

# *Uniformity in Weights and Measures Laws and Regulations*

Today we take it for granted that when we buy a pound of hamburger, whether we are in New York, St. Louis, or California, we will be getting the same amount of product for our money. A hundred years ago consumers could not be so sure that a “pound” in one state was the same as a “pound” in another. Concerns about the uniformity of weights and measures standards and laws from state to state led the National Bureau of Standards to convene the first “Conference on the Weights and Measures of the United States” in January 1905. This first meeting laid the foundation for the creation of the National Conference on Weights and Measures (NCWM), which continues to this day. The NCWM is the primary mechanism used by NIST to fulfill its responsibility, as stated in its Organic Act, to work with the states “in securing uniformity in weights and measures laws and methods of inspection.” Only 11 delegates attended the first Conference; however, there are now over 3,000 NCWM members representing state and local weights and measures jurisdictions, the Federal Government, industry, consumers, and other countries.

NBS published the report of the 1905 Conference and has since published the reports of the 83 other Conferences held since that first meeting [1]. The reports document the history of the NCWM’s development of standards in the form of model weights and measures laws, regulations, and practices. When state and local weights and measures jurisdictions adopt these standards, they become mandatory. The reports of the Conference serve as a legislative history of the requirements in the model laws; therefore, state officials, the NIST Office of Weights and Measures, Federal and international standards agencies, members of the public, and others often consult the reports to identify the intent of the requirements. The reports contain a wealth of technical and historical information, including special addresses by NCWM Chairmen and by NBS/NIST Directors, who have served as Honorary Presidents of the NCWM. It would not be practical to describe all the reports in this centennial book; however, particular attention is called to the report of the first Conference because of its historical significance. In addition, it contains a history of U.S. weights and measures from the beginnings of the country up to 1905. This historical information was used as the basis for later

NBS publications, such as SP 447, *Weights and Measures Standards of the United States, A Brief History* [2].

Over the years, the uniform laws, regulations, and practices developed by NIST in cooperation with the NCWM have been gathered together and published in a series of NIST Handbooks. Two Handbooks of particular note are Handbook 44, *Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices* [3], and Handbook 130, *Uniform Laws and Regulations, in the areas of legal metrology and engine fuel quality* [4].

Handbook 44 was first published in 1949, having been preceded by similar handbooks of various designations and in several forms, beginning in 1918. This Handbook has become the standard for specifications and tolerances for commercial weighing and measuring devices in the United States. These devices include scales, liquid-measuring devices, volumetric measures, linear-measuring devices, mass flow meters, grain moisture meters, timing devices, near infrared grain analyzers, and multiple dimension measuring devices. All 50 states have adopted the Handbook as the legal basis for regulating commercial weighing and measuring devices. It is updated by NIST each year following the Annual Meeting of the NCWM to include changes adopted at the meeting. A NIST staff member serves as Technical Advisor to the NCWM Specifications and Tolerances Committee, which recommends changes and additions to the Handbook. Nearly 3,000 copies of the Handbook are distributed annually to NCWM members. Another thousand copies are sold through the Government Printing Office and hundreds of copies are distributed to Depository Libraries throughout the country. In addition, many associations reprint portions of the Handbook to distribute to their members. In a number of states, commercial weighing and measuring device servicepersons and agencies are required to demonstrate their knowledge and understanding of the Handbook in order to be registered by the states. The significance of the Handbook is further indicated by the fact that it serves as the basis for the National Type Evaluation Program (NTEP), a cooperative effort of NIST and the NCWM. NTEP evaluates models of weighing and measuring devices to determine if they meet the requirements of Handbook 44. Forty-four

states require that only weighing and measuring devices with an NTEP Certificate of Conformance can be installed in commercial applications in the state. (Fig. 1)

NIST Handbook 130 compiles the latest uniform laws and regulations and related interpretations and guidelines adopted by the NCWM. In 1979, NBS issued the first compilation of the various laws and regulations that had been adopted by the NCWM under the title "Model State Laws and Regulations." The name of the publication was later changed to make it clear that the standards in the publication were recommended for adoption by

local as well as state jurisdictions. Handbook 130 is the standard for uniform weights and measures laws and regulations in the United States. It has been estimated that weights and measures laws and regulations impact transactions involving \$4.5 trillion (52.8 %) of the \$8.51 trillion U.S. Gross Domestic Product (1998 figures). NIST technical advisors, working with members of the NCWM Laws and Regulations Committee, have helped develop and maintain the standards in Handbook 130. These standards have been widely adopted by the weights and measures community. For



**Fig. 1.** A New Mexico Weights and Measures Inspector tests a Liquefied Petroleum Gas Meter to determine its compliance with NIST Handbook 44 requirements.

example, 44 states have adopted a Weights and Measures Law based on the uniform law in Handbook 130. As of 1999, 45 states have adopted Packaging and Labeling requirements and 42 states have adopted Method of Sale requirements based on the uniform regulations in Handbook 130.

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## **Bibliography**

[1] Reports of the National Conference on Weights and Measures 1905—1999. Various editors over the years. Latest report: Henry

V. Oppermann and Joan Koenig (eds.), *Report of the 85th National Conference on Weights and Measures*, NIST Special Publication 957, National Institute of Standards and Technology, Gaithersburg, MD (2000).

[2] Lewis V. Judson, *Weights and Measures Standards of the United States, A Brief History*, NBS Special Publication 447, National Bureau of Standards, Washington, DC (1976).

[3] *Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices*, NIST Handbook 44 (various editors over the years; editors of the 2001 edition: Tina G. Butcher, Terry L. Grimes, and Juana Williams).

[4] *Uniform Laws and Regulations, in the areas of legal metrology and engine fuel quality*, NIST Handbook 130, (various editors over the years; editors of the 2001 edition: Thomas Coleman and Terry L. Grimes).