commission

Earl W. Johnson, Attorney, Sixth and Pennsylvania Avenue, N.W., Washington, D.C. 20580 (Tel. 202:724-1143)

Food and Drug Administration

Charles H. Pogue, Consumer Safety Officer, 5600 Fishers Lane, Rockville, Maryland 20857 (Tel. 301:443-6200)

Charles W. Sedgwick, Compliance Officer, 3032 Bryan Street, Dallas, Texas 75204 (Tel. 214:749-2737)

Office of Consumer Affairs

Frank E. McLaughlin, Acting Director, 621 Reporters Building, Washington, D.C. 20201 (Tel. 202:755-8875)

National Bureau of Standards

Robert S. Walleigh, Acting Deputy Director

Allen J. Farrar, Legal Advisor

Brian Belanger, Acting Chief, Office of Measurement Services

Bernard J. McGuire, Jr., Product Standards Development Section

Chock I. Siu, Physicist, Thermal Engineering Section

Albert D. Tholen, Deputy Chief, Standards Application and Analysis Division

Phyllis J. Williams, International Standards Assistant, Office of International Standards

Office of Weights and Measures

Harold F. Wollin, Chief, Executive Secretary of National Conference on Weights and Measures

Carroll S. Brickenkamp, Manager, Research and Development
Stephen Hasko, Engineer
Harry K. Johnson, Engineering Technician
Jeffrey V. Odom, Metric Coordinator
Richard N. Smith, Technical Coordinator
Terrance N. Troy, Manager, Consumer Laws and Regulations
Otto K. Warnlof, Manager, Technical Services
Patricia A. Raschella, Secretary
Deborah A. Neal, Secretary
Gail M. Lennon, Secretary

OTHER REGISTRANTS

Doug Adams, Reporter, KXAS-TV, 555 Griffin Square, Dallas, Texas 75202

John Armstrong, Chief, Weights and Measures, Standards Branch, Tunney's Pasture, Ottawa, Ontario, Canada (Tel. 613:992-4895)

William S. Bussey, retired, former Associate Director for Weights and Measures Administration, NBS, 1511 West 29th Street, Austin, Texas 78703 (Tel. 512:476-1740)

Edward Norman Eden, Head of Metrology, Quality Assurance and Standards Division, Department of Prices and Consumer Protection, Abell House, John Islip Street, London SW1P 4LN, England (Tel. 01-211 3634)

Erik Repstorff Holtveg, Director, National Bureau of Weights and Measures, Amager Boulevard 115, DK 2300 Copenhagen S, Denmark (Tel. XX-45 1-272620)

Edward H. Ilcken, President, Texas Metric Council, P.O. Box 3135, College Station, Texas 77840

Cleo C. Morgan, Advisory Member, former Sealer of Weights and Measures, City of Gary, Indiana, 441 Connecticut Street, Gary, Indiana 46402 (Tel. 219:883-5380)

Joyce Rubash, Metric Coordinator, National Association of College and University Food Services, Rice University, P.O. Box 1892, Houston, Texas 77001 (Tel. 713:527-8101)

James A. Servin, Commissioner for Standards, Standards Branch, Department of Public and Consumer Affairs, 8 West Thebarton Road, Thebarton, South Australia 5031 (Tel. 227 2432)

Geoffrey Souch, Head, Legal Metrology Branch, United Kingdom Department of Prices and Consumer Protection, 26 Chapter Street, London, England SW1P 4NS (Tel. 01-834-7032, ext. 7)

Walter H. Staple, Regional Supervisor, Weights and Measures, Consumer and Corporate Affairs, 480 University Avenue, Toronto, Ontario, Canada M5G 1V2 (Tel. 416:598-4011)

Frederick G. Taylor, Consultant, 509 Beardsley Avenue, Bloomfield, New Jersey 07003 (Tel. 201:748-4294)

Maximiliano Trujillo, Attorney, P.O. Box 40317, Santurce, Puerto Rico 00940 (Tel. 809:751-7742)

WEIGHTS AND MEASURES PUBLICATIONS

The following publications may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. *Remittance must accompany order.*

NBS Handbook 44, Fourth Edition—Specifications, Tolerances, and Other Technical Requirements for Commercial Weighing and Measuring Devices.
SN003-003-00894-0 ..... $7.90

NBS Handbook 117—Examination of Vapor-Measuring Devices for Liquefied Petroleum Gas
SN003-003-01563-6 ..... .75

Reports of the National Conference on Weights and Measures:

NBS Special Publication 377—Index to the Reports of the National Conference on Weights and Measures (1905-1971)
SN003-003-01107-0 ..... .85

NBS Special Publication 391—Report of 58th Conference (1973)
SN003-003-01260-2 ..... 2.50

NBS Special Publication 407—Report of 59th Conference (1974)
SN003-003-01379-0 ..... 3.75

NBS Special Publication 442—Report of 60th Conference (1975)
SN003-003-01614-4 ..... 3.30

NBS Special Publication 471—Report of 61st Conference (1976)
SN003-003-01806-6 ..... 3.75

NBS Special Publication 304—Metric Chart
SN003-003-01072-3 ..... .65

NBS Special Publication 304A—Brief History of Measurement Systems
SN003-003-01713-2 ..... .35

NBS Special Publication 330—The International System of Units (SI) (1977 Edition)
SN003-003-01784-1 ..... 1.60

NBS Special Publication 345—A Metric America—A Decision Whose Time Has Come
SN003-003-00884-2 ..... 2.70

The following publications may be obtained from the National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22151. *Remittance must accompany order.* The prices listed are for paper copies.

NBS Handbook 94—The Examination of Weighing Equipment
(COM No. 73-10635) $9.25

NBS Handbook 98—The Examination of Farm Milk Tanks
(COM No. 72-10619) 4.00

NBS Handbook 99—The Examination of Liquefied Petroleum Gas Liquid-Measuring Devices
(Order by Handbook No.) 4.00

NBS Handbook 105-1—Specifications and Tolerances for Field Standard Weights
(COM No. 72-50707) 3.50

NBS Handbook 105-2—Specification and Tolerances for Field Measuring Flasks (COM No. 71-50065) ---------- 3.50

NBS Handbook 447—Weights and Measures Standards of the United States, A Brief History (COM No. 71-50252) ---------- 1.00

NBS Circular 593—The Federal Basis for Weights and Measures (COM No. 75-10234) ---------- 4.00

The following publications may be obtained from the Office of Weights and Measures, National Bureau of Standards, Washington, D.C. 20234. *Remittance must accompany order.*

NBS Handbook 82—Weights and Measures Administration ---------- 1.75

NBS Handbook 112—Examination Procedure Outlines for Commercial Weighing and Measuring Devices ---------- 1.70

No Charge for the following publications:

Mission of the Office of Weights and Measures

National Conference on Weights and Measures—Its Organization and Procedure

Model State Weights and Measures Law

Model State Weighmaster Law

Model State Packaging and Labeling Regulation

Model State Method of Sale of Commodities Regulation

Model Unit Pricing Regulation

Model State Registration of Servicemen and Service Agencies Regulation

Model State Open Dating Regulation

List of State, Commonwealth, District, and Local Weights and Measures Offices of the United States

NBS Special Publication 430—Household Weights and Measures Card

NBS Circular 1035—Units and Systems of Weights and Measures—Their Origin, Development, and Present Status

NBS Circular 1056—Guidelines for Use of the Metric System

NBS Circular 1070—References on Metric Information

NBS Circular 1071—Factors for High Precision Conversion

NBS Circular 1078—The Metric System of Measurement (SI)—Federal Register Notice of October 26, 1977.

☆ U.S. GOVERNMENT PRINTING OFFICE : 1978 O—270-568

NBS-114A (REV. 7-73)

U.S. DEPT. OF COMM. BIBLIOGRAPHIC DATA SHEET	1. PUBLICATION OR REPORT NO. NBS SP-517	2. Gov't Accession No.	3. Recipient's Accession No.
4. TITLE AND SUBTITLE Report of the 62nd National Conference on Weights and Measures 1977			5. Publication Date August 1978 6. Performing Organization Code
7. AUTHOR(S) Editor: Harold F. Wollin			8. Performing Organ. Report No.
9. PERFORMING ORGANIZATION NAME AND ADDRESS NATIONAL BUREAU OF STANDARDS DEPARTMENT OF COMMERCE WASHINGTON, D.C. 20234			10. Project/Task/Work Unit No. 11. Contract/Grant No.
12. Sponsoring Organization Name and Complete Address (Street, City, State, ZIP) National Bureau of Standards Washington, D.C. 20234			13. Type of Report & Period Covered Final 14. Sponsoring Agency Code

15. SUPPLEMENTARY NOTES

Library of Congress Catalog Card Number: 26-27766

16. ABSTRACT (A 200-word or less factual summary of most significant information. If document includes a significant bibliography or literature survey, mention it here.)

This is a report of the proceedings (edited) of the 62nd National Conference on Weights and Measures, sponsored by the National Bureau of Standards, held in Dallas, Texas, July 17-22, 1977, and attended by State, county, and city weights and measures officials, the Federal Government, business, industry, and consumer organizations.

Major issues discussed at this Conference included metric conversion in the United States; problems relating to the quantity fill, labeling, and inspection of packaged commodities; requirements covering the design and performance of new weighing and measuring technology; and recommendations for improvement in weights and measures administration.

17. KEY WORDS (six to twelve entries; alphabetical order; capitalize only the first letter of the first key word unless a proper name; separated by semicolons) Consumer affairs; education; electronic devices; enforcement; Grain Standards Act; International Organization of Legal Metrology; labeling insulation and polyethylene products; metrication; model laws and regulations; national type approval; specifications and tolerances; vapor recovery; weights and measures.

18. AVAILABILITY	19. SECURITY CLASS (THIS REPORT)	21. NO. OF PAGES
[x] Unlimited [ ] For Official Distribution. Do Not Release to NTIS [x] Order From Sup. of Doc., U.S. Government Printing Office Washington, D.C. 20402, SD Stock No. SN003-003- $4.25 [ ] Order From National Technical Information Service (NTIS) Springfield, Virginia 22151	UNCLASSIFIED 20. SECURITY CLASS (THIS PAGE) UNCLASSIFIED	303 22. Price $4.25

USCOMM-DC 29042-P74

NBS TECHNICAL PUBLICATIONS

PERIODICALS

JOURNAL OF RESEARCH—The Journal of Research of the National Bureau of Standards reports NBS research and development in those disciplines of the physical and engineering sciences in which the Bureau is active. These include physics, chemistry, engineering, mathematics, and computer sciences. Papers cover a broad range of subjects, with major emphasis on measurement methodology, and the basic technology underlying standardization. Also included from time to time are survey articles on topics closely related to the Bureau's technical and scientific programs. As a special service to subscribers each issue contains complete citations to all recent NBS publications in NBS and non-NBS media. Issued six times a year. Annual subscription: domestic $17.00; foreign $21.25. Single copy, $3.00 domestic; $3.75 foreign.

Note: The Journal was formerly published in two sections: Section A "Physics and Chemistry" and Section B "Mathematical Sciences."

DIMENSIONS/NBS

This monthly magazine is published to inform scientists, engineers, businessmen, industry, teachers, students, and consumers of the latest advances in science and technology, with primary emphasis on the work at NBS. The magazine highlights and reviews such issues as energy research, fire protection, building technology, metric conversion, pollution abatement, health and safety, and consumer product performance. In addition, it reports the results of Bureau programs in measurement standards and techniques, properties of matter and materials, engineering standards and services, instrumentation, and automatic data processing.

Annual subscription: Domestic, $11.00; Foreign $13.75

NONPERIODICALS

Monographs—Major contributions to the technical literature on various subjects related to the Bureau's scientific and technical activities.

Handbooks—Recommended codes of engineering and industrial practice (including safety codes) developed in cooperation with interested industries, professional organizations, and regulatory bodies.

Special Publications—Include proceedings of conferences sponsored by NBS, NBS annual reports, and other special publications appropriate to this grouping such as wall charts, pocket cards, and bibliographies.

Applied Mathematics Series—Mathematical tables, manuals, and studies of special interest to physicists, engineers, chemists, biologists, mathematicians, computer programmers, and others engaged in scientific and technical work.

National Standard Reference Data Series—Provides quantitative data on the physical and chemical properties of materials, compiled from the world's literature and critically evaluated. Developed under a world-wide program coordinated by NBS. Program under authority of National Standard Data Act (Public Law 90-396).

NOTE: At present the principal publication outlet for these data is the Journal of Physical and Chemical Reference Data (JPCRD) published quarterly for NBS by the American Chemical Society (ACS) and the American Institute of Physics (AIP). Subscriptions, reprints, and supplements available from ACS, 1155 Sixteenth St. N.W., Wash., D.C. 20056.

Building Science Series—Disseminates technical information developed at the Bureau on building materials, components, systems, and whole structures. The series presents research results, test methods, and performance criteria related to the structural and environmental functions and the durability and safety characteristics of building elements and systems.

Technical Notes—Studies or reports which are complete in themselves but restrictive in their treatment of a subject. Analogous to monographs but not so comprehensive in scope or definitive in treatment of the subject area. Often serve as a vehicle for final reports of work performed at NBS under the sponsorship of other government agencies.

Voluntary Product Standards—Developed under procedures published by the Department of Commerce in Part 10, Title 15, of the Code of Federal Regulations. The purpose of the standards is to establish nationally recognized requirements for products, and to provide all concerned interests with a basis for common understanding of the characteristics of the products. NBS administers this program as a supplement to the activities of the private sector standardizing organizations.

Consumer Information Series—Practical information, based on NBS research and experience, covering areas of interest to the consumer. Easily understandable language and illustrations provide useful background knowledge for shopping in today's technological marketplace.

Order **above** *NBS publications from: Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.*

Order **following** *NBS publications—NBSIR's and FIPS from the National Technical Information Services, Springfield, Va. 22161.*

Federal Information Processing Standards Publications (FIPS PUB)—Publications in this series collectively constitute the Federal Information Processing Standards Register. Register serves as the official source of information in the Federal Government regarding standards issued by NBS pursuant to the Federal Property and Administrative Services Act of 1949 as amended, Public Law 89-306 (79 Stat. 1127), and as implemented by Executive Order 11717 (38 FR 12315, dated May 11, 1973) and Part 6 of Title 15 CFR (Code of Federal Regulations).

NBS Interagency Reports (NBSIR)—A special series of interim or final reports on work performed by NBS for outside sponsors (both government and non-government). In general, initial distribution is handled by the sponsor; public distribution is by the National Technical Information Services (Springfield, Va. 22161) in paper copy or microfiche form.

BIBLIOGRAPHIC SUBSCRIPTION SERVICES

The following current-awareness and literature-survey bibliographies are issued periodically by the Bureau:

Cryogenic Data Center Current Awareness Service. A literature survey issued biweekly. Annual subscription: Domestic, $25.00; Foreign, $30.00.

Liquified Natural Gas. A literature survey issued quarterly. Annual subscription: $20.00.

Superconducting Devices and Materials. A literature survey issued quarterly. Annual subscription: $30.00. Send subscription orders and remittances for the preceding bibliographic services to National Bureau of Standards, Cryogenic Data Center (275.02) Boulder, Colorado 80302.

U.S. DEPARTMENT OF COMMERCE
National Bureau of Standards
Washington, D.C. 20234

OFFICIAL BUSINESS

Penalty for Private Use, $300

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF COMMERCE
COM-215

U.S.MAIL

SPECIAL FOURTH-CLASS RATE
BOOK

9721