Legal Metrology in the United States

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NIST’s Role in Legal Metrology

To promote and help facilitate uniformity in legal metrology, especially in weights and measures standards and practices, and provide traceability to national standards.
Legal Metrology

- NIST does not have:
  - regulatory authority (police power);
  - authority over the States in weights and measures.

- Most weights and measures inspection activities are carried out at the state and local level.
- NIST encourages uniformity and provides traceability through cooperation, standards development, and training.
Office of Weights and Measures Activities

- **Coordination**
  - of responses to regulatory issues to promote uniformity and fair trade
  - traceability to SI

- **Technical Support to Stakeholders**
  - Regulatory officials
  - Business & industry
  - Standards Committees
  - Federal Agencies
  - Laboratories

- **Training**
  - State and Industry Laboratory Metrology
  - Field Officials
  - Administrators

- **Information Dissemination**
  - Publications and NIST Handbooks
  - Outreach/Website

- **Representation**
  - OIML, SIM, APLMF and other international organizations
Office of Weights and Measures Activities – Metric Program

- Facilitating the use of the metric system
  - Education
  - Promotion

- Voluntary Metric-Only Labeling
  - Since 1994 the Federal Fair Packaging and Labeling Act has required both metric and inch-pound units
  - 48 States allow metric only labeling, for products regulated at the state level
NIST Handbook 44

- “Specifications, Tolerances, and Other Technical Requirements for Commercial Weighing and Measuring Devices”
  - also applies to law enforcement equipment
- A product of the weights & measures community
- Published annually by NIST to promote uniformity
- Developed through the NCWM
- Adopted by all states
  - By reference
  - By incorporation
  - (Not all States use the same edition of Handbook 44)
- Available on the NIST Website
Handbook 130

- “Uniform Laws and Regulations in the areas of legal metrology and engine fuel quality”
- Published by NIST to promote uniformity
- Developed through the NCWM
- Uniform laws and regulations
  - Serve as template or model
- Adoption by States:
  - Some adopt in entirety
  - Some use as guideline
  - Some do not use at all
Handbook 133

• “Checking the Net Content of Packaged Goods”

• Published by NIST to promote uniformity in package inspections

• Developed through the NCWM

• Adoption by States:
  • 44 states or territories adopt in its entirety
  • 7 use as a guideline
  • 2 do not use at all
Other NIST Weights and Measures Publications

- NIST Handbooks 105 Series
  - Specifications for standards used to test commercial devices

- NIST Handbook 143 NISTIR 6969 & IR 7383
  - Laboratory metrology procedures and standards

- NIST Special Publications include
  - Interpretations (SP 330 and SP 811)
  - Guides
  - Manuals
U.S. Weights and Measures Jurisdictions*

55 States & Territories
250 Counties
300 Cities
605 Total W&M Jurisdictions

*the number of jurisdictions and percentages are estimates only.
Regulation of Weights and Measures in the United States

- Weights and measures regulations implemented at State and local government level

- No Federal regulation of weighing and measuring devices except for US Department of Agriculture (USDA)

- USDA Grain Inspection, Packers, & Stockyards Administration (GIPSA)
  - Regulates import and export of grain and related weighing and measuring equipment
  - Regulates livestock sales involved in interstate commerce
An unbroken chain from international standards to the market.
State Metrology Laboratories

- Most states have a state run laboratory
  - Some counties and territories also have a lab
- Laboratory metrologists trained at the NIST training laboratory for mass, volume, and length calibrations
- Labs are required to comply with NIST Handbook 143 for a certificate of traceability
  - Requirements are identical to ISO 17025 with some additions
How States Regulate Weighing and Measuring Devices

- Verifications are typically performed by government officials
  - Remains a law enforcement function
  - Eliminate actual and perceived bias and favoritism
  - Ensure uniform methods of inspection
  - Maintain direct control over process

- Officials verify accuracy/maintenance per NIST Handbook 44
  - Regulatory function, not a calibration service

- Typically, inspections conducted at least once per year
  - May vary frequency based on data & sampling plans
  - Respond to complaints between inspections
Registered Service Agents (Private)

- At least 43 States have some form of registration program
  - Service agencies must register with State
  - Some require minimum annual training, traceable standards & exam
  - Allows service company to repair, recalibrate, and place devices into service

- At least 2 States allow service companies to perform official inspection
  - Oversight still essential & required
  - Training, authorization, licensing and auditing
  - Revoking/suspending license if work is not correct
National Conference on Weights and Measures (NCWM)

- Established by NIST in 1905
  - Privatized in 1999
- A unique collaboration between industry and government to further cooperation with States and encourage uniformity
- Voluntary standards organization
  - Standards developed through a committee and public hearing process
  - Uniformity is achieved through adoption and use of the standards
National Conference on Weights and Measures (NCWM)

• Membership consists of weights and measures officials, and representatives from manufacturers, industry, associations, and federal agencies.

• While membership is open to everyone, only weights and measures officials have voting rights.

• The NCWM has no police power or authority over the states.
National Type Evaluation Program (NTEP)

- Program to evaluate “types” of weighing and measuring devices
  - Single evaluation to satisfy all states and Federal Agencies
  - Promotes uniformity of type evaluation, interpretation of HB 44
  - Successful evaluations result in NTEP Certificates of Conformance
  - Now expanding into OIML Mutual Acceptance Arrangement.

- Cooperative program among manufacturers, users, weights and measures officials
  - Private program managed by NCWM, Inc.

- Nearly all States require NTEP Certificate of Conformance for many types of commercial weighing and measuring equipment

- **Goal:** reduce the cost & time to get devices to market
NCWM Publication 14

• "NTEP Administrative Procedures, Technical Policy, Checklists and Test Procedures"

• Developed by NCWM Technical Committee on National Type Evaluation (NTETC)
  • Based on NIST Handbook 44

• Published annually by NCWM

• Used by NTEP laboratories to perform NTEP evaluations
Legal Metrology Responsibilities of U.S. Federal Agencies

- **Food and Drug Administration (FDA)**
  - foods & drugs (human & animal),
  - medical devices and cosmetics

- **United States Department Agriculture**
  - meat and poultry
  - produce (quality and grades)

- **United States Treasury Department**
  - tobacco, wine, beer, distilled spirits & alcohol
Legal Metrology Responsibilities of Federal Agencies

• Environmental Protection Agency
  • Vehicle and industrial emissions
  • Pesticides and herbicides

• Federal Trade Commission
  • Packaging and labeling of most consumer products sold at retail

• Department of Transportation
  • Compressed gases & hazardous materials
Example of Cooperation: Vehicle Speed Measurement

• NIST Office of Law Enforcement Standards and the Dept of Transportation NHTSA established US testing programs and documentary standards in cooperation with the International Association of Chiefs of Police (IACP).

• IACP maintains:
  • a Certified Product List for radar and lidar speed-measuring equipment,
  • documentary standards, and
  • Two testing laboratories.
Manual and Automated Speed Enforcement
OIML Project on Speed Measurement

• 20 year old OIML R91 being revised.
• Goal is the development of a performance based standard, same requirements regardless of technology
• Radar, lidar, time/distance technologies
• Manual and automated devices
International Legal Metrology Activities at NIST

International Organization of Legal Metrology (OIML)

Sistema Interamericano de Metrologia (SIM)

Asia-Pacific Legal Metrology Forum (APLMF)
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- [www.nist.gov/owm](http://www.nist.gov/owm)
Thank you very much!