NCWM PUBLICATION 15

COMMITTEE AGENDAS
FOR THE
2026 INTERIM MEETING

Mobile, Alabama / January 11-14, 2026

Prepared in Cooperation with the National Council on Weights and Measures, National Type Evaluation Program, National Institute of Standards and Technology Office of Weights and Measures, Central Weights and Measures Association, Northeastern Weights and Measures Association, Southern Weights and Measures Association and Western Weights and Measures Association.

NIST National Institute of Standards and Technology U.S. Department of Commerce

CWMA NEWMA

National Council on Weights and Measures Overview

National Council on Weights and Measures (NCWM), Inc. is a standards development organization for weights and measures regulatory agencies of the states, counties, and cities of the United States, as well as for federal agency use. The Annual Meeting brings together government officials and 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.

The programs of NCWM and its committees explore the broad area of this economically important segment of governmental regulatory service. NCWM develops and recommends laws and regulations, technical codes for weighing and measuring devices used in commerce, test methods, enforcement procedures, and administrative guidelines for adoption by regulatory agencies in the interest of promoting uniformity of requirements and methods among state and local jurisdictions.

A major objective of NCWM is to foster understanding and cooperation among weights and measures officials and all industrial, business, and consumer interests. NCWM has been cited on numerous occasions for its outstanding success. The National Institute of Standards and Technology (NIST) have statutory responsibility for "cooperation with the states in securing uniformity of weights and measures laws and methods of inspection." Opinions expressed in submitted documents are those of the authors and not necessarily those of NCWM. Contributors are solely responsible for the content and quality of their material.

Kevin Schnepp, NCWM Chairman
California

Dear NCWM Colleagues,

Welcome to Mobile, Alabama as we convene the National Council on Weights and Measures 2026 Interim Meeting January 11-13. Mobile is known for its historic architecture and as the birthplace of America's first Mardi Gras celebration. As one of the oldest cities on the Gulf Coast, Mobile has plenty of stories to tell. Mobile has the unique historical distinction as a city that has flown under five (5) different flags: French, English, Spanish, Confederate and American. Take some time to visit Conde-Charlotte Museum, Colonial Fort Conde, and USS ALABAMA Battleship Memorial Park to learn more about Mobile's rich history.

During this week we collectively work to develop the model laws and standards published in the National Institute of Standards and Technology (NIST) Handbook 44 *Specifications and Tolerances and Other Technical Requirements for Weighing and Measuring Devices*, NIST Handbook 130 *Uniform Laws and Regulations in the areas of legal metrology and fuel quality*, and NIST Handbook 133 *Checking the Net Contents of Packaged Goods*. By the time we meet, the four regional associations will have met and provided valuable input on the items on our agenda. Each region's input is vital to the standards development process and ensures that the model laws published in the NIST Handbooks can be adopted in each jurisdiction to promote national uniformity in weights and measures jurisdiction thereby supporting our mutual goal of equity in the marketplace.

This week the NCWM standing committees will hold open hearings to hear comments, editorial suggestions, and status recommendations for the items on their respective agendas. Regulators, industry representatives, technical advisors from NIST, and any registered attendee are encouraged to make their positions and recommendations known for each agenda item important to them. The open hearings provide a forum for discussion and debate where disagreement is listened to with the intent to always understand and compromise where practical. In this fashion our meeting format can serve as model for how we, as a nation, can better communicate, collaborate, and improve while accepting different opinions rather than seeking to silence dissent.

I look forward to the meetings, discussions, and deliberations that will guide each of our standing committees and the Board on how to continue the evolution and improvement of the codes and standards published in Handbooks 44, 130, and 133 as well as enhance the recognition and standing of our organization, the National Council on Weights and Measures. I urge you to read and review Publication 15, all position letters, and any supporting data available on the NCWM website in advance of the meeting. We measure what matters so that equity may prevail. If there is anything the Board or the NCWM team can assist with in making the event more valuable or enjoyable, please do not hesitate to ask.

Sincerely,

Kevin Schnepp, Chair

Table of Contents

Schedule of Events

The schedule of events is tentative and subject to change.

Sunday, January 11, 2026		**Room**
8:00 a.m. – 10:00 a.m.	Coffee Service	2nd Floor Foyer
8:00 a.m. – 5:00 p.m.	Registration and Exhibits	2nd Floor Foyer
9:00 a.m. – 10:15 a.m.	CALM – Community for All Legal Metrologists	Schooner
9:00 a.m. – 10:15 a.m.	NCWM Standards Development Task Group	Windjammer
9:00 a.m. – 10:15 a.m.	Member Education and Mentorship Subcommittee ***New Attendees and Members Encouraged to Attend***	Riverboat
9:00 a.m. - 11:30 a.m.	Meter Manufacturers Association	Clipper
10:30 a.m. – 11:30 a.m.	Metrology Subcommittee	Schooner
10:30 a.m. – 11:30 a.m.	Fraud Prevention & Education Task Group	Windjammer
10:30 a.m. – 11:30 a.m.	Women in Weights & Measures	Riverboat
11:30 a.m. – 1:00 p.m.	Lunch on Your Own	
1:00 p.m. – 2:15 p.m.	Uniform Shipment Law Task Group	Schooner
1:00 p.m. – 3:15 p.m.	FALS – Fuels & Lubricants Subcommittee	Windjammer
1:00 p.m. – 2:15 p.m.	OTH-25.1 Q&A	Riverboat
1:00 p.m. – 2:15 p.m.	PALS – Packaging & Labeling Subcommittee	Clipper
2:30 p.m. – 3:45 p.m.	EVSE Training Planning Committee	Schooner
2:30 p.m. – 3:45 p.m.	Moisture Allowance Task Group	Riverboat
2:30 p.m. – 3:45 p.m.	Safety Subcommittee	Clipper
4:00 p.m. – 5:00 p.m.	Joint Session with Committee Reports	Bon Secour Bay II & III
5:30 p.m. – 7:00 p.m.	Chair's Reception: Honoring Kevin Schnepp	The Harbor Room

Monday, January 12, 2026		**Room**
7:30 a.m. – 9:00 a.m.	Light Breakfast	2nd Floor Foyer
7:30 a.m. – 5:00 p.m.	Registration and Exhibits	2nd Floor Foyer
	Committee hearings will occur in the order presented below. Hearing times are not firm, when one Committee finishes, the next Committee will begin.	
8:30 a.m. – 12:00 p.m.	**Official Session – Open Hearings**	Bon Secour Bay II & III
	Laws and Regulations Committee	
	Specifications and Tolerances Committee	
	Professional Development Committee	
	Board of Directors / NTEP Committee	
12:00 p.m. – 1:00 p.m.	Lunch on Your Own	
1:00 p.m. – 5:00 p.m.	Official Session – Open Hearings Continued	Bon Secour Bay II & III

Tuesday, January 13, 2026		**Room**
7:30 a.m. – 9:00 a.m.	Light Breakfast	2nd Floor Foyer
7:30 a.m. – 5:00 p.m.	Registration and Exhibits	2nd Floor Foyer
7:30 a.m. – 8:30 a.m.	Associate Membership Committee	Schooner
	Committee hearings will occur in the order presented below. Hearing times are not firm, when one Committee finishes, the next Committee will begin.	
8:30 a.m. – 12:00 p.m.	**Official Session – Open Hearings Continued**	Bon Secour Bay II & III
	Laws and Regulations Committee	
	Specifications and Tolerances Committee	
	Professional Development Committee	
	Board of Directors / NTEP Committee	
12:00 p.m. – 1:30 p.m.	Lunch on Your Own	
1:30 p.m. – 5:00 p.m.	**Committee Work Sessions**	
	Laws and Regulations Committee	Schooner
	Specifications and Tolerances Committee	Windjammer
	Professional Development Committee	Riverboat
	Board of Directors / NTEP Committee	Clipper

Wednesday, January 14, 2026		**Room**
7:30 a.m. – 9:00 a.m.	Light Breakfast	2nd Floor Foyer
7:30 a.m. – 12:00 p.m.	Registration and Exhibits	2nd Floor Foyer
9:00 a.m. – 10:45 a.m.	**Technical Session** *From Calibration to Combustion: Managing Risk During Meter Proving* Steve Berry, VP of Education and Safety, National Air Transportation Association This session examines a fuel truck fire that occurred following a routine meter-proving operation, highlighting how gaps in hazard awareness and procedural discipline can lead to serious ignition risks. Using the incident that prompted NATA's Safety 1st Alert 2025.3, the presentation explores contributing risk factors—particularly splash loading and static electricity—and outlines practical controls to strengthen safety during meter-proving activities	Bon Secour Bay II & III
11:00 a.m. – 12:00 p.m.	Joint Committee Meeting	Bon Secour Bay II & III

Schedule of Events

2025-2026 Organization Chart

NCWM Board of Directors

Office	Name	Affiliation	Term Ends
NCWM Chair	Kevin Schnepp	California	2026
NCWM Chair-Elect	Jason Flint	New Jersey	2026
NCWM Immediate Past Chair	Marc Paquette	Vermont	2026
Treasurer	Mahesh Albuquerque	Colorado	2026
Active Membership – Central	Daniel Walker	Ohio	2030
Active Membership - Western	Bill Striejewske	Nevada	2027
Active Membership - Southern	Paul Floyd	Louisiana	2028
Active Membership - Northeastern	Jim Willis	New York	2029
At-Large	Dr. Matthew Curran	Florida	2026
At-Large	Jason Glass	Kentucky	2028
Associate Membership	Ray Johnson	Fairbanks Scales	2028
Honorary NCWM President	Craig Burkhardt	NIST Acting Director	NA
Executive Director	Don Onwiler	NCWM	NA
Executive Secretary	Dr. Katrice Lippa	NIST, Office of Weights and Measures	NA
NTEP Administrator	Jeff Gibson	NCWM	NA
Measurement Canada Advisor	Erica Garnier	Measurement Canada	NA

National Type Evaluation Program (NTEP) Committee

Office	Name	Affiliation	Term Ends
Committee Chair	Marc Paquette	Vermont	2026
NTEP Administrator	Jeff Gibson	NCWM	NA
Members	Kevin Schnepp	California	2027
	Jason Flint	New Jersey	2028
	Paul Floyd	Louisiana	2028
	Daniel Walker	Ohio	2030

Finance Committee

Office	Name	Affiliation	Term Ends
Committee Chair	Jason Flint	New Jersey	2026
Nominated Chairman-Elect	TBD		2026
Treasurer	Mahesh Albuquerque	Colorado	2026
AMC Representative	Ray Johnson	Fairbanks Scales	2028
Executive Director	Don Onwiler	NCWM	NA

Laws and Regulations Committee (L&R)

Office	Name	Affiliation	Term Ends
Chair	Mauricio Mejia	Florida	2026
Vice-Chair	Michael Peeler	New Jersey	2027
Members	Mike Harrington	Iowa	2028
	Austin Shepherd	San Diego County, CA	2029
	Jose Arriaga	Orange County, CA	2030
AMC Representative	Brent Price	Gilbarco	2028
Canadian Technical Advisor	Rowan Hemsing	Measurement Canada	NA
NIST Technical Advisors	John McGuire	NIST, Office of Weights and Measures	NA
	Loren Minnich	NIST, Office of Weights and Measures	NA
Committee Coordinator	Constantine Cotsoradis	NCWM	NA

Professional Development Committee (PDC)

Office	Name	Affiliation	Term Ends
Chair	Scott Wagner	Colorado	2026
Vice-Chair	Shane Ireland	Maine	2027
Members	Sherry Turvey	Kansas	2028
	Valerie Forbes	Delaware	2029
	Brent Ricks	Montana	2030
AMC Representative	Perry Lawton	TESCO	2028
Canadian Technical Advisor	Marie-Paul Vanasse	Measurement Canada	NA
Safety Liaison	John Satterlee	Illinois	NA
NIST Liaison	Vacant	NIST, Office of Weights and Measures	NA
Professional Certification Coordinator	Jerry Buendel	Retired	NA

Specifications and Tolerances Committee (S&T)

Office	Name	Affiliation	Term Ends
Chair	Mark Lovisa	Louisiana	2028
Vice-Chair	Brett Willhite	Minnesota	2029
Members	Alison Wilkinson	Maryland	2026
	Scott Dolan	Vermont	2027
	Nathan Waldron	Nevada	2030
Canadian Technical Advisor	Éric Turcotte	Measurement Canada	NA
NIST Technical Advisors	Loren Minnich	NIST, Office of Weights and Measures	NA
	Juana Williams	NIST, Office of Weights and Measures	NA
NCWM Technical Advisors	Darrell Flocken	NCWM, NTEP Evaluator	NA
	Allen Katalinic	NCWM, NTEP Evaluator	NA
Committee Coordinator	Brian Terry	Arkansas	NA

Nominating Committee

Office	Name	Affiliation	Term Ends
Chair	Marc Paquette	Vermont	2026
Members	Bill Callaway	OWL Services	2026
	Konrad Crockford	North Dakota	2026
	Kurt Floren	Los Angeles County, CA	2026
	Valerie Forbes	Delaware	2026
	Frank Greene	Connecticut	2026
	Miland Kofford	Utah	2026

Credentials Committee

Office	Name	Affiliation	Term Ends
Chair	Lina Ng	Los Angeles County, CA	2026
Coordinator	Jeff Gibson	NCWM, NTEP Administrator	NA
Members	Kate Smetana	Colorado	2027
	Brian Terry	Arkansas	2028

Appointed Officials

Office	Name	Affiliation	Term Ends
Chaplain	Scott Simmons	Retired	2026
Parliamentarian	Chuck Corr	Retired	2026
Presiding Officers	Matt Douglas	California	2026
	Christina Osborn	Texas	2026
	Steve Timar	New York	2026
	Sherry Turvey	Kansas	2026
Sergeants-at-Arms	TBD	Pennsylvania	2026
	TBD	Pennsylvania	2026

Associate Membership Committee (AMC)

Office	Name	Affiliation	Term Ends
Chair	Jim Pettinato	Guidant Measurement	2026
Vice-Chair	Brent Price	Gilbarco	2026
Secretary/Treasurer	Reid Wagner	Growth Energy	2026
Members	David Boykin	NCR Corporation	2026
	Bill Callaway	OWL Services	2030
	Ray Johnson	Fairbanks Scales	2030
	Perry Lawton	TESCO	2030
	Bob Murnane	Seraphin Test Measure	2030
	Prentiss Searles	American Petroleum Institute	2030
	Christopher Wagner	National Propane Gas Association	2030

Fuels and Lubricants Subcommittee (FALS)

Office	Name	Affiliation
Chair	Vanessa Benchea	Florida
Vice-Chairs	Ron Hayes	Retired
	Randy Jennings	Retired
Secretaries	Jennifer Green	CITGO
	Prentiss Searles	American Petroleum Institute
NIST Technical Advisors	John McGuire	NIST, Office of Weights and Measures
	Loren Minnich	NIST, Office of Weights and Measures
Public Sector Members	Mahesh Albuquerque	Colorado
	David Au	Georgia
	Stephen Benjamin	Retired
	David Deroche	Lousisana
	Uriel Fuentes	New Mexico
	Mike Harrington	Iowa
	Dr. Marcus Helfrich	North Carolina
	Megan McWayne	California
	Vernon Miller	Nevada
	Kevin Schnepp	California
	Bill Striejewske	Nevada
	Dr. Jenny Tabbert	Colorado
	Kevin Upschulte	Missouri
	Timothy White	Michigan
Priavte Sector Members	Holly Alfano	Independent Lubricant Manufacturers Association
	Teresa Alleman	Holly Energy
	Scott Boorse	PEI
	Chuck Corr	Retired
	Scott Fenwick	Clean Fuels Alliance America
	Marilyn Herman	Herman and Associates
	Joanna Johnson	Johnson Policy Associates
	Brian Kernke	Love's Travel Stops
	David A. Kovach	BP Products
	Michael Kunselman	Center for Quality Assurance
	Robert Legg	Southwest Research
	Russ Lewis	Marathon Petroleum
	Kristy Moore	KMoore Consulting
	Jeanelle Morris	Navistar
	Jim Rocco	Energy Marketers of America
	Matthew Sheehan	Chevron U.S.A.
	Reid Wagner	Growth Energy
Advisory Member	Curtis Williams	Retired

Member Education and Mentorship Subcommittee

Office	Name	Affiliation
Chair	Brian Fuller	Iowa
Public Sector Members	Cheryl Ayer	New Hampshire
	Ethan Bogren	Westchester County, NY
	Scott Ferguson	Michigan
	Dave Finck	Ohio
	Paul Floyd	Louisiana
	Miland Kofford	Utah
	Christina Osborn	Texas
	Brent Ricks	Montana
	Jim Willis	New York
Private Sector Members	Jerry Buendel	Retired
	Chuck Corr	Retired
	Scott Fenwick	Clean Fuels Alliance America
	Bob Murnane	Seraphin Test Measure

Metrology Subcommittee

Office	Name	Affiliation
Chair	Frank Greene	Connecticut
Co-Chair	Lisa Corn	Texas
NIST Technical Advisor	Micheal Hicks	NIST, Office of Weights and Measures
Public Sector Members	Whitney Corley	Louisiana
	Scott Dolan	Vermont
	David Fraser	Montana
	Leslie German	Washington
	James Kellames	Nevada
	Lina Ng	Los Angeles County, CA
	Marc Paquette	Vermont
	Kiara Riske	Nevada
	Kate Smetana	Colorado
	Bill Striejewske	Nevada
	Daniel Walker	Ohio

Packaging and Labeling Subcommittee (PALS)

Office	Name	Affiliation
Chair	Chris Guay	Retired
NIST Technical Advisor	John McGuire	NIST, Office of Weights and Measures
Public Sector Member	Cheryl Ayer	New Hampshire
	Allison Dumas	Louisiana
	Chad Pilie	Arizona
	Eric Rauch	Iowa
Advisory Sector Members	Krister Hard af Segerstad	Retired
	Zina Juroch	Retired

Safety Subcommittee

Office	Name	Affiliation
Chair	John Satterlee	Illinois
Public Sector Members	John Bell	Missouri
	David Fraser	Montana
	Michael Peeler	New Jersey
Private Sector Members	Bill Callaway	OWL Services

	Robert LaGasse	Mulch and Soil Council
	Christopher Wagner	National Propane Gas Association

Women in Weights and Measures Subcommittee

Office	Name	Affiliation
Chair	Cheryl Ayer	New Hampshire
Co-Chair	Brandi Harder	Rice Lake Weighing Systems
Public Sector Members	Vanessa Benchea	Florida
	Teri Berken	Louisiana
	Nathalie Campeau	Measurement Canada
	Heather Chappell	Tompkins County, NY
	Roxanne Chepsongol	New Mexico
	Delia Cioc	Riverside County, CA
	Whitney Corley	Louisiana
	Melissa Cregan	Fresno County, CA
	Allison Dumas	Louisiana
	Valerie Forbes	Delaware
	Erica Garnier	Measurement Canada
	Elaine Grillo	City of Boston, MA
	Sabine Koerner	Louisiana
	Samantha Lange	Wisconsin
	Lauren Lee	Michigan
	Misael Martinez	Riverside County, CA
	Michelle McCulley	Maryland
	Vanessa Miles	Louisiana
	Lina Ng	Los Angeles County, CA
	Christina Osborn	Texas
	Cheryll Parker	USDA
	Amanda Perez	New Mexico
	Cathy Roach	Alemeda County, CA
	Julia Schilpp	Missouri
	Kate Smetana	Colorado
	Dr. Jenny Tabbert	Colorado
	Isabelle Tremblay	Measurement Canada
	Annie Tsou	Los Angeles County, CA
	Sherry Turvey	Kansas
	Marie-Paul Vanasse	Measurement Canada
	Alison Wilkinson	Maryland
Private Sector Members	Nicole Byndas	Marathon Petroleum Company
	Tina Butcher	Retired
	Christie Cordova	Georgia-Pacific Wood Products
	Courtney Ferguson	OWL Services
	Jessica Ferree	Mettler-Toledo
	Marilyn Herman	Herman and Associates
	Jennifer Hopes	USDA/AMS/FTPP Packers and Stockyards Div.

Cannabis Task Group

Office	Name	Affiliation
Chair	TBD	
Public Sector Members	Brad Bachelder	Maine
	Kipp Blauer	Nevada
	Ethan Bogren	Westchester County, NY
	James Cassidy	Retired
	Mark Ciociolo	City of Worcester, MA
	Dr. Matthew Curran	Florida
	Jason Flint	New Jersey
	Kurt Floren	Los Angeles County, CA
	Frank Greene	Connecticut
	Elaine Grillo	City of Boston, MA
	Ivan Hankins	Iowa
	Mike Harrington	Iowa
	Robert Huff	Delaware
	Mauricio Mejia	Florida
	Angel Nazario	City of Boston, MA
	Bill Rigby	Utah
	Louis Sakin	Towns of Holliston, Hopkinton, Northbridge, MA
	Kate Smetana	Colorado
	Dedrick Stephens	City of Cleveland, OH
	Ron Valinski	City of Worcester, MA
	Craig VanBuren	Michigan
	Jim Willis	New York
	Aaron Yanker	Colorado
Private Sector Members	Michael Bronstein	ATACH
	Brian Duncan	Field Laboratory Seven
	Evan Foisy	A&D Engineering
	Chris Guay	Retired
	Joanna Johnson	Johnson Policy Associates
	Chuck Olivier	DBS
	Ben Raham	WIPOTEC-OCS

EVSE Task Group

Office	Name	Affiliation
Chair	Kevin Schnepp	California
NCWM Technical Advisor	Jeff Gibson	NCWM, NTEP Administrator
NIST Technical Advisors	Dr. Katrice Lippa	NIST, Office of Weights and Measures
	David Sefcik	NIST, Office of Weights and Measures
Public Sector Members	Mahesh Albuquerque	Colorado
	Scott Dolan	Vermont
	Marc Paquette	Vermont
	Daniel Walker	Ohio
Private Sector Members	Perry Lawton	TESCO
	Justin Wilson	ChargePoint

EVSE Training Planning Committee

Office	Name	Affiliation
Chair	Mahesh Albuquerque	Colorado
NCWM	Danyelle Dolan	NCWM, Project Coordinator
	Jeff Gibson	NCWM, NTEP Administrator
	Elisa Stritt	NCWM, Director of Operations
Board of Directors	Kevin Schnepp	California
	Daniel Walker	Ohio
NIST	Dr. Katrice Lippa	NIST, Office of Weights and Measures
	David Sefcik	NIST, Office of Weights and Measures
	Mike Stocker	NIST, Office of Weights and Measures
Associate Membership Committee	Bill Callaway	OWL Services
Professional Development Committee	Ethan Bogren	Westchester County, NY
	Perry Lawton	TESCO
EV Industry	Courtney Ferguson	OWL Services
	Steve Griffith	NEMA
	Mal Skowron	Tesla
	Justin Wilson	ChargePoint

Fraud Prevention and Education Task Group

Office	Name	Affiliation
Chair	Alan Walker	Florida
Co-Chair	Matthew Williams	Texas
Public Sector Members	Paul Floyd	Louisiana
	Mike Harrington	Iowa
	Robert Huff	Delaware
	Michael Kelly	Westchester County, NY
	John Larkin	California
	John McGuire	NIST, Office of Weights and Measures
	Michael Peeler	New Jersey
Private Sector Members	Scott Boorse	PEI
	Brent Price	Gilbarco
	Mike Roach	PDI
	Scott Schober	Berkley Varitronics Systems

Milk Meter Tolerance Task Group

Office	Name	Affiliation
Chair	Aaron Yanker	Colorado
NTEP Technical Advisor	Allen Katalinic	NCWM, NTEP Evaluator
NIST Technical Advisor	G. Diane Lee	NIST, Office of Weights and Measures
Canadian Technical Advisor	Éric Turcotte	Measurement Canada
Public Sector Members	Mitchell Marsalis	Louisiana
	Joel Northrop	USDA
	Jim Willis	New York

Moisture Allowance Task Group

Office	Name	Affiliation
Chair	Tory Brewer	West Virginia
NIST Technical Advisor	John McGuire	NIST, Office of Weights and Measures
Public Sector Member	Lisa Corn	Texas
	Kurt Floren	Los Angeles County, CA
	Steve Timar	New York
	Craig VanBuren	Michigan
	Ken Vehrkens	New Jersey

NCWM Standards Development Task Group

Office	Name	Affiliation
Chair	Jason Flint	New Jerrsey
Industry Representative	Chuck Corr	Retired
SWMA Representative	Matt Curran	Florida
WWMA Representative	Kurt Floren	Los Angeles County, CA
CWMA Representative	Mike Harrington	Iowa
NIST OWM Representative	John McGuire	NIST, Office of Weights and Measures
NCWM Representative	Don Onwiler	NCWM

Policy and Bylaw Review Task Group

Office	Name	Affiliation
Chair	Chris Guay	Retired
Executive Director	Don Onwiler	NCWM
Public Sector Member	Mahesh Albuquerque	Colorado
	Ivan Hankins	Iowa
Private Sector Members	Chuck Corr	Retired

Promotional Toolkit Task Group

Office	Name	Affiliation
Chair	Stephen Benjamin	Retired
Public Sector Members	Jerry Buendel	Retired
	Kurt Floren	Los Angeles County, CA
Private Sector Member	Bill Callaway	OWL Services

Transportation-for-Hire Systems Task Group

Office	Name	Affiliation
Chair	Mark Lovisa	Louisiana
NTEP Technical Advisor	Jeff Gibson	NCWM, NTEP Administrator
NIST Technical Advisor	John McGuire	NIST, Office of Weights and Measures
Public Sector Members	Sean Bouffiou	King County, WA
	Katrina Eberly	New Jersey
	Cregan Newhouse	City of Seattle, WA
	Michael Peeler	New Jersey

Uniform Shipment Law Task Group

Office	Name	Affiliation
Chair	Miland Kofford	Utah
NIST Technical Advisor	TBD	NIST, Office of Weights and Measures
Canadian Technical Advisor	Nathalie Campeau	Measurement Canada
Public Sector Members	Cheryl Ayer	New Hampshire
	John Dillabaugh	Pennsylvania
	Rowan Hemsing	Measurement Canada
	Robert Meadows	Kansas
	Erik Stanton	New Hampshire
	Ken Vehrkens	New Jersey
Private Sector Member	Lance Arbogast	XPOLogistics
	Steven Chapman	XPOLogistics
	Karen Claussen	Heatlines
	Jeff Cooper	NMFTA
	James Hannum	Subject Matter Specialist
	Victor Mata	NMFTA

Verification Scale Division (e) Task Group

Office	Name	Affiliation
Chair	Evan Foisy	A&D Engineering
NTEP Technical Advisor	Jeff Gibson	NCWM, NTEP Administrator
NIST Technical Advisor	Jan Konijnenburg	NIST, Office of Weights and Measures
Canadian Technical Advisor	Éric Turcotte	Measurement Canada
Public Sector Members	Loren Minnich	NIST, Office of Weights and Measures
	Steve Timar	New York
Private Sector Members	Chuck Olivier	DBS
	Richard Suiter	Richard Suiter Consulting
At-Large Members	Ross Andersen	Retired
	Steve Cook	Retired

NTEP Grain Analyzer Sector

Office	Name	Affiliation
Chair	Jimmy Williams	Missouri
NTEP Technical Advisors	Jeff Gibson	NCWM, NTEP Administrator
	Brian Maser	NCWM, NTEP Evaluator
NIST Technical Advisor	G. Diane Lee	NIST, Office of Weights and Measures
Public Sector Members	Steve Carter	Illinois
	Ivan Hankins	Iowa
	Jason Jordan	USDA, FGIS, Technical Services Division
	Robert Meadows	Kansas
	Loren Minnich	NIST, Office of Weights and Measures
	Stephanie Somers	Illinois
Private Sector Members	Jeffrey Adkisson	Grain and Feed Association of Illinois
	Rachel Beiswenger	TSI Incorporated
	Casey Frakes	The Steinlite Corporation
	Charles Hurburgh, Jr.	Iowa State University
	Jess McCluer	National Grain and Feed Association
Advisory Member	Cassie Eigenmann	Retired

NTEP Measuring Sector

Office	Name	Affiliation
Chair	Brent Price	Gilbarco
NTEP Technical Advisors	Allen Katalinic	NCWM, NTEP Evaluator
	Jeff Gibson	NCWM, NTEP Administrator
NIST Technical Advisor	G. Diane Lee	NIST, Office of Weights and Measures
Public Sector Members	Steve Carter	Illinois
	Lucia D'Ulivo	Measurement Canada
	Alison Wilkinson	Maryland
	Jack Witt	California
Private Sector Members	Steve Bar	Bennett Pump Company
	Lyle Baron	Fill-Rite
	Craig Cavanaugh	Tuthill Transfer Systems
	Rodney Cooper	Consultant
	Rick Costa	Wingfield Scale Company
	Treyton Drake	Advanced Flow Solutions dba Corken
	Ronnell Gallon	Zenner Performance Meters
	John Hathaway	Murray Equipment
	Dmitri Karimov	Liquid Controls
	Michael Keilty	Endress + Hauser Flowtec AG, USA
	Douglas Long	RDM Industrial Electronics
	Mark McMurtrey	Wayne Fueling Systems
	Richard Miller	Guidant Measurement
	Andre Noel	Neptune Technology Group
	Robin Parsons	Parafour Innovations
	Jim Pettinato	Guidant Measurement

NTEP Software Sector

Office	Name	Affiliation
Chair	Jim Pettinato	Guidant Measurement
NTEP Technical Advisors	Jeff Gibson	NCWM, NTEP Administrator
	Brian Maser	NCWM, NTEP Evaluator
NIST Technical Advisor	Jan Konijnenburg	NIST, Office of Weights and Measures
Secretary	Teri Gulke	Liquid Controls
Public Sector Members	Tom Buck	Ohio
	Jeremy Coffey	Ohio
	Barry Stone	Ohio
	Jack Witt	California
Private Sector Members	Mary Abens	Emerson Process Management
	Rick Costa	Wingfield Scale Company
	Kevin Detert	Avery Weigh-Tronix
	Dion Harste	AgCode
	Chip Manuel	Instacart
	Dominic Meyer	KSi Conveyors
	Matt Miller	4DMobile
	Richard Miller	Guidant Measurement
	Chris Oldham	7-Eleven
	Mike Roach	PDI
	David Vande Berg	Vande Berg Scales

	John Wind	Ossid
	Kraig Wooddell	Hobart

NTEP Weighing Sector

Office	Name	Affiliation
Chair	Jessica Ferree	Mettler-Toledo
NTEP Technical Advisor	Jeff Gibson	NCWM, NTEP Administrator
	Brian Maser	NCWM, NTEP Evaluator
NIST Technical Advisor	Jan Konijnenburg	NIST, Office of Weights and Measures
Public Sector Members	Tom Buck	Ohio
	Kevin Chesnutwood	NIST, Mass and Force Group
	Robert Meadows	Kansas
	Loren Minnich	NIST, Office of Weights and Measures
	Barry Stone	Ohio
	Pascal Turgeon	Measurement Canada
Private Sector Members	Steven Beitzel	Systems Associates
	Rick Costa	Wingfield Scale Company
	Scott Davidson	Mettler-Toledo
	Tom Dorward	Mettler Toledo North America
	Andrew Goddard	Marel
	Brandi Harder	Rice Lake Weighing Systems
	Jon Heinlein	Transcell Technology
	Scott Henry	Zebra Technologies
	Sam Jalahej	Totalcomp
	Chip Manuel	Instacart
	Ben Raham	OCS Checkweighers
	Thomas Schuller	Cardinal Scale Manufacturing Company
	Wes Strawn	Red Seal Measurement
	John Wind	Ossid
Advisory Members	Robert Feezor	Retired
	Edward Luthy	Retired

NTEP EVSE Work Group

Office	Name	Affiliation
Chair	Andrei Moldoveanu	NEMA
NTEP Technical Advisor	Jeff Gibson	NCWM, NTEP Administrator
NIST Technical Advisor	Juana Williams	NIST, Office of Weights and Measures
Public Sector Members	Tom Buck	Ohio
	Alison Wilkinson	Maryland
	Jack Witt	California
Private Sector Members	Craig Denson	DENT Instruments
	William Hardy	Retired
	Michael Krauthamer	Alliance for Transportation Electrification
	Dave Parmelee	Control Module
	Ernesto Ventura	EVWM
	Francesca Wahl	Tesla

NTEP MDMD Work Group

Office	Name	Affiliation
Chair	Chris Senneff	Avery Weigh-Tronix
NTEP Technical Advisors	Jeff Gibson	NCWM, NTEP Administrator
NIST Technical Advisor	Loren Minnich	NIST , Office of Weights and Measures
Canadian Technical Advisors	Joshua Foster	Measurement Canada
	Pascal Turgeon	Measurement Canada
Public Sector Member	Tom Buck	Ohio
Private Sector Members	Sprague Ackley	Digimarc
	Jeff Cooper	National Motor Freight Traffic Association
	Rick Costa	Wingfield Scale Company
	Scott Davidson	Mettler-Toledo
	Brandi Harder	Rice Lake Weighing Systems
	Scott Henry	Zebra Technologies
	Robert Kennington	Cubiscan
	John Lawn	Rice Lake Weighing Systems
	Matt Miller	4DMobile
	Sameer Parmar	SICK
	Phil Peterson	SICK
	Tony Romeo	Datalogic
	Adrian Ruthe	Loadscan
	Michael Stutler	UPS
	Richard Suiter	Richard Suiter Consulting
	Matthew Walz	Walz Scale
	Scott Wiggington	UPS

Northeastern Weights and Measures Association (NEWMA)

www.newma.us

States	Connecticut Maine Massachusetts	New Hampshire New Jersey New York	Pennsylvania Puerto Rico Rhode Island	Vermont		
Contact	Steve Timar State of New York			845-437-5150 steve.timar@agriculture.ny.gov		
Annual Meeting	Warwick, Rhode Island			April 27 – 30, 2026		
Interim Meeting	Galloway, New Jersey			October 5 – 7, 2026		

Central Weights and Measures Association (CWMA)

www.cwma.net

States	Illinois Indiana Iowa	Kansas Michigan Minnesota	Missouri Nebraska North Dakota	Ohio South Dakota Wisconsin		
Contact	Sherry Turvey Kansas Department of Agriculture			785-564-6682 sherry.turvey@ks.gov		
Annual Meeting	Wichita, Kansas			April 20 – 23, 2026		
Interim Meeting	TBD			TBD		

Western Weights and Measures Association (WWMA)

www.westernwma.org

States	Alaska Arizona California	Colorado Hawaii Idaho	Montana Nevada New Mexico	Oregon Utah Washington	Wyoming	
Contact	Michael Brooks Arizona Department of Agriculture			602-920-4202 mbrooks@azda.gov		
Annual Meeting	TBD			TBD		

Southern Weights and Measures Association (SWMA)

www.swma.org

States	Alabama Arkansas Delaware	District of Columbia Florida Georgia	Kentucky Louisiana Maryland	Mississippi North Carolina Oklahoma	South Carolina Tennessee Texas	US Virgin Islands Virginia West Virginia
Contact	Valerie Forbes Delaware Department of Agriculture			302-698-4602 valerie.forbes@delaware.gov		
Annual Meeting	Atlanta, Georgia			October 24 – 29, 2026		

Past Chairmen

Annual Meeting	Year	Location	Chairman	Affiliation
1st	1905	Washington, D.C.	Dr. S.W. Stratton	National Bureau of Standards
2nd	1906	Washington, D.C.	Dr. S.W. Stratton	National Bureau of Standards
3rd	1907	Washington, D.C.	Dr. S.W. Stratton	National Bureau of Standards
4th	1908	Washington, D.C.	Dr. S.W. Stratton	National Bureau of Standards
	1909	Meeting Was Not Held		
5th	1910	Washington, D.C.	Dr. S.W. Stratton	National Bureau of Standards
6th	1911	Washington, D.C.	Dr. S.W. Stratton	National Bureau of Standards
7th	1912	Washington, D.C.	Dr. S.W. Stratton	National Bureau of Standards
8th	1913	Washington, D.C.	Dr. S.W. Stratton	National Bureau of Standards
9th	1914	Washington, D.C.	Dr. S.W. Stratton	National Bureau of Standards
10th	1915	Washington, D.C.	Dr. S.W. Stratton	National Bureau of Standards
11th	1916	Washington, D.C.	Dr. S.W. Stratton	National Bureau of Standards
	1917	Meeting Was Not Held		
	1918	Meeting Was Not Held		
12th	1919	Washington, D.C.	Dr. S.W. Stratton	National Bureau of Standards
13th	1920	Washington, D.C.	Dr. S.W. Stratton	National Bureau of Standards
14th	1921	Washington, D.C.	Dr. S.W. Stratton	National Bureau of Standards
15th	1922	Washington, D.C.	Dr. S.W. Stratton	National Bureau of Standards
16th	1923	Washington, D.C.	Dr. George Burgess	National Bureau of Standards
17th	1924	Washington, D.C.	Dr. George Burgess	National Bureau of Standards
18th	1925	Washington, D.C.	Dr. George Burgess	National Bureau of Standards
19th	1926	Washington, D.C.	Dr. George Burgess	National Bureau of Standards
20th	1927	Washington, D.C.	Dr. George Burgess	National Bureau of Standards
21st	1928	Washington, D.C.	Dr. George Burgess	National Bureau of Standards
22nd	1929	Washington, D.C.	Dr. George Burgess	National Bureau of Standards
23rd	1930	Washington, D.C.	Dr. George Burgess	National Bureau of Standards
24th	1931	Washington, D.C.	Dr. George Burgess	National Bureau of Standards
	1932	Meeting Was Not Held		
	1933	Meeting Was Not Held		
	1934	Meeting Was Not Held		
25th	1935	Washington, D.C.	Dr. Lyman Briggs	National Bureau of Standards
26th	1936	Washington, D.C.	Dr. Lyman Briggs	National Bureau of Standards
27th	1937	Washington, D.C.	Dr. Lyman Briggs	National Bureau of Standards
28th	1938	Washington, D.C.	Dr. Lyman Briggs	National Bureau of Standards
29th	1939	Washington, D.C.	Dr. Lyman Briggs	National Bureau of Standards
30th	1940	Washington, D.C.	Dr. Lyman Briggs	National Bureau of Standards
31st	1941	Washington, D.C.	Dr. Lyman Briggs	National Bureau of Standards
	1942	Meeting Was Not Held		
	1943	Meeting Was Not Held		
	1944	Meeting Was Not Held		
	1945	Meeting Was Not Held		
32nd	1946	Washington, D.C.	Dr. E.U. Condon	National Bureau of Standards
33rd	1947	Washington, D.C.	Dr. E.U. Condon	National Bureau of Standards
	1948	Meeting Was Not Held		
34th	1949	Washington, D.C.	Dr. E.U. Condon	National Bureau of Standards
35th	1950	Washington, D.C.	Dr. E.U. Condon	National Bureau of Standards
36th	1951	Washington, D.C.	Dr. E.U. Condon	National Bureau of Standards
37th	1952	Washington, D.C.	Dr. A.V. Astin	National Bureau of Standards
38th	1953	Washington, D.C.	Dr. A.V. Astin	National Bureau of Standards
39th	1954	Washington, D.C.	Dr. A.V. Astin	National Bureau of Standards

Past Chairmen

Annual Meeting	Year	Location	Chairman	Affiliation
40th	1955	Washington, D.C.	Dr. A.V. Astin	National Bureau of Standards
41st	1956	Washington, D.C.	Dr. A.V. Astin	National Bureau of Standards
42nd	1957	Washington, D.C.	Dr. A.V. Astin	National Bureau of Standards
43rd	1958	Washington, D.C.	J.P. McBride	Massachusetts
44th	1959	Washington, D.C.	C.M. Fuller	California
45th	1960	Washington, D.C.	H.E. Crawford	Florida
46th	1961	Washington, D.C.	R.E. Meek	Indiana
47th	1962	Washington, D.C.	Robert Williams	New York
48th	1963	Washington, D.C.	C.H. Stender	South Carolina
49th	1964	Washington, D.C.	D.M. Turnbull	Washington
50th	1965	Washington, D.C	V.D. Campbell	Ohio
51st	1966	Denver, CO	J.F. True	Kansas
52nd	1967	Washington, D.C.	J.E. Bowen	Massachusetts
53rd	1968	Washington, D.C.	C.C. Morgan	Indiana
54th	1969	Washington, D.C.	S.H. Christie	New Jersey
55th	1970	Salt Lake City, UT	R.W. Searles	Ohio
56th	1971	Washington, D.C.	M. Jenning	Tennessee
57th	1972	Washington, D.C.	E.H. Black	California
58th	1973	Minneapolis, MN	George Johnson	Kentucky
59th	1974	Washington, D.C.	John Lewis	Washington
60th	1975	San Diego, CA	Sydney Andrews	Florida
61st	1976	Washington, D.C.	Richard Thompson	Maryland
62nd	1977	Dallas, TX	Earl Prideaux	Colorado
63rd	1978	Washington, D.C.	James Lyles	Virginia
64th	1979	Portland, OR	Kendrick Simila	Oregon
65th	1980	Washington, D.C.	Charles Vincent	Texas
66th	1981	St. Louis, MO	Edward Stadolnik	Massachusetts
67th	1982	Atlanta, GA	Edward Heffron	Michigan
68th	1983	Sacramento, CA	Charles Greene	New Mexico
69th	1984	Boston, MA	Sam Hindsman	Arkansas
70th	1985	Washington, D.C.	Ezio Delfino	California
71st	1986	Albuquerque, NM	George Mattimoe	Hawaii
72nd	1987	Little Rock, AR	Frank Nagele	Michigan
73rd	1988	Grand Rapids, MI	Darrell Guensler	California
74th	1989	Seattle, WA	John Bartfai	New York
75th	1990	Washington, D.C.	Fred Gerk	New Mexico
76th	1991	Philadelphia, PA	N. David Smith	North Carolina
77th	1992	Nashville, TN	Sidney Colbrook	Illinois
78th	1993	Kansas City, MO	Allan Nelson	Connecticut
79th	1994	San Diego, CA	Thomas Geiler	Massachusetts
80th	1995	Portland, ME	James Truex	Ohio
81st	1996	New Orleans, LA	Charles Gardner	New York
82nd	1997	Chicago, IL	Barbara Bloch	California
83rd	1998	Portland, OR	Steven Malone	Nebraska
84th	1999	Burlington, VT	Aves Thompson	Alaska
85th	2000	Richmond, VA	Wes Diggs	Virginia
86th	2001	Washington, DC	Louis Straub	Maryland
87th	2002	Cincinnati, OH	Ronald Murdock	North Carolina
88th	2003	Sparks, NV	Ross Andersen	New York
89th	2004	Pittsburgh, PA	Dennis Ehrhart	Arizona

Past Chairmen

Annual Meeting	Year	Location	Chairman	Affiliation
90th	2005	Orlando, FL	Wes Diggs	Virginia
91st	2006	Chicago, IL	Don Onwiler	Nebraska
92nd	2007	Salt Lake City, UT	Michael Cleary	California
93rd	2008	Burlington, VT	Judy Cardin	Wisconsin
94th	2009	San Antonio, TX	Jack Kane	Montana
95th	2010	St. Paul, MN	Randy Jennings	Tennessee
96th	2011	Missoula, MT	Tim Tyson	Kansas
97th	2012	Portland, ME	Kurt Floren	California
98th	2013	Louisville, KY	Stephen Benjamin	North Carolina
99th	2014	Detroit, MI	John Gaccione	New York
100th	2015	Philadelphia, PA	Ronald Hayes	Missouri
101st	2016	Denver, CO	Jerry Buendel	Washington
102nd	2017	Pittsburgh, PA	Kristin Macey	California
103rd	2018	Tulsa, OK	James Cassidy	Massachusetts
104th	2019	Milwaukee, WI	Brett Gurney	Utah
105th	2020	Lansing, MI	Craig VanBuren	Michigan
106th	2021	Rochester, NY	Hal Prince	Florida
107th	2022	Tacoma, WA	Ivan Hankins	Iowa
108th	2023	Norfolk, VA	Mahesh Albuquerque	Colorado
109th	2024	Cleveland, OH	Gene Robertson	Mississippi
110th	2025	Reno, NV	Marc Paquette	Vermont

General Information

PURPOSE

NCWM meetings are held throughout the year to develop the national standards that are adopted by NCWM and published in *Handbooks 44*, *130*, and *133*. At the NCWM Interim Meeting, Committees will conduct Open Hearings where all attendees have a direct impact on the national standards through their testimony. Following Open Hearings, the Committees will convene in work sessions to consider testimony and all other information at their disposal to further develop agenda items and determine the status of each for the Annual Meeting in July. Committees will report these decisions at the Joint Committee Meeting on Wednesday. Items given voting status by the Committees will be presented at the NCWM Annual Meeting in July.

SUPPORTING DOCUMENTS

Additional letters, presentations and data may have been part of the Committee's consideration. Please refer to www.ncwm.com/publication-15 to review these documents.

ITEMS GROUPED INTO BLOCKS

The Committee may group related items into blocks to be considered as a group. This provides for more efficient open hearings and voting sessions since each item within a block is not presented individually.

FIRST TIME ATTENDEES

All attendees who are participating for the first time are encouraged to ask NCWM staff, Chairman, Board members and/or Committee members questions.

AGENDA

The subject matter listed on each Standing Committee's agenda will be open for discussion as noted. The Committee may also take up routine or miscellaneous items brought to its attention after the preparation of this document. The Committee may decide to accept items for discussion that are not listed in this document, providing they meet the criteria for exceptions as presented in *NCWM Policy 3.2.2. Procedures to Modify Handbooks, Part E, Exceptions to Policy for Submission of Items to the NCWM Committee Agenda; Submission of Priority Items*. The Committees have not determined whether the items presented will be Voting or Informational, Developing or Withdrawn in status for the Annual Meeting in July; these determinations will be made in their deliberations at the Interim Meeting.

The agendas:

- Shall include items brought to the attention of the Standing Committees prior to the submission deadline of August 15, 2025, and approved for inclusion in their agendas by the Committees; and
- Shall serve as the basis for the Standing Committee Interim Reports; to be printed in the program and Committee reports of *NCWM Publication 16, Committee Reports for the 111th Annual Meeting* to be held

July 26th-30th, 2026 at the Philadelphia Marriott Old City in Philadelphia, PA. The final reports of the Committees will be published following the 111th NCWM Annual Meeting in the *Annual Report of the 111th National Council on Weights and Measures*.

WRITTEN COMMENTS OR ORAL STATEMENTS

Any person or organization wanting to provide a formal presentation during a committee session should make the request in writing to the Executive Director. Reasonable limitations on time allotted for presentations will be imposed. *Note: Only registered attendees may make presentations.*

National Council on Weights and Measures
Attn: Don Onwiler, Executive Director
9011 South 83rd Street | Lincoln, Nebraska 68516
402-434-4880, don.onwiler@ncwm.com

JOINT MEETINGS FOR ALL COMMITTEES

A Joint Meeting for all Committees will be held:

- Sunday, January 11, 2026

PARTICIPATION

All sessions are open to registered attendees of the meeting. If a Committee must discuss any issue that involves proprietary information or other confidential material; that portion of the session dealing with the special issue may be closed provided that:

- NCWM Chairman or, in their absence, the Chairman-Elect approves;
- the Executive Director is notified, and
- an announcement of the closed meeting is posted on or near the door to the meeting session and at the registration desk.

If possible, the posting will be done at least a day prior to the planned closed session. Please note that a one-day notice will not be possible if a closed meeting is called on Sunday. Since participants may make their travel reservations in order to attend technical meetings scheduled for Sunday, every effort will be made to limit any required closed meetings to only part of Sunday.

REPORTS

There will not be a transcript made of the proceedings of NCWM Interim Meetings. Each Committee will prepare its report containing its recommendations based upon the presentations, discussions, and deliberations on all matters on its agenda that were addressed during the Interim Meeting. These reports will be published in *NCWM Publication 16, Committee Reports for the 111th Annual Meeting*, to be posted online at www.ncwm.com in early April. Printed copies of *NCWM Publication 16* will be distributed to meeting attendees at the NCWM Annual Meeting in July.

ANNUAL MEETING

The 111th NCWM Annual Meeting will be held at:

Philadelphia Marriott Old City | July 26th-30th, 2026

UNITS OF MEASUREMENT

In keeping with the provisions of the Omnibus Trade and Competitiveness Act of 1988, which establishes the metric system as the preferred system of measurement for commerce and trade, units of the metric system have been used in this document, except where industry has not yet converted from the inch-pound system. In some instances, submitted proposals quoted in the Committee agendas may appear in inch-pound units only.

2026 Interim Meeting Agenda
NCWM Board of Directors

Mr. Kevin Schnepp, NCWM Chairman
California

INTRODUCTION

The Board of Directors (hereinafter referred to as the "Board") will address the following items in Table A during the Interim Meeting. Table A identifies the agenda items by reference key, title of item, page number and the appendices by appendix designations. The first three letters of an item's reference key are assigned from the Subject Series List. The next 2 digits represent the year the item was introduced. The acronyms for organizations and technical terms used throughout the agenda are identified in Table B. In some cases, background information will be provided for an item. The fact that an item appears on the agenda does not mean it will be presented to the National Council on Weights and Measures (NCWM) for a vote. The Board will review its agenda and may withdraw some items, present some items for information meant for additional study, issue interpretations, or make specific recommendations for change to the publications identified, which will be presented for a vote at the Annual Meeting. The Board may also take up routine or miscellaneous items brought to its attention after the preparation of this document. The Board may decide to accept items for discussion that are not listed in this document, providing they meet the criteria for exceptions as presented in *NCWM Policy 3.1.4. Handbooks, Procedures to Modify Handbooks*. The Board has not determined whether the items presented will be Voting or Informational in nature; these determinations will result from their deliberations at the Interim Meeting.

Items may be grouped into “Blocks” if they are:

- **Opposing Items:** Items in direct conflict with each other, and only one may be adopted,
- **Interdependent Items:** Items addressing a similar topic where, if one is adopted, all need to be adopted, and
- **Related Items:** Items addressing a similar topic across multiple codes or regulations.

An "Item Under Consideration" is a statement of proposal and not necessarily a recommendation of the Board. Suggested revisions are shown in **bold face print** by ~~**striking out**~~ information to be deleted and **underlining** information to be added. Requirements that are proposed to be nonretroactive are printed in ***bold faced italics***. Additional letters, presentations and data may have been part of the committee's consideration. Please refer to www.ncwm.com/publication-15 to review these documents.

All sessions are open to registered attendees of the meeting. If the Board must discuss any issue that involves proprietary information or other confidential material; that portion of the session dealing with the special issue may be closed if (1) NCWM Chairman or, in their absence, NCWM Chairman-Elect approves; (2) the Executive Director is notified; and (3) an announcement of the closed meeting is posted on or near the door to the meeting session and at the registration table. If possible, the posting will be done at least a day prior to the planned closed session.

Note: It is policy to use metric units of measurement in publications; however, recommendations received by NCWM technical committees and regional weights and measures associations have been printed in this publication as submitted. Therefore, the report may contain references to inch-pound units.

Subject Series List

Table A
Table of Contents

Table B
Glossary of Acronyms and Terms

Acronym	Term	Acronym	Term
AMC	Associate Membership Committee	NTEP	National Type Evaluation Program
NCWM	National Council on Weights and Measures	OIML	International Organization of Legal Metrology
NIST	National Institute of Standards and Technology	OWM	Office of Weights and Measures

Details of All Items
(In order by Reference Key)

ACT – ACTIVITY REPORTS

ACT-1 I Membership

The chart and graph below show NCWM membership levels of recent years by membership categories. October 1 is the lowest level of membership for every fiscal year because it is the day that any memberships that were not renewed become lapsed. Significant growth is realized throughout the following 12 months as additional members return, and new members are received. The potential growth remains significant and NCWM continues to enhance programs and services that add value to membership.

Year / Type	Oct. 2017	Oct. 2018	Oct. 2019	Oct. 2020	Oct. 2021	Oct. 2022	Oct. 2023	Sept. 2024	Sept. 2025
Associate	658	643	636	607	608	609	573	720	607
Foreign Associate	68	70	79	77	91	86	76	110	82
Total Associate	**726**	**713**	**715**	**684**	**699**	**695**	**649**	**830**	**689**
State Government	615	739	744	614	698	644	564	722	626
Local Government	429	412	406	397	389	380	350	418	319
Total Active	**1044**	**1151**	**1150**	**1011**	**1087**	**1024**	**914**	**1140**	**945**
NIST	15	15	17	16	15	19	14	15	14
Other Federal Government	10	10	8	7	7	5	7	14	11
Foreign Government	13	14	14	13	13	14	15	19	17
Retired	223	225	235	241	245	248	353	185	140
Total Advisory	**261**	**264**	**274**	**277**	**280**	**286**	**389**	**233**	**182**
Grand Total	**2031**	**2128**	**2139**	**1972**	**2066**	**2008**	**1952**	**2203**	**1816**

ACT-2 I Meetings

Interim Meetings:

- January 11-14, 2026 Renaissance Mobile Riverview Plaza Hotel, Mobile, Alabama
- January 24-27, 2027 Sonesta Redondo Beach & Marina, Redondo Beach, California
- January 23-26, 2028 Biltmore Los Angeles, Los Angeles, California

Annual Meetings:

- July 26-30, 2026 111th Annual Meeting: Marriott Old City, Philadelphia, Pennsylvania
- July 11-15, 2027 112th Annual Meeting: Marriott Knoxville Downtown, Knoxville, Tennessee
- July 2028 Date and location to be determined in the Central Region

NCWM strives to plan meetings in locations that have reasonably priced airline service and are within government per diem rates. For more information about our meetings, contact Ms. Elisa Stritt, NCWM Director of Operations, at (402) 434-4872 or elisa.stritt@ncwm.com.

ACT-3 I Participation in International Standard-Setting

David Sefcik (NIST OWM) provided a report during the Open Hearings of the 2025 NCWM Annual Meeting. See Appendix A for a copy of the full report. The Board of Directors expresses appreciation to Mr. Sefcik for his report and the important efforts of the NIST, Office of Weights and Measures around the world.

See the NTEP Committee Agenda for additional reports on NCWM's involvement internationally, including the Mutual Recognition Arrangement (MRA) with Measurement Canada and the OIML Certificate System (CS).

ACT-4 I Associate Membership Committee Activity

AMC Committee Chair Bill Callaway provided the following report.

Hello Everyone!!! My time as the Chairman of the AMC committee is winding down. We will be selecting the next AMC team on Wednesday morning. I wanted to thank everyone on the AMC committee for their support & professionalism throughout the past several years.

I am happy to report that the Associate Membership Committee is doing well. As a reminder to everyone the AMC committee is comprised of industry representatives who make up approximately 40% of NCWM's total membership. AMC membership dues are slightly higher than Government Membership dues. The amount for Associate Member dues in excess of government member dues is deposited into a special AMC account to create the AMC Fund. The AMC fund is intended to be used for the purpose of funding Weights & Measures Training throughout the country. Any expenditure from this fund is at the authorization of the AMC and in accordance with the bylaws and policies.

To apply for AMC funds is easy. On the NCWM website under Associate Membership Committee download the application. Complete the application and send it to Don Onwiler. We will circulate the application to the AMC and vote on the funding of the application.

Some criteria for funding selection are as follows:

- The application is thoroughly completed with all the information the AMC needs to make a decision.
- Training requests that benefits a higher number of participants are generally preferred over those for fewer or single-person benefit. Multi-state training that encourages uniformity will also be given priority consideration.
- In general, attending meetings will not be considered training, especially requests for travel expense or attendance fees for NCWM Annual, Interim or Regional meetings. Food & beverage expenses is not considered a training activity that the AMC will Fund.
- As a lower priority, requests for the purchase of training materials will be considered, but requests for purchase of assets (such as LCD projectors) will not.

- Reasonable funding for travel and expenses will be considered if it is necessary to acquire an "expert trainer" that would benefit a high number of Weights and Measures Officials. This will be an option when qualified volunteers are not available.

The following is a summary of the training the AMC Committee has funded over the past 12 months.

- Connecticut – Financial contribution to help fund a Lab Metrology Mentoring Program. The goal is to assist with new lab set up and/or continuing education for existing staff in the amount of $3,500 for ~30 participants.
- Colorado - In-person small-scale training for new hires, management staff and refresher for advanced inspectors. The course is a joint training with staff from the New Mexico Department of Agriculture and Colorado Department of Agriculture in the amount of $2,000 for 30 participants.
- New York – Provide a weeklong training school covering multiple topics, to include: NIST EPOs, updates to NCWM Handbooks, petroleum quality, package checking, and safety issues. This school is open to all NYSWMA members, inspectors from surrounding states as well as representatives from NCWM and NIST in the amount of $5,000 for 70+ participants.
- Wisconsin - These funds will be used to have a NIST certified trainer attend and present a one day training on small capacity scales, specifically retail computing scales, at the Wisconsin Weights and Measures Association Annual Meeting in 2025 in the amount of $3,000 for 60 participants.
- Illinois – NIST Vehicle Tank Meters & Loading Rack Training in the amount of $4,000 for ~ 25 inspectors.
- Montana – Large Scale Inspection, Test & Certification Course in the amount of $5,995 for 25 participants.

I am happy to report that the AMC Committee has approved ~ $23,495 to be used for training ~ 240 approximately participants.

Special thanks to the AMC committee for your hard work as well as to the employers of the AMC committee participants for allocating the resources for you to participate in the NCWM.

ACT-5 I Task Groups, Subcommittees, Steering Committees

Task Groups, Subcommittees, Steering Committees:
Focus groups, task groups, subcommittees, and steering committees are created by the NCWM Chairman and operate as defined in NCWM Policy 1.5.1. Subgroups Supporting the Work of the Organization. A task group is given a specific charge, and it reports to the appropriate NCWM standing committee. A task group will disband after completing its assignment. A subcommittee is charged with ongoing responsibilities in support of a standing committee in a specific field of expertise. A steering committee is charged with unbiased fact-finding that will assist NCWM membership in decision processes for difficult issues. A steering committee will disband upon completion of its specific charge.

NCWM offers resources to these task groups and subcommittees including meeting space at Interim and Annual Meetings, conference calling and web meeting services, group email services, a dedicated web page for posting and archiving documents related to their work, and broadcast e-mail services to reach targeted audiences. Additionally, NIST OWM has provided technical advisors and web meeting forums. These tools enable year-round progress of task group and subcommittee work.

Because NCWM task groups and subcommittees are part of the NCWM organizational structure and report directly to its standing committees, their proposals may appear in *NCWM Publication 15* without first being vetted through a regional association. NCWM vets any such proposals through the open hearings of NCWM.

Current task groups and subcommittees are listed here.

Reporting to the Board of Directors:

Cannabis Task Group:
Chair: Mr. Charles Rutherford
612-655-5494, charlie@cprsquaredinc.com

Policy and Bylaw Review Task Group
Chair: Mr. Chris Guay
513-652-6597, guay.cb@gmail.com

EVSE Training Planning Committee
Chair: Mahesh Albuquerque
303-318-8502, mahesh.albuquerque@state.co.us

EVSE Task Group
Chair: Kevin Schnepp
916-229-3458, kevin.schnepp@cdfa.ca.gov

NCWM Standards Development Task Group
Chair: Jason Flint
973-420-8915, flintj@dca.njoag.gov

Reporting to the Laws and Regulations Committee:

Fuels and Lubricants Subcommittee
Chair: Vanessa Benchea
813-868-8263, Vanessa.Benchea@fdacs.gov

Packaging and Labeling Subcommittee
Chair: Mr. Chris Guay
513-652-6597, guay.cb@gmail.com

Uniform Shipment Law Task Group
Chair: Miland Kofford
801-538-7158, mkofford@utah.gov

Moisture Allowance Task Group
Chair: Tory Brewer
304-722-0602, tory.d.brewer@wv.gov

Reporting to the Specifications and Tolerances Committee:

Milk Meter Tolerance Task Group
Chair: Mr. Aaron Yanker
719-250-1851, aaron.yanker@state.co.us

Verification Scale Division (e) Task Group
Chair: Evan Foisy
631-560-3497, EFoisy@andonline.com

Transportation-for-Hire Systems Task Group
Chair: Mark Lovisa
225-925-3780, mlovisa@ldaf.state.la.us

Reporting to the Professional Development Committee:

Safety Subcommittee
Chair: John Satterlee
217-785-8480, john.satterlee@illinois.gov

Women in Weights and Measures Subcommittee
Chair: Cheryl Ayer
303-318-8502, cheryl.e.ayer@agr.nh.gov

Metrology Subcommittee
Chair: Frank Greene
860-713-7237, frank.greene@ct.gov

Member Education and Mentorship Subcommittee
Chair: Brian Fuller
515-201-5413, Brian.Fuller@IowaAgriculture.gov

Fraud Prevention and Education Task Group
Chair: Alan Walker
805-274-9044, alan.walker@FDACS.gov

ACT-6 I Regional Association Activities

2026 Meetings

NEWMA Annual Meeting
April 27-30, 2026
Location Warwick, Rhode Island
Contact: Mr. Steve Timar, steve.timar@agriculture.ny.gov

NEWMA Interim Meeting
October 5-7, 2026
Location Galloway, New Jersey
Contact: Mr. Steve Timar, steve.timar@agriculture.ny.gov

CWMA Annual Meeting
April 20-23, 2026
Wichita, Kansas
Contact: Ms. Sherry Turvey, Sherry.Turvey@ks.gov

WWMA Annual Meeting
TBD
TBD
Contact: Mr. Michael Brooks, mbrooks@azda.gov

SWMA Annual Meeting
October 24-29, 2026
Atlanta, Georgia
Contact: Valerie Forbes, valerie.forbes@delaware.gov

SPB – STRATEGIC PLANNING, POLICIES, AND BYLAWS

SPB-24.1 I Electronic Publications 15 & 16

Source:
Board of Directors

Purpose:
Get membership feedback on eliminating printed copies of Publications 15 & 16.

Item under Consideration:
NCWM offers Publications 15 and 16, the Interim and Annual Meetings agendas, in two formats. They are available as downloads from the NCWM website and provided as printed books at the meetings. NCWM is gradually reducing the number of printed copies, and will discontinue printing them in 2027. Attendees will continue to have access to the publications in PDF format from the NCWM website, and NCWM will provide adequate power supply throughout the ballroom for electronic devices.

Previous Action:
New in 2024

Original Justification:
Society has become less dependent on paper by recognizing the advantages of electronic files. They provide easy word searches and links from a table of contents to a specific item in the file. By eliminating printed books, NCWM would provide a positive environmental impact while realizing cost savings from printing and shipping hundreds of large books twice yearly.

Recognizing the need for electronic devices, NCWM would include access to power supplies throughout the meeting rooms.

Item Development:
2025 Annual Meeting: Very limited printed copies of Publications 15 and 16 will be available in 2026. NCWM will discontinue printing these publications in 2027.

2025 NCWM Interim Meeting: Staff has reduced the number of books published based on the demand of previous meetings. NCWM will continue assessing the demand while the board encourages attendees to move toward viewing on their electronic devices.

SPB-26.1 Article X – Voting System

Source:
NCWM Policy and Bylaws Review Task Group

Purpose:
Clarify the process for amending the reports.

Item under Consideration:
Amend the NCWM Bylaws as follows:

Article X - Voting System

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SECTION 6 - COMMITTEE AND BOARD OF DIRECTORS REPORTS

Alternatives that may be used in voting on the reports:

A. vote on the entire report at once,

B. Vote on the report by separate and distinct parts which can be done by a

1. vote on grouped items or sections, and/or
2. vote on individual items; according to
   a. committee discretion,
   b. on request by a registered attendee, or
3. vote to adopt the remainder of the report after having voted on the individual items within the report.

Once a vote on an individual item, grouped item(s) or section(s) is completed that result will stand ~~unless there is a successful action to reconsider a specific vote per Roberts Rules,~~ **and cannot be recalled for another vote at the same Annual Meeting.**

SECTION 7 - AMENDMENTS ~~AND CHANGES~~

A. Technical Items

~~1. Changes~~
~~Committee chairs~~ **A committee** may ~~offer changes to their final reports on the day of voting~~ **amend the classification or the proposed text of an item in its report until there is a call for the vote on that item**.

~~2.Amendments~~

Substantive amendments ~~can be made at the request of~~ **to the classification or the proposed text can be proposed from the floor by** weights and measures officials only, and:

a. ~~a~~ **A**-majority of the voting delegates of the House of State Representatives and the House of Delegates must vote favorably before a proposed amendment can be accepted for debate.
b. A two-thirds favorable vote of the House of State Representatives and the House of Delegates on the amendment is required for passage (the requirement for a minimum vote of 27 in each House also applies).

B. Business Items

~~1. Changes~~
~~Committee or Board members~~ **The Board of Directors** may ~~offer editorial changes to their final reports on the day of voting~~ **amend the classification or the proposed text of an item in their report until there is a call for the vote on the item**.

~~**2.Amendments**~~

Substantive amendments ~~**can be made at the request of**~~ **to the classification or the proposed text can be proposed from the floor by** any member, and:

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

b. ~~**a**~~ **A** two-thirds favorable vote of each House on the amendment is required for passage (the requirement for a minimum vote of 27 in all three Houses also applies).

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SECTION 9A - VOTING - TECHNICAL ISSUES

Only members of the House of Delegates and the House of State Representatives will vote on the technical questions before the Corporation. At the conclusion of debate (if authorized) on a motion, there shall be a call for the vote by voice vote, a show of hands, standing, or electronic count. The requirements for minimum votes in a house are found in Article X, Section 4.

A. Motion Accepted If:

1. the majority of the House of State Representatives casts the required minimum votes in favor of the item

And

2. the majority of the House of Delegates casts the minimum required votes in favor of the item or the House of Delegates fails to cast the minimum required votes in opposition to the item.

B. Motion Rejected If:

1. the majority of the House of State Representatives casts the minimum required votes in opposition of the item

And

2. the majority of the House of Delegates casts the minimum required votes in opposition of the item or the House of Delegates fails to cast the minimum required votes in favor of the item.

C. Issue Returned to Committee for Future Consideration If:

1. The House of Representatives fails to cast the minimum required votes.
2. The minimum required votes is cast in each house but one house votes yea and the other house votes nay.

Or

3. Either the House of Representatives or House of Delegates casts a tie vote of 27 votes or more each in favor and in opposition to the item.

~~**The issue cannot be recalled for another vote at the same Annual Meeting.**~~

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SECTION 9B - VOTING - BUSINESS ISSUES

All members of the Corporation, including Associate Members, will vote on all business issues before the Corporation. At the conclusion of debate (if authorized) on a motion, there shall be a call for the vote by voice vote. In the event that a voice vote is too close to be determined in the opinion of the Chair, there shall be a show of hands, standing vote, or machine (electronic) vote count. There is no minimum voting requirement for any house to conduct business on issues.

A. Motion Accepted If:

1. a majority of those members present and voting vote Yea.

B. Motion Rejected If:

1. a majority of those members present and voting vote Nay.

C. Tie Vote:

1. In the case of a tie vote, the vote of the Chair shall prevail.

SECTION 10 - PROCEDURES

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

Previous Status:
2026: New Proposal

Original Justification:
The NCWM Policy and Bylaws Review Task Group reports to the Board of Directors. The task Group has recognized some ambiguity in the bylaws regarding the procedures to amend items on the agendas of committees and the board. This leaves interpretation to the parliamentarian. The changes proposed by the task group aim to clarify the process outlined in the bylaws, thereby avoiding scrutiny in the parliamentarian's instructions.

Comments in Favor:

Regulatory:
•

Industry:
•

Advisory:
•

Comments Against:

Regulatory:
•

Industry:
-

Advisory:
-

Neutral Comments:

Regulatory:
-

Industry:
-

Advisory:
-

Item Development:
New Proposal

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents.

FIN – FINANCIAL

FIN-26.1 Associate Membership Dues

Source:
Seraphin Test Measure

Purpose:
Provide additional funds for the Associate Membership Committee (AMC) to support training for weights and measures programs.

Item under Consideration:

Increase Associate Member dues from $115 to $140.

Previous Status:
New proposal

Original Justification:
The Associate Membership Committee discussed AMC funds that are available for training at the 2025 NCWM Annual Meeting. Recently the AMC has received requests that have exceeded the available funds and have had to reduce or deny the requested amount. After discussion, the AMC voted on and approved that it request to the NCWM Board of Directors that it raise Associate Member dues from $115 to $140. This would provide the Associate Member Committee with approximately $20,000 per year of additional funding for training support.

The submitter acknowledges that the $25 increase in dues could be a burden to some Associate Members.

The increase of dues would be a vote of the Board of Directors as provided for in the NCWM Bylaws, **Article IV, Section 1 – Fee.**

Comments in Favor:

Regulatory:
•

Industry:
•

Advisory:
•

Comments Against:

Regulatory:
•

Industry:
•

Advisory:
•

Neutral Comments:

Regulatory:
•

Industry:
•

Advisory:
•

Item Development:
New Proposal

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents.

FIN-1 I Treasurer's Report

Overall, NCWM's financial health is strong and there are no concerns. NCWM has self-funded the startup of its NTEP laboratory without incurring debt. All financial transactions and balances have been properly recorded and reported, and our internal controls, including the annual audit by Dana F. Cole & Company completed in December 2024, are effective in ensuring the accuracy and reliability of the financial information. Our financial statements accurately reflect NCWM's financial position and performance. We have sufficient liquidity to meet our current and future obligations, and financial performance is in line with expectations based on the current market. There are no immediate risks or areas of concern that require attention. I recommend continuing to monitor NCWM's financial performance and taking proactive measures to ensure its long-term financial stability.

Respectfully submitted by Mahesh Albuquerque, Treasurer.

ASSETS	September 30, 2024	September 30, 2025

Current Assets	$	$
Checking/Savings		
Associate Member Fund	36,660.32	18,975.61
Certificates of Deposit	427,081.31	274,278.41
Equities	987,320.75	1,136,077.80
Money Market Fund	175,832.57	152,921.34
Checking	113,942.57	33,838.03
Savings	11,022.86	11,050.44
Total Checking/Savings	1,751,860.38	1,627,141.66
Accounts Receivable	12,038.83	56,415.81
Other Current Assets	206,570.42	573,041.32
Fixed Assets	7,015.48	13,642.32
Other Assets	452,830.99	471,181.05
TOTAL ASSETS	**2,430,316.10**	**2,741,422.16**
LIABILITIES & EQUITY		
Liabilities		
Current Liabilities	582,848.06	622,683.34
Total Liabilities	582,848.06	622,683.34
Equity		
Designated - Associate Membership	55,174.62	18,972.44
Unrestricted Net Assets	1,574,919.61	1,829,139.07
Net Income	217,373.81	270,627.31
Total Equity	1,847,468.04	2,118,738.82
TOTAL LIABILITIES & EQUITY	**2,430,316.10**	**2,741,422.16**

1

Kevin Schnepp, California | NCWM Chairman
Jason Flint, New Jersey | NCWM Chairman-Elect
Marc Paquette, Vermont | NTEP Committee Chair
Mahesh Albuquerque, Colorado | Treasurer
Daniel Walker, Ohio | Active Membership - Central
James Willis, New York | Active Membership – Northeastern
Paul Floyd, Louisiana | Active Membership - Southern
Bill Striejewske, Nevada | Active Membership - Western
Matt Curran, Florida | At-Large
Jason Glass, Kentucky | At-Large
Ray Johnson, Fairbanks Scales | AMC Representative

Don Onwiler, NCWM | Executive Director
Katrice Lippa, NIST, OWM | Executive Secretary
Erica Garnier, Measurement Canada | Advisor
Jeff Gibson, NCWM | NTEP Administrator

Board of Directors

Appendix A

Report of the Activities of the International Organization of Legal Metrology (OIML) and Regional Legal Metrology Organizations

National Institute of Standards and Technology (NIST), Office of Weights and Measures (OWM)

OIML Electricity Metering Projects

Results from the March 2025 Technical Committee (TC) Meetings:

R46:2012 "Electrical Energy Meters"

- Updated test procedures, bidirectional measurement, remote displays, changing net configuration (electrical disturbances from wind turbines, etc.)

OIML G22 "Electric Vehicle Supply Equipment (EVSE)"

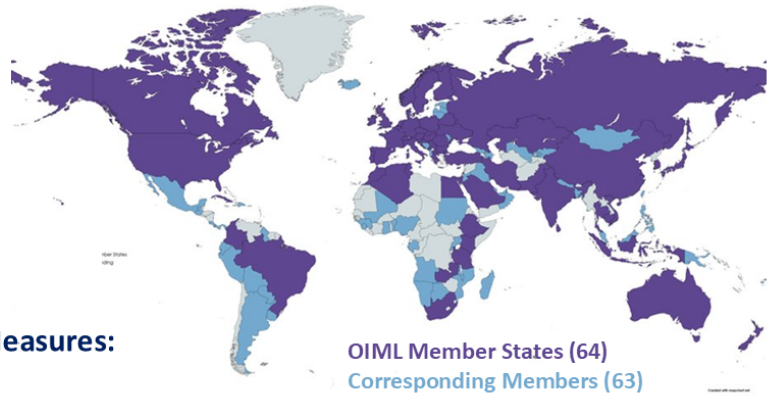
- **U.S. has proposed to add a section on field verification procedures based on NIST Handbook 44 (3.40)**
- Guide 22 to a full OIML Recommendation in 2026

New project in 2024: "DC Electricity Meters"

- DC applications are growing (solar panels, DC EVSE, battery units in grid storage)
- **Project initiated and led by the U.S. (NIST OWM)**

Promoting U.S. Manufacturers in International Markets

OIML G 22
Edition 2022 (E)
Electric Vehicle Supply Equipment



Technical Issues currently NOT considered by U.S. Weights and Measures:

- Separately certified meters
- Bidirectional: charging and vehicle-to-grid energy transfers
- Software requirements: protection and updates

Measurements of Fuel and Other Liquids

NIST

OIML Recommendation revisions underway

R 71 Fixed Storage Tanks
R 85 Automatic Level Gauges

OWM is shifting staff resources to maintain R 71/R 85 convenorship

OWM and the Netherlands on R 117 "Dynamic measuring systems for liquids other than water"

Weighing Systems in OIML TC9

NIST

Source: Rice Lake Weighing Systems

OIML Recommendations in "active" revision status:

- R 51 Catchweighers
- R 134 Weigh-in-Motion (WIM) Systems
- R 76 Non-automatic weighing Instruments (NAWI)

NAWI Focus Areas: electronic scales (vs mechanical), remote verification, and software security

OIML Digitalization Efforts

Smart Standards (OIML Digital Task Group)

- Migrating OIML Recommendations to digitalized forms (XML format) that are machine-readable and eventually machine-interpretable
- **Supports interoperable regulations and conformity assessments**

Digital Quality Infrastructure

- Digital Calibration Certificates (DCCs) for Scales/NAWIs
- All-Inclusive Digital Product Passports (EU-driven)
- **More efficient, reliable data available to support measuring instrument/device inspections**

NIST OWM's goal is to include U.S. Weights and Measures Community in this effort…

NIST

Thank You!

Feel free to contact any of us for more information:

katrice.lippa@nist.gov
katya.delak@nist.gov
jan.konijnenburg @nist.gov
michael.nelson@nist.gov

General/Technical Inquiries: owm@nist.gov

National Council on Weights & Measures
Associate Membership Committee Meeting Notes
110th Annual Meeting
Wednesday, July 16, 2025
Reno, NV

Call to Order: Chair Bill Callaway called the meeting to order.

Minutes from last meeting: The Committee reviewed and approved the minutes of the previous meeting from January 2025.

Elections: Per the bylaws elections for next committee members are held annually. These are one-year terms with rotation or succession upward to chair each year, unless determined otherwise. The election results were as follows.

- Chair Jim Pettinato
- Vice-chair Brent Price
- Secretary-treasurer Reid Wagner

At least 5 members (up to 10) are nominated to review proposals. The list includes the three officer positions. Some members were added, and the list now includes:

- Bill Calloway
- Jim Pettinato
- Brent Price
- Reid Wagner
- Bob Murnane
- Prentiss Searles
- David Boykin
- Perry Lawton
- Chris Wagner

Ray Johnson is the appointed AMC representative for the BOD.

Financial Report: A financial statement was distributed to the attendees. In summary, the account balance as of July 1, 2025, was $30232. There are payments pending of $11123, resulting in a net balance of $19109.

There is one request not yet approved for Louisiana EVSE and package inspection training.

Bill Callaway reviewed the criteria for requests of AMC funds to the members present.

NCWM Committee Reports:

BOD: Chris Guay provided the BOD update. Chris is retiring and Ray Johnson is taking over as the Associate member on the BOD.

- EVSE training next month in Denver with a few openings left
- The new NCWM office and lab grand opening was in June 2025 in Lincoln NE

L&R: Brent Price reported no major changes from statuses of items from interim meeting.

PDC: Perry Lawton reported as noted above that the EVSE training is upcoming, and NIST will possibly roll out other EVSE material/training in the future.

Old Business

- Montana large scale course and NIST VTM loading race training applications were approved.
- The Louisiana AMC fund application was rejected by the group because the request was for food and beverage. They (LA) were not going to modify the request, so no further activity on this item.

New Business

- Increasing AMC dues was discussed. Our AMC membership is approximately 800 members, and currently $15 is collected from each annual membership for the AMC.
- Bob Murnane in writing had suggested that we collect additional funds, as we have been short and denied some requests. Also, the existing $15 extra in dues has been in effect a long time.
- Chris Wagner provided a review of past years spendings and expressed concern that we could easily have a shortfall of funds and resulting rejection of funding request based on recent expenditures. If we reject requests for insufficient funds, then future requests will diminish. We perhaps should keep a safety reserve amount in the account, for example one full year of funds in reserve. He proposed increasing the dues and stated that the annual membership fee to NCWM was very reasonable as compared to other trade membership organizations.
- It was decided to increase the annual associate membership from $115 to $140 effective fall 2026. Bob Murnane will submit a Form 15 request for this change.

Additional comments and discussions

- Chuck Corr asked that if anyone has inputs for member education and mentorship group
    - one suggestion is that in the breakout sessions have the committee introduce themselves
- David Boykin says it's a good experience for AMC members to participate in development of RSA exams, and the contact is Jerry Buendel for exams.
- Don Onwiler says that folks should take or need to take the HB 44 training exam first to improve passing rates for RSA exams.
- Bill Callaway stated that it is in the best interest with RSA exams if we get the states to reciprocate between state to state. Scott Simmons says we need encouragement for states to adopt, and this will elevate HB44.
- Comment was that Industry (AMC members) needs to tell the story of innovations for the regulators, on new methods and technology, and to gain trust (example was QR code for EVSE).
- Don Onwiler stated that 14 states accept RSA, but most do not mandate the NCWM test, working on this to get other states on board.
- Scott Simmons mentioned that NIST has HB44 self-study preparation, and it is great preparation for taking any of these exams
- David Boykin said that his company NCR has a SharePoint site that references the NIST HB44 preparation.
- Richard Suiter commented that some states need education, and that training and focus on safety are key elements, and there is a need for retention of employees. Maybe AMC can be working on education programs.
- Mahesh Albuquerque stated that the EVSE training in August is still looking for sponsors.

The meeting was adjourned ~ 9:00 am

2026 Interim Meeting Agenda
Laws and Regulations (L&R) Committee

Mauricio Mejia, Committee Chair
Florida

INTRODUCTION

The L&R Committee will address the following items in Table A during the Interim Meeting. Table A identifies the agenda items by reference key, title of item, page number and the appendices by appendix designations. The headings and subjects apply to *Handbook 130, Uniform Laws and Regulations in the Areas of Legal Metrology an Engine Fuel Quality, 2026 Edition*, and *Handbook 133, Checking the Net Contents of Packaged Goods, 2026 Edition*. The first three letters of an item's reference key are assigned from the Subject Series List. The next 2 digits represent the year the item was introduced. The acronyms for organizations and technical terms used throughout the agenda are identified in Table B. In some cases, background information will be provided for an item. The fact that an item appears on the agenda does not mean it will be presented to the National Council on Weights and Measures (NCWM) for a vote. The Committee will review its agenda and may withdraw some items, present some items for information meant for additional study, issue interpretations, or make specific recommendations for change to the publications identified, which will be presented for a vote at the Annual Meeting. The Committee may also take up routine or miscellaneous items brought to its attention after the preparation of this document. The Committee may decide to accept items for discussion that are not listed in this document, providing they meet the criteria for exceptions as presented in *NCWM Policy 3.1.4. Handbooks, Procedures to Modify Handbooks*. The Committee has not determined whether the items presented will be voting, informational, assigned for further development, or withdrawn; these determinations will result from their deliberations at the Interim Meeting.

Items may be grouped into "Blocks" if they are:

- **Opposing Items:** Items in direct conflict with each other, and only one may be adopted,
- **Interdependent Items:** Items addressing a similar topic where, if one is adopted, all need to be adopted, and
- **Related Items:** Items addressing a similar topic across multiple codes or regulations.

An "Item Under Consideration" is a statement of proposal and not necessarily a recommendation of the Committee. Suggested revisions are shown in **bold face print** by ~~**striking out**~~ information to be deleted and **underlining** information to be added. Requirements that are proposed to be nonretroactive are printed in ***bold faced italics***. Additional letters, presentations and data may have been part of the committee's consideration. Please refer to www.ncwm.com/publication-15 to review these documents.

In some cases, there may be proposed changes affecting multiple model laws or regulations that share the same purpose or proposed changes to one model law or regulation may be dependent on the adoption of proposed changes to another. The Committee may group such items into "Blocks" to facilitate efficient handling for open hearings and voting. These blocks are identified in Committee's agenda.

All sessions are open to registered attendees of the meeting. If the Committee must discuss any issue that involves proprietary information or other confidential material; that portion of the session dealing with the special issue may be closed if (1) NCWM Chairman or, in their absence, NCWM Chairman-Elect approves; (2) the Executive Director is notified; and (3) an announcement of the closed meeting is posted on or near the door to the meeting session and at the registration table. If possible, the posting will be done at least a day prior to the planned closed session.

Note: The policy of NIST is to use metric units of measurement in all its publications; however, recommendations received by NCWM technical committees and regional weights and measures associations have been printed in this publication as submitted. Therefore, the report may contain references to U.S. customary units.

Subject Series List

Table A
Table of Contents

Table B
Glossary of Acronyms and Terms

Acronym	Term	Acronym	Term
ASTM	ASTM International	NEWMA	Northeastern Weights and Measures Association
API	American Petroleum Institute	NIST	National Institute of Standards and Technology
CFR	Code of Federal Regulations	NCWM	National Council on Weights and Measures
CWMA	Central Weights and Measures Association	OWM	Office of Weights and Measures
FALS	Fuels and Lubricants Subcommittee	PALS	Packaging and Labeling Subcommittee
FDA	Food and Drug Administration	S&T	Specifications and Tolerances
FTC	Federal Trade Commission	SAE	SAE International
HB	Handbook	SWMA	Southern Weights and Measures Association
ILMA	Independent Lubricant Manufacturers Association	UPLR	Uniform Packaging and Labeling Regulation
L&R	Laws and Regulations	USDA – FSIS	U.S. Department of Agriculture – Food Safety and Inspection Service
LPG	Liquefied Petroleum Gas	USNWG	U.S. National Work Group
MAV	Maximum Allowable Variation	WWMA	Western Weights and Measures Association

Details of All Items
(In order by Reference Key)

PAL – UNIFORM PACKAGING AND LABELING REGULATION

PAL-26.1 6.3. Net Quantity.

Source:
CPR Squared

Purpose:
To enhance consumer safety and reduce the financial burden of product recalls by mandating dynamic QR codes unique to each production batch on consumer package labels. Currently, inadequate batch-specific labeling leads to broader, costlier recalls, with an average direct cost of $10 million per food recall and approximately $7 billion in annual U.S. economic losses due to foodborne outbreaks. These inefficiencies expose consumers to heightened health risks, with 48 million annual foodborne illness cases, 128,000 hospitalizations, and 3,000 deaths. Dynamic QR codes enable precise tracking, targeted recalls, and real-time safety information access, minimizing health risks, reducing unnecessary product waste, and lowering economic losses for businesses and consumers.

Item under Consideration:
Amend NIST Handbook 130 Uniform Packaging and Labeling Regulation as follows:

6.3. Net Quantity. – A declaration of net quantity of the commodity in the package, exclusive of wrappers and any other material packed with such commodity (except as noted in Section 10.3. Aerosols and Other Pre-pressurized Containers Dispensing Product Under Pressure), shall appear on the principal display panel of a consumer package and, unless otherwise specified in this regulation (see Sections 6.6. Prescribed Units, SI, through 6.9. Bi-dimensional Commodities), shall be in terms of the largest whole unit.

6.3.1. Use of "Net Mass" or "Net Weight." – When stating the net quantity of contents in terms of weight a quantity declaration may stand alone [e.g., "200 g (7 oz)" or "1 lb (453 g)"] or may include the term "net mass" or "net weight" either preceding or following the declaration. The term "net" by itself may be used on food labels. However, the quantity of contents shall always declare the net quantity of contents even when such terms are not used.
(Amended 1993)

6.3.2. Use of "Net Contents". – When stating the net quantity of contents in terms of fluid measure or numerical count, a quantity declaration may stand alone [e.g., "177 mL (6 fl oz)"] or may include the term "net" or "net contents" either preceding or following the declaration.
(Amended 2019)

6.3.3. Lines of Print or Type. – A declaration of quantity may appear on one or more lines of print or type.
(Amended 1982)

6.3.X Dynamic QR Code –

(a) Requirement: All food and beverage consumer packages subject to this regulation shall include a dynamic QR code unique to each production batch on the label. The dynamic QR code shall link to a secure, updatable digital platform providing real-time information on product safety, recall status, and traceability details, compliant with ISO/IEC 18004 standards.

(b) Content: The digital platform accessible via the dynamic QR code shall include, at minimum:

1. **Batch identification number.**

2. Production and expiration dates.

3. Recall status, if applicable, including details of any safety alerts or corrective actions specific to food safety (e.g., contamination, allergen mislabeling).

4. Contact information for the manufacturer or responsible entity.

5. Traceability data, such as the source of ingredients or production facility, where relevant to food safety.

(c) Accessibility: To ensure inclusivity, food and beverage packages shall also display the batch identification number in human-readable form and provide a toll-free telephone number or website URL as alternative methods to access the information specified in paragraph (b).

(d) Security: Dynamic QR codes shall incorporate encrypted links and cryptographic signatures to prevent unauthorized access, tampering, or fraudulent redirects, adhering to industry-standard cybersecurity protocols.

(e) Implementation: This requirement shall apply to all food and beverage consumer packages produced on or after January 1, 2027, to allow sufficient time for manufacturers to adapt labeling processes and establish digital infrastructure.

(f) Exemptions: Food and beverage consumer packages exempt from this requirement include those with a net weight or volume less than 10 grams or 10 milliliters, or as otherwise determined by the National Conference on Weights and Measures, where labeling space constraints render compliance impractical.

Previous Status:

New Proposal

Original Justification:

Current labeling practices often use generic information that does not distinguish between batches, complicating recalls and exposing consumers to unnecessary dangers. Dynamic QR codes per batch provide a secure, updatable mechanism for tracking products from production to consumption, enabling swift, targeted recalls for specific batches (e.g., due to contamination or mislabeling). This approach reduces the scope of recalls, prevents widespread panic, minimizes economic losses, and empowers consumers with instant access to safety information via their smartphones, fostering greater trust and protection. Nationally, this addresses inconsistencies in recall efficiency across states and aligns with federal initiatives for food safety and traceability, such as those from the FDA.

Concern: Mandating dynamic QR codes increases costs for manufacturers, especially small businesses, due to labeling and database maintenance expenses.

Rebuttal: Many food and beverage products already include voluntary QR codes, so switching to dynamic QR codes is a simple change that leverages existing infrastructure. Affordable platforms exist for about $50/month.

Concern: Consumers without smartphones or internet access may be unable to scan QR codes, limiting accessibility.

Rebuttal: Voluntary QR codes are already common, and dynamic QR codes can include printed batch numbers or toll-free lines as alternatives, ensuring inclusivity while improving safety.

Concern: Dynamic QR codes are vulnerable to hacking, risking consumer data or fraudulent redirects.

Rebuttal: Many food and beverage products use voluntary QR codes securely; dynamic QR codes with ISO/IEC 18004 standards and encrypted links enhance safety, with audits preventing cyber risks.

Concern: Adding dynamic QR codes complicates labeling, potentially confusing consumers or cluttering packaging.

Rebuttal: Since many food and beverage products already feature voluntary QR codes, switching to dynamic ones is a minor adjustment that integrates seamlessly, enhancing safety with clear instructions.

Concern: Small manufacturers lack expertise to implement dynamic QR code systems.

Rebuttal: Voluntary QR codes are already widely used; transitioning to dynamic codes is straightforward with user-friendly platforms and NCWM support, boosting consumer safety.

Concern: QR code scanning may fail in areas with poor internet, hindering safety information access.

Rebuttal: Many food and beverage products use voluntary QR codes effectively; dynamic codes can include offtine-readable data, and infrastructure improvements ensure broader safety benefits.

Concern: Mandating QR codes may reduce reliance on traditional safety communication methods.

Rebuttal: Voluntary QR codes already complement labels; dynamic QR codes enhance this system, providing batch-specific safety data without replacing existing disclosures/

Concern: Maintaining dynamic QR code databases is resource-intensive for manufacturers and regulators.

Rebuttal: Many food and beverage products already manage voluntary QR code databases; dynamic systems use scalable cloud solutions, simplifying the shift for enhanced recall safety.

Concern: Consumers may distrust QR codes due to privacy concerns, reducing adoption.

Rebuttal: Voluntary QR codes are widely accepted; dynamic codes with transparent, anonymized data policies build trust, improving safety through better recall access.

Concern: Small retailers may struggle to verify dynamic QR code compliance, increasing burden.

Rebuttal: With voluntary QR codes already in use, dynamic codes are a simple upgrade, and NCWM guidelines can streamline retailer verification for safety compliance.

Concern: Dynamic QR codes could be counterfeited, leading to fraudulent recalls or misinformation.

Rebuttal: Voluntary QR codes already exist securely; dynamic codes with cryptographic signatures ensure authenticity, enhancing consumer safety and recall precision.

Concern: Industry may resist QR code mandates, prioritizing cost over safety.

Rebuttal: Many food and beverage products already use voluntary QR codes, so dynamic codes are a low-cost shift that reduces recall costs and boosts consumer safety, aligning with industry goals.

Concern: QR code mandates may delay product launches due to compliance timelines.

Rebuttal: Voluntary QR codes are common; transitioning to dynamic codes by January 1, 2027, is a simple change that aligns with existing processes, prioritizing safety.

Concern: Not all consumers will scan QR codes, limiting safety benefits. Rebuttal: Voluntary QR codes are already scanned by many; dynamic codes enhance safety for those who use them, complementing traditional labels for broader impact. Batch number can be looked up on mfgr website.

Concern: QR codes may not integrate with existing recall processes, causing inefficiencies.

Rebuttal: Many food and beverage products use voluntary QR codes; dynamic codes align with FDA/USDA protocols, simplifying recalls and improving consumer safety outcomes.

Concern: Mandating dynamic QR codes for batch-specific traceability on food and beverage package labels is a regulatory action that falls under the FDA's jurisdiction, as the FDA oversees food safety and labeling requirements under the Federal Food, Drug, and Cosmetic Act and the Food Safety Modernization Act. The NCWM's role is limited to weights and measures, and imposing QR code requirements exceeds its authority, potentially creating overlapping or conflicting federal and state regulations.

Rebuttal: The NCWM has clear authority under NIST Handbook 130 to establish uniform labeling standards for consumer commodities, including food and beverage products, to ensure accurate and consumer-relevant information, as seen in existing regulations like Section 6. The proposed dynamic QR code requirement complements FDA regulations, such as FSMA's traceability provisions, by providing a state-level mechanism to enhance recall precision and consumer safety without conflicting with federal rules. The NCWM's focus on batch-specific labeling aligns with its mission to standardize packaging information, and coordination with FDA guidelines (e.g., ISO/IEC 18004 standards for QR codes) ensures harmony. States adopting this amendment can implement it as part of their weights and measures programs, which already regulate food labeling, thereby supporting rather than duplicating FDA efforts.

The submitter requested Voting status in 2026.

Comments in Favor:

Regulatory:
-

Industry:
-

Advisory:
-

Comments Against:

Regulatory:
-

Industry:
-

Advisory:
-

Neutral Comments:

Regulatory:
-

Industry:
-

Advisory:
-

Item Development:
New Proposal

Regional Associations' Comments:
WWMA 2025 Annual Meeting:

The committee received comments from Ms. Wendy Hahn (County of Stanislaus, California), Mr. Aaron Yanker (Colorado Department of Agriculture, Weights and Measures), Mr. Jose Arriaga (County of Orange, California), Mr. Mike Brooks (Arizona Department of Agriculture Weights and Measures Services Division), Mr. Kurt Floren (County of Los Angeles, California), Mr. Austin Shepherd (County of San Diego, California), and Mr. Matt Douglas (California Division of Measurement Standards) with a general consensus that this is not a Weights and Measures issue and recommending that the item be withdrawn.

Some of the comments heard also included that this might be an FDA jurisdictional matter; that this might be better addressed by, or included in, the Food Safety Modernization Act; or that this might be a Public Health jurisdictional matter.

Other concerns raised included that this may increase production costs and create gaps in usability for non-smart phone users. Enforcement concerns were also heard including that Weights & Measures officials do not have the authority to implement broad recalls as well as the concern that this is not just a matter of verifying that the quick response (QR) code is present but also that the information provided by use of the QR code is accurate.

The WWMA L&R committee recommends the item be withdrawn.

CWMA 2025 Interim Meeting:

Questions were brought up as to how this really applies to Weights & Measures and one individual wanted the item withdrawn. Nothing currently exists that would prohibit an entity from adding a dynamic QR code of this nature.

The CWMA L&R committee recommends the item be withdrawn.

NEWMA 2025 Interim Meeting:

A regulator from New York commented they are not opposed to QR codes, but feels it is not a weights and measures issue, and indicated they do not enforce food safety regulations. A regulator from New Jersey commented that this is not a weights and measures issue, but may be geared toward FDA or FTC regulations, and recommended a Withdrawn status. A regulator from Vermont agreed with New York and New Jersey.

After hearing comments from the floor, the committee recommended a Withdrawn status, and the body concurred.

SWMA 2025 Annual Meeting:
Mr. Tory Brewer with West Virginia commented that this is not a weights and measures issue. That the item specifically asks for there to be a requirement for recalls. He opposes this item and recommends Withdraw.

Matthew Curran, Florida – recommend forwarding this item and asking that it be Assigned to PALS for further evaluation and vetting. He believes the topic has potential merit and use beyond the weights and measures realm but need to ensure it is weights and measures related before going into the Handbooks. There are currently food products in Florida that are required to have QR codes for required consumer information and there are many companies that have elected to add QR codes on their products, so the concept is currently utilized. He also would caution against exclusions (as proposed) as this may create unintended loopholes, if not written properly.

Ms. Alison Wilkinson with the state of Maryland echoes Florida in that the item be Assigned to PALS

Mr. Jason Glass with the state of Kentucky recommends an editorial change with section 6.3.X (f). To edit "conference" to "council" within the section.

6.3.X Dynamic QR Code –

(f) Exemptions: Food and beverage consumer packages exempt from this requirement include those with a net weight or volume less than 10 grams or 10 milliliters, or as otherwise determined by the National ~~Conference~~ Council on Weights and Measures, where labeling space constraints render compliance impractical.

The Committee has referenced the recommended editorial changes to this item and based on the comments made from the floor, believes this item has merit and recommends Developing status.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents.

MOS – UNIFORM REGULATION FOR THE METHOD OF SALE OF COMMODITIES

MOS-24.2 2.16.3.1. Tare Weights, Part (c) Allowable difference.

Source:
National Propane Gas Association

Purpose:
Resolve the discrepancy that exists between Handbook 130 and Title 49 of the Code of Federal Regulations with respect to the allowable differences between the stamped tare weight and the actual tare weight of cylinders used for compressed or liquefied gases in refillable cylinders.

Item under Consideration:
Amend the Uniform Regulation for the Method of Sale of Commodities as follows:

2.16.3.1. Tare weights.

…

(c) **Allowable difference.** – If the stamped or stenciled tare is used to determine the net contents of the cylinder, the allowable difference between the actual tare weight and the stamped (or stenciled) tare weight, or the tare weight on a tag attached to the cylinder **~~for a new or used cylinder, shall be within~~**:

(1) For cylinders manufactured prior to December 28, 2022, shall be within:

i. $\frac{1}{2}$ % for tare weights of 9 kg (20 lb) or less; or

ii. $\frac{1}{4}$ % for tare weights of more than 9 kg (20 lb).

(2) For cylinders manufactured on or after December 28, 2022, shall be within the following limits prescribed by general requirements for specification cylinders, 49 C.F.R. § 178.35:

i. For a cylinder of 25 lb or less at the time of manufacture, a lower tolerance of (-) 3 % and an upper tolerance of (+) 1 %; or

ii. For a cylinder exceeding 25 lb at the time of manufacture, a lower tolerance of (-) 2 % and an upper tolerance of (+) 1 %.

NOTE: Failure of a cylinder tare weight to be within the required allowable difference is considered a Method of Sale violation. The cylinder shall be removed from use until the tare weight is corrected.

Previous Status:
2025: Voting – Returned to Committee

2024: Informational

Original Justification:

The data presented in NIST Special Publication, "NIST SP 2200-01, 2022 NCWM-NIST National Survey on 20 lb LPG (Propane) Cylinders," is sufficient evidence that the tolerances imposed in Handbook 130 on the marking of tare weights for propane cylinders are not in sync with the real world. For example, the report states that *"nearly half (44.3%) of new cylinders and significantly less (32.0% of used cylinders were in compliance with existing tare weight requirements,"* (in reference to the current Handbook 130 requirements). Which means, of course, that the great majority of cylinders, even new cylinders, were not in compliance. The reasons for that include the following:

- As quoted from the report, *"Initial assessments suggest that cylinder manufactures use a tolerance of 1%, which is primarily based on Measurement Canada's requirement of 1%."* If a cylinder's tare weight can vary +/- 1% from stamped value as manufactured, a cylinder's actual tare weight cannot be expected to be within +/- 0.5% of the marked value after the cylinder at any point in time thereafter.
- For practical reasons, some manufacturers may use a statistical method to arrive at an average tare weight based on previous measurements of a sufficiently large sample pool. Whatever variance there may be in the actual weight of the cylinder versus the marked tare weight, the fact is that over 98% of the new cylinders weighed were in compliance with the DOT tolerances.
- The following statement from the report is very telling: *"It is highly unusual and irregular to see a tolerance where a very significant majority of the packages are in compliance (in this case, 98.4%)."* The report goes on to state that 34.3% of "used" cylinders would not be in compliance with the DOT tolerances. These two statements call attention to the fact that these grill cylinders are in constant circulation, subject to a wide variety of conditions, treatment and possible abuse by potentially many different customers, thereby underlining the need to steer clear of overburdensome and unwarranted regulation.
- Scales utilized in most retail locations where cylinders are filled are beam scales which do not have the capability of weighing cylinders to the sensitivity or number of decimal places necessary to verify the initial tare weight while a cylinder is under vacuum using Handbook 130 requirements. Additionally, there is no requirement in any national code or standard to fill cylinders by weight at the point of sale when the cylinder is transported for non-commercial use. These cylinders are not considered to be transported "in commerce" and are therefore not required to be filled by weight, thereby allowing for the determination of maximum fill level using the fixed maximum liquid level gauge. Scales are not required to be installed at these facilities.
- Even when the product is released to the atmosphere to "empty" the cylinder, there will always be some amount of liquid and vapor remaining in the cylinder, unless the cylinder has been put under vacuum. The liquid, of course, is much denser than air and the vapor in the cylinder is 1.5 times the weight of the air that was in the sample cylinders when they were weighed to establish the "average" tare weights.
- A minus tolerance of -3% will not result in extreme loss to the propane marketer in most cases, because the overfilling prevention device (OPD) will activate and prevent the overfilling of the cylinder in the vast majority of cases. As stated in the report, only 1.1% of all cylinders tested exceeded the legal filling limit. Considering the time of year that this project was undertaken and in some northern states, it is very likely that some of those cylinders may have been filled volumetrically when the temperature was below 40 °F, it would not be unusual that more product was put into the cylinder because the OPD is calibrated to the maximum fill at 40 °F and the liquid density increases as the temperature gets colder.
- The price for a pound of propane as stated in the report seems high, as it would equate to $5.51 per gallon (4.24 lbs. per gallon). The Department of Energy published the average cost of propane in 2022 and it was shown to be $2.23 per gallon.

Opposing arguments may take the following form:

- "The purpose of Handbook 130 is to ensure that the customer gets what he pays for and that the propane marketer doesn't lose out, either." The rebuttal to this argument from the standpoint of the customer is provided in the justification in number 18 above. From the marketer's standpoint, the fact that the vast majority of retail gallons sold in the U.S. are sold by NPGA members and that those very members endorsed this proposal is evidence that marketers are not concerned about the small quantities of gas that may not be billed to the customer.

- "We should make DOT change their tolerances instead of NCWM changing theirs." The fact is that NCWM allowable differences are so unreasonable that 56% of newly manufactured cylinders were not in compliance with them. That should be reason enough to realize that NCWM needs to change. In addition, once gas is put into a cylinder, there will always be a little bit of liquid remaining in the cylinder unless it is vacuum purged or opened to the atmosphere. This means that accurately measuring the tare weight of a cylinder becomes very difficult unless specific procedures are followed to ensure that the cylinder is truly "empty."

The submitter requested that this be a voting item in 2024 and a retroactive requirement, enforceable to all devices.

Comments in Favor:

Regulatory:
- 2025 Annual: None

Industry:
- 2025 Annual: Mr. Chris Wagner NPGA supports the language and requests voting as it rectifies errors.

- 2025 Interim: Mr. Chris Wagner, National Propane Gas Association, suggested moving the item to Voting with modification. He stated that he does not support or oppose DOT tolerances. Mr. Wagner stated that he is seeking uniformity throughout standards. He said that ranking authority should prevail, and other regulatory agencies should follow suit for uniformity

- **Advisory:**
  - 2025 Interim: None

Comments Against:

Regulatory:
- 2025 Annual : Mr. Matt Douglas California opposed the item and suggested that it be withdrawn. He said the language is not in line with DOT and that DOT is concerned with safety and not consumer protection.

- 2025 Annual: Ms. Alison Wilkinson Maryland said she is aligned with CA, has participated in the NCWM survey, and agrees that something needs to be addressed. She echoed Mr. Douglas' comment that DOT is more for safety, we are here for consumers and business and using stamped on tare weight could be a consumer issue

- 2025 Interim: None

Industry:
- None

Advisory:
- None

Neutral Comments:

Regulatory:
- 2025 Interim: Several weights and measures officials agreed with the recommendation from NIST OWM to wait until the petition to DOT is complete and assign Informational status to the item.

Industry:
- None

Advisory:

- 2025 Annual: Mr. John McGuire NIST OWM advised the membership that there is new language to apply tolerances according to the cylinder's manufacture date. He also informed the Committee that the new language aligns with NIST publications and federal regulations. He added that DOT was happy with the new language.

- 2025 Interim: Mr. John McGuire, NIST OWM, suggested that the Committee wait until the petition to DOT is complete and recommended Informational status be assigned to the item.

Item Development:

NCWM 2025 Annual: The Committee was provided with proposed new language for the item from NIST OWM. The new language was developed in consultation with the National Propane Gas Association. The Committee, hearing support for the language from membership, accepted the proposed changes from NIST OWM. The new language appears in this report. The previous version can be found in NCWM 2025 Publication 16.

The Item, however, did not receive enough votes to pass or fail and was returned to the Committee.

NCWM 2025 Interim: During open hearings the Committee heard support for this item to remain Informational. During the L&R committee's work session the committee assigned a Voting status. NIST OWM suggested assigning Voting status to it pending information from DOT which at the time of writing this report has not been received from DOT.

However, during a subsequent Committee work session dated February 14, 2024, Mr. John McGuire, NIST OWM, stated that additional language previously submitted within the 2023 Southern Weights and Measures regional meeting from NIST OWM should be considered.

This NIST OWM additional language can be found on the NCWM website under supporting documents.

NCWM 2024 Annual: The Committee continues to receive little comment on this issue. The Committee also heard from John McGuire NIST OWM who reiterated that they are still working with DOT. This item remains Informational pending the results of the DOT survey.

NCWM 2024 Interim: The Committee heard little comment on this issue. The Committee also heard from NIST OWM who informed the Committee that they are still working with DOT and recommended the item remain informational. For this reason, the Committee assigned Informational status to the item.

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

Mr. Chris Wagner with the National Propane Gas Association (NPGA) stated that during the NCWM Annual Meeting both the National Institute of Standards and Technology (NIST) and NPGA testified in support of this joint proposal as currently written. As part of this testimony, both NIST and NPGA addressed the fact that the Department of Transportation (DOT) maintains a federal code prohibiting any other entity from imposing rules in conflict with 49 CFR. The current wording contained in 2.16.3.1. Tare Weights, Part (c) Allowable difference is in conflict with 49 C.F.R. § 178.35, and thusly prohibited by 49 C.F.R. § 107.202 . It is NPGA's belief that the current proposal as written rectifies this conflict and allows DOT to continue to work through public comments submitted by the industry. Mr. Chris Wagner stated that he supports a voting status.

Mr. Scott Simmons, representing P 20:10 Services LLC, expressed support for the item and agrees with Mr. Wagner's comments.

Mr. Kurt Floren (County of Los Angeles, California) posed a question regarding whether the intention of the item was to cause a difference in enforcement based upon the 2022 date.

Mr. Chris Wagner responded with a statement that this creates a cleaner proposal for Weights and Measures. The NPGA's opinion is that 49 CFR 107.202 could be interpreted to retroactively preempt the Weights and Measures tolerances, but the industry prefers a non-retroactive interpretation.

Mr. Matt Douglas (California Division of Measurement Standards) expressed opposition because the consumer protection parameters fall within the safety requirements. Mr. Douglas was not aware of the CFR code regarding preemption referenced and would like more time to review.

The WWMA L&R committee recommends a voting status for this item.

CWMA 2025 Interim Meeting:

No comments.

The CWM L&R committee recommends an information status for this item.

NEWMA 2025 Interim Meeting:

A regulator from New Jersey commented that they are not in favor of this item as the tolerances are too large. However, due to not receiving any feedback from USDOT, the item is fully developed to be aligned with the federal code and recommends a Voting status.

After hearing comments from the floor, the committee recommended a Voting status, and the body concurred.

SWMA 2025 Annual Meeting:

Mr. Chris Wagner with NPGA provided the following comments:

DOT prohibits any other entity from imposing rules in conflict with 49 CFR with regard to the design, manufacturing, fabrication, marking, maintenance, reconditioning, repairing, or testing of a packaging or a container which is represented, marked, certified, or sold as qualified for use in the transportation of hazardous materials. The current wording contained in 2.16.3.1. Tare Weights, Part (c) Allowable difference is in conflict with 49 C.F.R. § 178.35, and thusly prohibited by law. It is NPGAs belief that the current proposal as written rectifies this conflict and allows DOT to continue to work through public comments submitted by the industry. The specific language contained in DOTs preemption rule is listed below.

49 CFR § 107.202 Standards for determining preemption.
(a) Except as provided in § 107.221 and unless otherwise authorized by Federal law, any requirement of a State or political subdivision thereof or an Indian tribe that concerns one of the following subjects and that is not substantively the same as any provision of the Federal hazardous materials transportation law, a regulation issued under the Federal hazardous material transportation law, or a hazardous material transportation security regulation or directive issued by the Secretary of Homeland Security that concerns that subject, is preempted:
(1) The designation, description, and classification of hazardous material.
(2) The packing, repacking, handling, labeling, marking, and placarding of hazardous material.
(3) The preparation, execution, and use of shipping documents pertaining to hazardous material and requirements related to the number, content, and placement of those documents.
(4) The written notification, recording, and reporting of the unintentional release in transportation of hazardous material and other written hazardous materials transportation incident reporting involving State or local emergency responders in the initial response to the incident.
(5) The design, manufacturing, fabrication, marking, maintenance, reconditioning, repairing, or testing of a packaging or a container which is represented, marked, certified, or sold as qualified for use in the transportation of hazardous material.

He supports this item and recommends moving forward with Voting status.

The Committee has considered the comments and finds this item to be fully developed and recommends a Voting status.

Additional letters, presentations and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents.

MOS-26.2 2.21.2. Metered Sales by Liquid Volume.

Source:
National Propane Gas Association

Purpose:
Modify 2.21.2 (b) and (c) of IV. Uniform Regulations B. Uniform Regulation for the Method of Sale of Commodities, to require automatic temperature compensation to be performed electronically to ensure the most immediate reaction time of compensation equipment due to questionable reaction time data for mechanical temperature compensation devices in low flow applications.

Item under Consideration:
Amend NIST Handbook 130 Uniform Regulation for the Method of Sale of Commodities as follows:

2.21.2. Metered Sales by Liquid Volume. – All metered sales by liquid volume shall be accomplished using metering systems as follows:

(a) Sales using metering systems with a maximum rated capacity greater than 20 gal/min shall be accomplished using a metering system that automatically compensates for the effects of temperature.

(b) Sales using metering systems with a maximum rated capacity equal to or less than 20 gal/min that were placed into service after January 1, 2026~~7~~, shall be accomplished by use of a metering system that automatically **and electronically** compensates for the effects of temperature.

(c) Effective January 1, 2034, all metered sales **~~(through all capacities of metering devices, regardless of installation and service date)~~through devices with a maximum rated capacity equal to or less than 20 gal/min that were placed into service prior to January 1, 2027,** shall be accomplished by use of a metering system that automatically **and electronically** compensates for **the effects of** temperature.

Previous Status:
New Proposal

Original Justification:
Existing data has been presented by way of a Linco-Electromatic, Inc.Technical Paper that calls into question the efficacy of mechanical temperature compensation equipment when connected to low flow pumping or dispensing systems. This paper calls out a reaction time ranging from three to six minutes before adequate compensation begins. With this lag time no single container filled by a LP Gas dispenser would receive compensated product if utilizing a mechanical temperature compensator. To ensure equity for propane sellers and buyers proper and immediately reactive temperature compensation equipment is needed.

The submitter acknowledged that State Weights and Measures officials have stated that during the conduction of meter proving with mechanical temperature compensation they have not witnessed the slow reaction times stated in the Linco-Electromatic, Inc. Technical Paper, although there is a flush performed prior to the actual meter flow test and not from direct start up.

The submitter requested Voting status in 2026.

Comments in Favor:

Regulatory:
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Industry:
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Advisory:
•

Comments Against:

Regulatory:
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Industry:
•

Advisory:
•

Neutral Comments:

Regulatory:
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Industry:
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Advisory:
•

Item Development:
New Proposal.

Regional Associations' Comments:

<u>WWMA 2025 Annual Meeting:</u>

Mr. Chris Wagner with the National Propane Gas Association (NPGA) referenced a study called the "Linco-Electromatic, Inc. Technical Paper" which demonstrates that electronic temperature compensation is immediate and meaningful in comparison with mechanical temperature compensation, which has a lag time that renders it ineffective for small drafts. He also stated the electronic compensators are more expensive so retailers, if left to their own devices, will install mechanical compensators to comply with the 2034 requirement. The NPGA polled the industry and no contradictory data could be found. Mr. Chris Wagner recommended a voting status.

Mr. Scott Simmons (P 20:10 Services LLC) was opposed to the item and recommended the item be withdrawn. He expressed that mechanical automatic temperature compensators (ATCs) have been in use on dispensers with flow rates less than 20 gallons per minute for more than the 32 years that he has been testing and inspecting these devices. He also stated that both mechanical and electronic compensators are accurate and doesn't believe that existing technology should be limited without supporting statistical data. Mr. Simmons pointed out that the technical paper was based on large volumes of crude oil and does not apply to small deliveries of LPG. Additionally, he voiced concern that many propane companies have already invested in mechanical temperature compensators to comply with recently adopted requirements and would have to replace this equipment should this proposal be adopted.

Mr. Mahesh Albuquerque (Colorado Division of Oil and Public Safety) stated that his position was neutral on this item but shared the concern of the cost of replacement being substantial. He stated that Colorado has adopted regulations requiring ATCs by 2030 but does not specify whether these need to be mechanical or electronic.

Mr. Albuquerque stated it wasn't fair to require a business to who just invested in a mechanical ATC to have to replace the ATC with an electronic ATC.

Mr. John Beall (County of Ventura, California) stated that while working in the field he checked propane deliveries with mechanical compensators and did not notice a trend of mechanical compensators being associated with inaccuracies. He sees the need to move towards ATC but not necessarily specifying which one must be required.

Mr. Mike Brooks (Arizona Department of Agriculture, Office of Weights and Measures) recommended forming a task group to address the contradiction in previous testimonies regarding the applicability of the study and the merits of mechanical vs electronic compensators.

Mr. Brent Ricks (Montana Weights and Measures Program) stated that Montana has a statute requiring compensation but does not specify whether these need to be electronic or mechanical. They have noticed more failures for mechanical than electronic for high flow rates but there are no electronic compensators at low flow rates to compare. Mr. Brent Ricks concurred with Mr. Mike Brooks about creating a task group.

Mr. Chris Wagner (NPGA) is not in opposition to further studies and recognizes the study was on a different product but claimed that it is the only study in existence today. He clarified that an item can always be downgraded but not upgraded; and that he is concerned with the potential that 7000 mechanical ATCs may be installed annually only to be forced to be replaced with electronic ATCs after the studies confirm what they already know - that electronic ATCs are more accurate. He recommends a voting status for this item realizing the item can always be downgraded in the future.

Mr. Loren Minnich asked a question as a consumer. If consumers buy about 4lbs for a typical cylinder, what is the draft size used during a test?

Mr. Matt Douglas (California Division of Measurement Standards) responded to Mr. Minnich indicating that the test draft is approximately 20 gallons. He also stated that he was not aware the study was not for the same product and that these devices have been National Type Evaluation Program (NTEP) approved already. He said that he recognizes the NPGA viewpoint about replacement however this item as it exists is not ready for a vote.

Mr. Scott Simmons (P 20:10 Services LLC) stated that a test draft size is 20 or 25 gallons and that an empty consumer LPG bottle would receive approximately 4.5 gallons. On that small of a draft there would be limited benefit for an ATC. He reiterated that the mechanical ATCs have been in use for many years and have been type approved, and ATCs are already required by our Handbooks. He also stated that there is only one company who developed an electronic ATC. There are currently no electronic ATCs installed on meters operating under 20GPM, so if this requirement goes into effect all of the meters that already have temperature compensation will need to be upgraded. We should not outlaw approved technology without significant data. Without the data we cannot make a decision.

Mr. Aaron Yanker (Colorado Department of Agriculture, Weights and Measures) stated that he was cautious about assigning this to a task group and suggested that industry should supply supporting data. Mr. Yanker then stated that if not withdrawn the item should be assigned a developing status.

The WWMA L&R Committee recommends a developing status for this item and suggests that the NPGA reach out to stakeholders to collect data to support the necessity of electronic temperature compensators over mechanical. The WWMA L&R Committee further recommends to the NCWM L&R Committee that, once such data is available, the merit of this item and both the effective and non-retroactivity dates identified in subsections (b) and (c) should be reassessed.

<u>CWMA 2025 Interim Meeting:</u>

A letter of opposition was received from Colorado and is posted on the CWMA website. Ivan Hankins, IA, concurs with the letter of opposition and recommended withdrawal of this item.

The CWMA L&R Committee recommends a Withdrawn Status for this item.

NEWMA 2025 Interim Meeting:

A regulator from New York commented that the way the proposal is currently written in section 2.21.2(c) leaves out devices that may be installed on January 1, 2027, and pointed out that the Handbook currently reads "Effective January 1, 2030", and needs to be struck to include the new date of 2034. New York recommended a Voting with the editorial changes. The committee referenced a supporting document that appear on the NEWMA website from a representative of P 20:10 Services, LLC. The supporting document requested a Withdrawn status for several reasons, but namely that a study the submitter relied on for data was confined to measuring crude oil, and not LPG.

After hearing comments from the floor, and considering the supporting document, the committee recommended a Voting status, and the body concurred.

During a subsequent committee review of this item, it was discovered that the comments made by New York regarding the 2030/2034 date were based on the language that appears in the 2025 Handbook. The committee now points out that during the 2025 Annual NCWM Meeting, a vote was held on MOS-25.1, which changed the date to 2034, and it will appear as such in the 2026 Handbook. After further review, the committee recommends the following editorial changes to section 2.21.2(c) based on the remaining comments from New York, to include "on or before" prior to January 1, 2027:

(c) Effective January 1, 2034, all metered sales **~~(through all capacities of metering devices, regardless of installation and service date)~~ through devices with a maximum rated capacity equal to or less than 20 gal/min that were placed into service on or before ~~prior to~~ January 1, 2027,** shall be accomplished by use of a metering system that automatically **and electronically** compensates for **the effects of** temperature.

SWMA 2025 Annual Meeting:

Mr. Chris Wagner, with the NPGA commented that members are preparing for a $198 million infrastructure investment to comply with the retroactive requirements for temperature compensation. Industry and manufacturers admittedly have no data to substantiate or refute existing study that has been submitted into the record related to temperature compensation. NPGA has developed an initial study proposal in partnership with meter manufacturers, NIST, dispenser manufacturers, propane marketers, and the Propane Education and Research Council but seeks State Weights and Measures input prior to finalization of test methodology and protocol and in witnessing of proposed testing. NPGA has secured all funding necessary to complete the study. NPGA seeks Assigned or Developing status.

Ms. Alison Wilkinson with the state of Maryland agrees with NPGA that this item should be given a Developing status.

Based on the comments made from the floor the Committee recommends a Developing status.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents.

MOS-26.3 Section 2.20 Gasoline and Gasoline Oxygenate Blends

Source:
American Petroleum Institute

Purpose:
Add requirements to the method of sale for liquid measuring devices that perform temperature compensation and/or density correction.

Item under Consideration:
Amend NIST Handbook 130 Uniform Regulation for the Method of Sale of Commodities as follows:

2.20. Gasoline and Gasoline Oxygenate Blends

2.20.1. Method of Retail Sale. – Type of Oxygenate must be Disclosed. – All automotive gasoline or automotive gasoline-oxygenate blends kept, offered, or exposed for sale, or sold at retail containing at least 1.5 mass percent oxygen shall be identified as "with" or "containing" (or similar wording) the predominant oxygenate in the engine fuel. For example, the label may read "contains ethanol" or "with MTBE." The oxygenate contributing the largest mass percent oxygen to the blend shall be considered the predominant oxygenate. Where mixtures of only ethers are present, the retailer may post the predominant oxygenate followed by the phrase "or other ethers" or alternatively post the phrase "contains MTBE or other ethers." In addition, gasoline-methanol blend fuels containing more than 0.3 % by volume methanol shall be identified as "with" or "containing" methanol. This information shall be posted on the upper 50 % of the dispenser front panel in a position clear and conspicuous from the driver's position in a type at least 12.7 mm (1/2 in) in height, 1.5 mm (1/16 in) stroke (width of type).

(Amended 1996)

2.20.2 Product Transfer Document Requirements. – The retailer shall be provided information that complies with PTD requirements for gasoline, gasoline additives, and gasoline regulated blendstocks **40 C.F.R. § 1090.1110,** at the time of delivery of the fuel, on product transfer documents such as an invoice, bill of lading, shipping paper, or other documentation. Additional declarations may be required for specific fuels **and/or measuring devices:**

(a) For fuels containing multiple oxygenates or oxygenates other than ethanol a declaration of the predominant oxygenate or combination of oxygenates present in concentrations sufficient to yield an oxygenate content of at least 1.0 % by volume in the fuel. Where mixtures of only ethers are present, the fuel supplier may identify either the predominant oxygenate in the fuel (i.e., the oxygenate contributing the largest mass percent oxygen) or alternatively, use the phrase "contains MTBE or other ethers."

(b) For fuels containing more than 0.3 % by volume methanol a declaration shall be identified as "with" or "containing" methanol.

(c) A written invoice based on a reading of a device that is equipped with an automatic or nonautomatic temperature compensator shall show the net volume delivered and that the volume delivered has been adjusted to the volume at 15 °C (60 °F).

(d) A written invoice based on a reading of a device that is equipped with an automatic or nonautomatic density-correction system shall show the excess volume for the finished product and the net standard volume inclusive of the excess volume for the finished product adjusted to the volume at 15 °C (60 °F).

(Added 1984) (Amended 1985, 1986, 1991, 1996, 2014, 2022, ~~and~~ 2023**, and 202X**)

Previous Status:

2026: New Proposal

Original Justification:

Section IV., B. Method of Sale of Commodities, gasoline and gasoline oxygenate blends does not have a requirement for an invoice to include a statement that a calculated volume has been adjusted to a temperature of 15 °C (60 °F). The proposed language adds such a requirement.

Handbook 44 allows the use of automatic and nonautomatic temperature compensators to be used to calculate the net volume of the product at a reference temperature, but there is not a requirement in the Method of Sale to reflect that information on the invoice, though it is industry practice to do so. Additionally, due to the fact that the volume of gasoline and ethanol when blended is more than the volume of the two liquids measured separately, a proposal to modify Handbook 44 has been submitted to the NCWM to clarify that it is acceptable to use specific density-correction methods that allow for the accurate determination of volume growth that occurs when gasoline is blended with ethanol to make finished gasoline.

Automatic temperature compensators have been used for decades throughout the United States to calculate the net volume of the fuel being sold at terminals. Including a statement on the invoice to that effect identifies that the calculation has been done.

In 2019, the American Petroleum Institute published a Manual of Petroleum Measurement Standards (MPMS) Chapter 11.3.4, *Miscellaneous Hydrocarbon Properties - Denatured Ethanol and Gasoline Component Blend Densities and Volume Correction Factors,* that identifies multiple blending scenarios to calculate the excess volume that occurs when gasoline and ethanol are blended. Ch. 11.3.4 is a subchapter of the parent document Ch. 11, *Physical Properties Data*.

Ch. 11 is used throughout the petroleum industry to ensure the physical properties of the fuels are properly assessed to ensure that the fuel measured throughout the manufacturing and distribution system is done accurately and transparently using industry recognized standards. Indeed, measurements are taken at the refinery when fuel is moved into a pipeline, when the fuel is moved out of the pipeline into a terminal, and when the fuel is loaded from the terminal into a truck for delivery to a retail gasoline station. A recently released video by NIST states that every drop of fuel "passes through a meticulous system of measurements" from where the crude oil is extracted to the terminal to "prevent costly losses." [Source: Trust in Transactions: The Economic Power of Data – Moser April 9, 2025, https://www.nist.gov/pml/owm/weights-and-measures-economic-index.] The meticulous system of measurements often use API approved standards that are developed by the API Committee on Petroleum Measurement (COPM). Consequently, it is not a stretch to say that it is "firmly established trade custom and practice" to use the API MPMS standards to measure fuels throughout the industry worldwide. [see reference to HB 130, III. Uniform Laws, A. Weights and Measures Law, Section 16, Method of Sale (p. 29)]

The requirements for invoices in Handbook 130 – Section IV., Sec. B. Uniform Regulation for the Method of Sale of Commodities, Paragraph 2.20. Gasoline and Gasoline Oxygenate Blends – are minimal in scope providing only a reference to the U.S. Environmental Protection Agency (EPA) rules. These rules, summarized below require only the volume of the product being transferred to be identified.

> **EPA Rules at 40 C.F.R. § 1090.1110, PTD requirements for gasoline, gasoline additives, and gasoline regulated blendstocks**, paragraph "(a) ***General requirements.*** On each occasion when any person transfers custody or title of any gasoline, gasoline additive, or gasoline regulated blendstock, other than when fuel is sold or dispensed to the ultimate end user at a retail outlet or WPC facility, the transferor must provide the transferee PTDs that include the following information: (1) All applicable information required under § 1090.1100 and this section." [emphasis added]
>
> **Section "1090.1100 General Requirements"** states (a)(1)(iii) a PTD must include a set of information including (iii) **"The volume of the product being transferred."** [emphasis added]

This proposed change to HB 130 Method of Sale makes it clear that if the volume of a product is calculated and changed to reflect a change in volume, that the invoice reflects that change and cites the reference temperature.

Today multiple API standards (identified below) ensure accurate and transparent measurement. Further, sales agreements may state that where temperature compensation is used, those calculations incorporate the methods and procedures specified in API MPMS Chapter 11.[1]

- Ch. 8.1 Manual Sampling of Petroleum Products (ASTM D4057)
- Ch. 5.x Metering (5.1 General Considerations for Measurement by Meters, with specific chapters that address for displacement meters, turbine meters, Coriolis meters, ultrasonic flow meters, Fidelity and Security of Flow Measurement Pulsed-Data Transmissions Systems)

[1] https://www.api.org/-/media/files/publications/2024-catalog/2024-publication-catalog.pdf.

- Ch. 6.x – Metering Systems (6.1 Metering Assemblies- General Considerations, with specific chapters for - Truck and Rail Loading and Unloading Measurement Systems; - Pipeline and Marine Loading/Unloading Measurement Systems; and Lease Automatic Custody Transfer Systems)
- Ch. 4.x Proving Systems (Displacement Provers, Master-Meter Provers, Field Standard Test Measures, Methods of Calibration for Displacement and Volumetric Tank Provers, Part 1—Introduction to the Determination of the Volume of Displacement and Tank Provers)
- Ch. 7.4 Dynamic Temperature Measurement
- Ch. 11 Physical Properties Data (ASTM D1250, Adjunct)
    - Chapter 11.1 - Temperature and Pressure Volume Correction Factors for Generalized Crude Oils, Refined Products, and Lubricating Oils
    - Ch. 11.3.3 Miscellaneous Hydrocarbon Product Properties—Denatured Ethanol Density and Volume Correction Factors
    - Ch. 11.3.4 Miscellaneous Hydrocarbon Properties - Denatured Ethanol and Gasoline Component Blend Densities and Volume Correction Factors
    - Ch. 11.4.1 Density of Water and Water Volumetric Correction Factors for Water Calibration of Volumetric Provers
- Ch. 12.2 Calculation of Petroleum Quantities using Dynamic Measurement Methods and Volumetric Correction Factors
- Ch. 21.2 Electronic Liquid Measurement Using Positive Displacement and Turbine Meters

Why should we use and accept API standards? Handbook 130, Uniform Weights and Measures Law, Section 16, recognizes “firmly established trade custom and practice” that dictate how liquid fuels are sold. Specifically, it states,

Section 16. Method of Sale

Except as otherwise provided by the Director or by firmly established trade custom and practice,

(a) commodities in liquid form shall be sold by liquid measure or by weight; and

(b) commodities not in liquid form shall be sold by weight, by measure, or by count.

The method of sale shall provide accurate and adequate quantity information that permits the buyer to make price and quantity comparisons.

(Amended 1989)

In 2024, the U.S. customers consumed 137 billion gallons of gasoline (most of which was 10% ethanol) and 63 billion gallons of diesel fuel. Another 24 billion gallons of jet fuel were consumed in the U.S. At each stage of the process from producing the crude oil to selling the finished fuel to a retail gasoline station the product is measured. So, while there is over 224 billion gallons of finished product consumed in the U.S., those molecules have likely been measured many times over. These measurements are so important that the API Committee on Petroleum Measurement (COPM) meets twice a year, with over 700 people in attendance, at each meeting to review the standards that are used in the U.S. and around the world. By definition, the petroleum industry uses the API standards which are firmly established trade custom and practice.

Some have raised concerns that metering systems should not modify the volume of the product after it has gone through the custody meter. This concern appears to be premised on the belief that the gross volume **and** the net standard

temperature compensated volume are measured. In practice, the only measured volume is the gross volume and that is measured by counting pulses from the meter in accordance with an API standard. The gross volume is then used by the custody transfer system or the automatic terminal management system to calculate the net volume using another set of API standards including Chapters 5.x, 6x, 7.4, 11.1, 11.3.3, 11.3.4, 12.2, and 21.2. Please see above for the names of these standards.

Some have indicated that HB 130, IV. Uniform Regulations, A. Uniform Packaging and Labeling Regulation, Paragraphs 7.4.(b) and 7.5.(b) may already include a requirement.

7.4. SI Units: Mass, Measure.

(b) in units of liquid measure shall be in terms of the liter or milliliter, and shall express the volume at 20 °C, except in the case of petroleum products or distilled spirits, for which the declaration shall express the volume at 15.6 °C, and except also in the case of a commodity that is normally sold and consumed while frozen, for which the declaration shall express the volume at the frozen temperature, and except also in the case of malt beverages or a commodity that is normally sold in the refrigerated state, for which the declaration shall express the volume at 4 °C;

(Amended 1985)

7.5 U.S. Customary Units: Weight, Measure.

(b) 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, except in the case of petroleum products or distilled spirits, for which the declaration shall express the volume at 60 °F, and except also in the case of a commodity that is normally sold and consumed while frozen, for which the declaration shall express the volume at the frozen temperature, and except also in the case of a commodity that is normally sold in the refrigerated state, for which the declaration shall express the volume at 40 °F, and except also in the case of malt beverages, for which the declaration shall express the volume at 39.1 °F;

(Amended 1985)

The submitter requested that this be a Voting Item in 2026.

Comments in Favor:

Regulatory:
-

Industry:
-

Advisory:
-

Comments Against:

Regulatory:
-

Industry:
-

Advisory:

Neutral Comments:

Regulatory:
-

Industry:
-

Advisory:
-

Item Development:
New Proposal

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

Mr. Matt Sheehan (Chevron) gave a presentation, which is available on the WWMA website, and recommended a voting status.

Russ Lewis (Marathon Petroleum) supported a voting status.

Mr. Kevin Schnepp (California Division of Measurement Standards) made the comment that there have been efforts to harmonize the Uniform Fuels and Automotive Lubricants Regulation with the Uniform Regulation for the Method of Sale of Commodities and that FLR 3.2.5 would need to be harmonized with this MOS language.

The submitter acknowledged that this item is a companion to LMD-26.1, on the Specifications and Tolerances Committee agenda, and provided a roster of the industry-led Density Correction Work Group that contributed to the development of this item. This roster of participants is posted on the WWMA website.

The WWMA L&R Committee recommends a voting status.

CWMA 2025 Interim Meeting:

Individuals were concerned on the number of regulators not being involved in API's work. Several regulators and individuals recommended withdrawal or an assigned status and one individual was in support of voting status.

The CWMA L&R Committee recommends an informational status for this item.

NEWMA 2025 Interim Meeting:

A presentation was given by a representative of American Petroleum Institute (API), which explained the growth in a final product when ethanol and gasoline are blended together. He commented that for those terminals that do not have a side-stream meter, rather relying on ratio blending meters, a density correction system would allow an accurate calculation of the growth of the product, and this item would require the results of that calculation to be on product transfer documents. The representative from API recommended a voting status. A representative from Marathon Petroleum commented that their older terminals were designed to deliver "neat" hydrocarbons and when ethanol blending was required, they had to retrofit the terminals. She pointed out that a flow meter needs a specific length of unobstructed pipe to get the symmetrical velocity profile for an accurate measurement. If a side stream configuration is not possible or practical, then a density correction system would need to be used. She indicated that these systems allow accurate delivery to the customers. Marathon Petroleum supports the proposal and requests a voting status. A representative from Growth Energy commented that the company implements ethanol into the fuel stream in the US in various ways and is curious how this would apply to retailers. There was discussion between API and Growth Energy on this topic, and the committee indicated that this proposal was specific to wholesale meters and if there were further

questions about possible retail implementation, the two representatives should contact each other. A regulator from New Jersey commented that this item is interdependent on the passage of LMD-26.1, and if the practice of density correction systems is allowed, then the corrections should absolutely be recorded on the invoice. New Jersey recommended a Withdrawn status, but also recommended that if both LMD-26.1 and MOS-26.1 move forward, then NCWM should find a way to have both items heard in tandem through the process. A representative from TSL Consulting commented that there is language in the Uniform Engine Fuels and Automotive Lubricants Regulation that is almost identical to the original language in the Uniform Method of Sale, and asked this committee to make a recommendation to harmonize the languages, especially for States that adopt both. He also commented that this item is not interdependent on LMD-26.1, rather it is complimentary, as the handbook does not currently prohibit density correction. The regulator from New Jersey agreed with this comment. The representative from TSL Consulting recommended Voting status.

After hearing comments from the floor and reviewing the presentations provided by API, the committee recommended a Developing status, and the body concurred. The committee also recommends that the submitter work with the NCWM L&R Committee to identify the language in the Uniform Fuels and Automotive Lubricants Regulation Section 3.2.5 Product Transfer Document (PTD) Requirements that need to be modified so they align with this proposal.

SWMA 2025 Annual Meeting:

Mr. Prentiss Searles with API presented the item.

Mr. Randy Jennings as the Vice Chair with FALS commented that the conforming amendment to the proposal to include F.3.2.5. not be added to this proposal. That Handbook 130 engine fuel regulation focuses on quality.

Mr. Matt Shein with Chevron supports this item and recommends Voting status.

Mr. Russ Lewis with Marathon Petroleum echoes Chevrons' statement and recommends a Voting status.

Mr. Jared Scott with Exxon Mobile echoes Chevrons' statements and recommends a Voting status.

Ms. Alison Wilkinson, with the state of Maryland, believes this is not ready to be moved forward and is not fully developed and suggests additional oversite review from regulators.

The Committee has accepted the request that was made from the floor to not make a recommendation to NCWM to include the conforming amendment F.3.2.5. to this item. Based on other comments made from the floor, the Committee finds this item has merit, is fully developed, and recommends a Voting status.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents.

UPR – UNIFORM UNIT PRICING REGULATION

UPR-26.1 Uniform Unit Pricing Regulation: Multiple Sections

Source:
NIST office of Weights and Measures

Purpose:
The purpose of this proposal reflects necessary changes to align unit pricing practices with modern consumer needs, evolving retail environments, and technological advancements. These revisions aim to enhance the clarity, consistency, and accessibility of unit pricing across various retail formats, including digital marketplaces and brick-and-mortar retail establishments. By standardizing best practices, the updates improve consumers' ability to compare prices accurately, regardless of product type, packaging, or sales channel.

States should adopt the revised regulation to promote uniformity, protect consumer rights, and support informed purchasing decisions. Uniform adoption reduces confusion and compliance burdens on interstate retailers while strengthening enforcement of fair pricing practices. It ensures that all consumers, regardless of their location or abilities, benefit from accurate, legible, and meaningful unit price information. Adopting this regulation also signals a commitment to economic equity and consumer protection, helping states foster competitive markets that prioritize trust, fairness, and efficiency in both brick-and-mortar and digital retail environments.

Item under Consideration:
Amend the NIST Handbook 130 Uniform Unit Pricing Regulation as follows:

Uniform Unit Pricing Regulation

as adopted by

The National ~~Conference~~**Council** on Weights and Measures

1. Background

The Uniform Unit Pricing Regulation (**U**UPR) (renamed in 1983) provides a national approach to the subject for those jurisdictions choosing to adopt such a regulation. The traditional approach of the ~~Conference~~**Council** in drafting Uniform Regulations has been to design specific implementing Regulations for the enforcement of the broader requirements of the Uniform Weights and Measures Law. Given the authority of Sections 12**11**.(c) and (d), and the mandate of Section ~~16~~**15**. of this Law, as well as the trend in unit pricing, both voluntary and mandatory, the **U**UPR is considered appropriate. Unit pricing has been a concern of the weights and measures official and has been required for random weight packages for a long time.

In 1993, the NCWM was contacted by several weights and measures jurisdictions and retail trade associations who requested that the **U**UPR be updated to add new commodity groups and pricing requirements. The comments indicated that many commodity groups for non-food products were not included in the table and that some of the required units may not be appropriate for many of the new products being sold in stores. Another concern was that the UPR specified pricing only on the basis of price per pound on most products sold by weight. This has resulted in some jurisdictions not enforcing the requirements on stores that voluntarily **use** unit price on the basis of price per ounce instead of price per pound. The NCWM agreed that the **U**UPR should be revised to encourage wider adoption and use of the uniform regulation and that provisions for unit pricing in metric units should be included.

At the 1997 Annual Meeting, the NCWM adopted revisions to the regulation to permit retail stores that voluntarily provide unit pricing to present prices using various units of measure.

The NCWM eliminated the table of product groupings because it is difficult to keep it current and inclusive, so some newer products were not included under the uniform requirements. The table was replaced with requirements that specify that the unit price is to be based on price per ounce or pound, or price per 100 grams or kilogram, if the packaged commodity is labeled by weight. For example, the proposed revisions would require the unit price for soft drinks sold in various package sizes (e.g., 12 fl oz cans through 2 L bottles) to be uniformly and consistently displayed in terms of either price per fluid ounce, price per quart, or price per liter. The NCWM also increased the price of commodities exempted from unit pricing from 10 cents to 50 cents. The NCWM believed these revisions would ensure that unit pricing information facilitates value comparison between different package sizes and/or brands offered for sale in a store.

The NCWM also considered several comments on this item from members of the U.S. Metric Association (USMA). Most of these comments suggested that the **U**UPR be amended to require unit pricing in metric units and permit U.S. customary unit pricing to be provided voluntarily. When it developed the proposed revisions, the NCWM included guidelines for both U.S. customary and metric unit pricing and believes this is the correct approach to implementing metric revisions in the regulation. The NCWM would like to make it clear that the **U**UPR applies only when stores voluntarily provide unit pricing information. Its purpose is to provide a standard that retailers must follow to ensure

that consumers will have pricing information that helps them make value comparisons. The decision to provide unit price information in metric or U.S. customary units rests with retailers who will respond to consumer preference. The NCWM believes that consumer preference will be the deciding factor as to when and how quickly metric unit pricing is used in the marketplace. Therefore, the NCWM does not support amendments to include mandatory provisions in the **U**UPR**,** as these provisions would take the decision to go to metric unit pricing out of the hands of consumers and retailers. Finally, the NCWM does not want to include any requirement that may discourage retailers from voluntarily providing unit price information.

(Amended 1997 **& 202X**)

~~In December 2014, NIST published a unit pricing best practice guide,~~ NIST **OWM published the original Special Publication** SP 1181, "Unit Pricing Guide, A Best Practice Approach to Unit Pricing," **in 2015,** which can be found at **https://doi.org/10.6028/NIST.SP.1181**. The guide was developed to provide retailers with information about the best practice requirements for the unit pricing of pre-packaged commodities, which will improve the accuracy, usability, and uniformity of unit pricing information offered in retail stores. **In 2024, the Unit Price workgroup was reconvened to review and update the guide, including making recommendations for unit pricing best practices in the online environment and addressing electronic shelf labels in conventional retail stores.** The guide is not intended to conflict with the **U**UPR. Mandatory regulations should be consulted to ensure those requirements are met before the recommended best practice requirements in this guide are implemented.

The National ~~Conference~~Council** on Weights and Measures (NCWM) is supported by the National Institute of Standards and Technology (NIST) in partial implementation of its statutory responsibility for "cooperation with the states in securing uniformity in weights and measures laws and methods of inspection."*

2. Status of Promulgation

~~The table beginning on page 6~~ Figure 1, illustrates the status of adoption of the Uniform Unit Pricing Regulation.

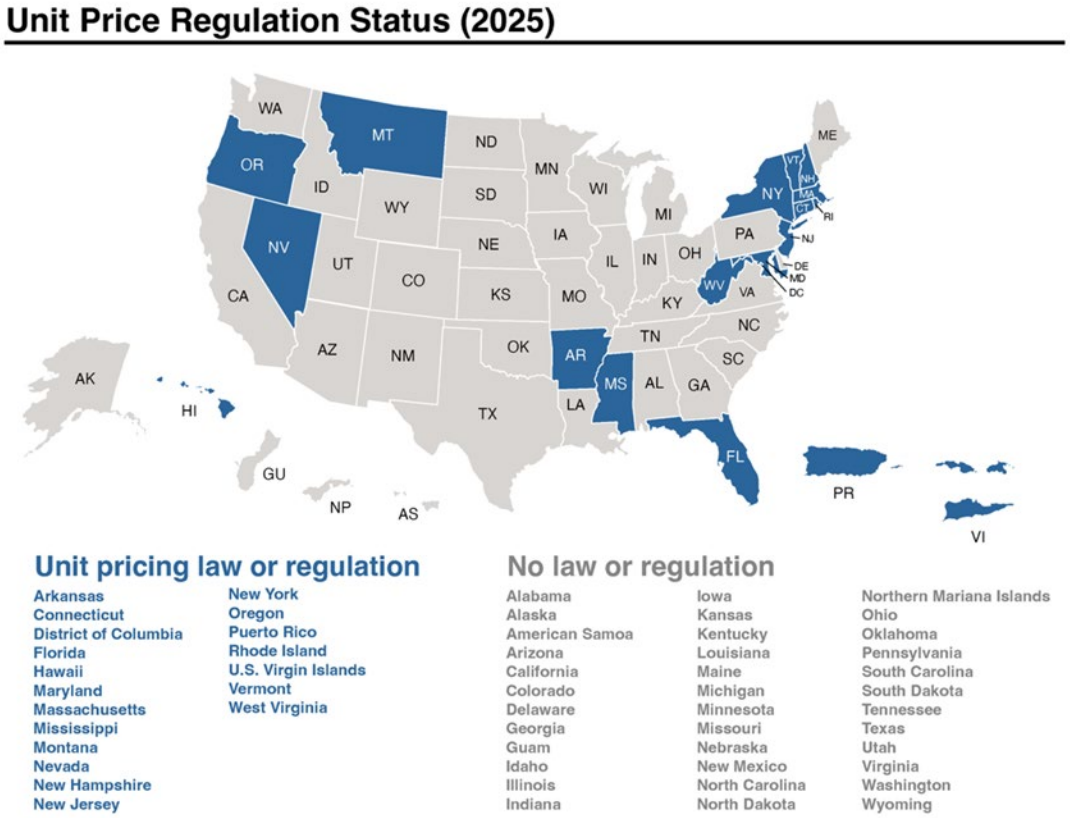

Table of Contents

C. Uniform Unit Pricing Regulation

Section 1. Application

The purpose of this regulation is to establish uniform requirements for the presentation and display of unit pricing information for consumer commodities offered for retail sale. Unit pricing enables consumers to make value-based price comparisons by providing cost-per-unit-of-measure information. This regulation supports fair marketing practices, promotes pricing transparency, and enhances consumer choice across all retail channels, including in-store and e-commerce environments.

Except for random and uniform weight packages that clearly state the unit price in accordance with existing regulations, any retail establishment providing unit price information for packaged commodities shall provide the unit price information in the manner prescribed herein.

(Amended 202X)

Section 2. Definitions

***2.1 Unit Price* – A Unit price is the cost per unit of measure of products, such as the cost per milliliter or per ounce.**

***2.2 Retail Price* – Retail price is the total selling price of a consumer commodity**.

***2.3 Electronic Shelf Label (ESL)*- An ESL is an electronic display that retailers can use to present a product's name, price, unit price, and other information on a small wired or wireless panel, usually on the edge of a store shelf.**

***2.4 E-Commerce* - E-commerce is the process of using digital platforms to offer for sale, transact sales, and deliver consumer product(s) or non-consumer product(s) when the purchaser is not physically present at the point of purchase.**

(Amended 202X)

Section ~~2~~3. Terms for Unit Pricing

~~The declaration of the unit price of a particular commodity in all package sizes offered for sale in a retail establishment shall be uniformly and consistently expressed in terms of:~~

The declaration of the unit price of a particular product category in all package sizes offered for sale in a retail establishment or e-commerce site shall be uniformly and consistently expressed in the terms below. The same unit of measure should be used whether sold in a standard pre-pack, random weight pre-pack, loose from bulk, and regardless of multiple locations within the store or e-commerce sites

(a) Price per kilogram or 100 g, or price per pound or ounce, if the net quantity of contents of the commodity is in terms of weight.

(b) Price per liter**,** ~~or~~ 100 mL, **cubic meter, cubic decimeter, or cubic centimeter,** or price per dry quart**,** ~~or~~ dry pint**, cubic yard, cubic foot, or cubic inch** if the net quantity of contents of the commodity is in terms of dry measure or volume.

(c) Price per liter or 100 mL, or price per gallon, quart, pint, or fluid ounce, if the net quantity of contents of the commodity is in terms of liquid volume.

(d) Price per individual unit or multiple units if the net quantity of contents of the commodity is in terms of count.

(e) Price per square meter, square decimeter, or square centimeter, or price per **100 square feet,** square yard, square foot, or square inch, if the net quantity of contents of the commodity is in terms of area.

(f) Price per meter, decimeter, centimeter or price per yard, foot, or 100 feet, or inch, if net quantity of contents of the commodity is in terms of length.

(g) Products such as wine and spirits must be unit priced in metric only in accordance with federal law.

(h) Unit pricing based on non-standard or ambiguous measures (e.g., "uses", "servings") is prohibited.

(Amended 2023 **& 202X**)

Section ~~3~~4. Exemptions

(~~a~~) ~~Small Packages. – Commodities shall be exempt from these provisions when packaged in quantities of less than 28 g (1 oz) or 29 mL (1 fl oz) or when the total retail price is 50 cents or less.~~

(~~b~~) ~~Single Items. – Commodities shall be exempt from these provisions when only one brand in only one size is offered for sale in a particular retail establishment.~~

(a) Infant Formula. – For "infant formula," unit price information may be based on the reconstituted volume. "Infant formula" means a food that is represented for special dietary use solely as a food for infants by reason of its simulation of human milk or suitability as a complete or partial substitute for human milk.

(b) Variety and Combination Packages. – Variety and Combination Packages as defined in Section 2.9 and Section 2.10 in the Uniform Packaging and Labeling Regulation [see ***Section ~~3~~4. NOTE***] shall be exempt from these provisions.

Section ~~3~~4. NOTE: See "Uniform Packaging and Labeling Regulation."

(Amended 202X)

Section 4~~5~~. Pricing

(a) The unit price shall be to the nearest cent when a dollar or more.

(b) If the unit price is under a dollar, it shall be listed:

(1) to the tenth of a cent; or

(2) to the whole cent.

The retail establishment shall have the option of using (b)(1) or (b)(2), but shall not implement both methods.

The retail establishment shall accurately and consistently use the same method of rounding up or down to compute the price to the whole cent.

Section ~~5~~6. Presentation of Price

(a) In any retail establishment **or e-commerce site** ~~in which~~ the unit price ~~information is provided in accordance with the provisions of this regulation, that information may~~ **shall** be displayed by means of a ~~sign~~ **display** that offers the unit price for one or more brands and/or sizes of a given commodity, by means of a sticker, stamp, sign, label, **ESL,** or tag affixed to the shelf **or adjacent to the product on an e-commerce site** upon which the commodity is displayed, or by means of a sticker, stamp, sign, label, or **ESL,** tag affixed to the consumer commodity**, and directly adjacent to the retail price**.

(b) Price per liter**,** ~~or~~ 100 mL, **cubic meter, cubic decimeter, or cubic centimeter,** or price per dry quart**,** ~~or~~ dry pint**, cubic yard, cubic foot, or cubic inch** if the net quantity of contents of the commodity is in terms of dry measure or volume.

(c) Price per liter or 100 mL, or price per gallon, quart, pint, or fluid ounce, if the net quantity of contents of the commodity is in terms of liquid volume.

(d) Price per individual unit or multiple units if the net quantity of contents of the commodity is in terms of count.

(e) Price per square meter, square decimeter, or square centimeter, or price per **100 square feet,** square yard, square foot, or square inch, if the net quantity of contents of the commodity is in terms of area.

(f) Price per meter, decimeter, centimeter or price per yard, foot, or 100 feet, or inch, if net quantity of contents of the commodity is in terms of length.

(g) Products such as wine and spirits must be unit priced in metric only in accordance with federal law.

(h) Unit pricing based on non-standard or ambiguous measures (e.g., "uses", "servings") is prohibited.

(Amended 202X)

Section ~~6~~7. Uniformity

(a) If different brands or package sizes of the same consumer commodity are expressed in more than one unit of measure (e.g., soft drinks are offered for sale in 2 L bottles and 12 fl oz cans), the retail establishment shall unit price the items consistently **in the same unit of measure**.

(b) When metric units appear on the consumer commodity in addition to other units of measure, the retail establishment **or e-commerce** site may include both units of measure on any stamps, ~~tags, labels, signs,~~ sign, label, **ESL,** tag or list.

(Amended 202X)

Section ~~7~~8. Effective Date

This regulation shall become effective on _____, 20__.

Given under my hand and the seal of my office in the City of _____ on this _____ day of _____, 20_____.

Signed _____

(Amended 1997 **& 202X**)

Previous Status:
2026: New Proposal

Original Justification:
Unit pricing has existed in the U.S.A. since the early 1970s, growing out of the "truth-in-labeling" era. Consumers demanded more information ("right to know") on labels to make informed purchase decisions. More recent innovations in retail sales, such as electronic shelf labels that utilize interactive devices such as QR codes, online advertising and sales, and related sales for pick up or delivery, and prices posted on applications that can be individualized to specific consumers, require new ways to inform consumers. Relatedly, evolutions in the retail marketplace have blurred the lines between traditional categories, with grocery, hardware, and even clothing stores offering products once exclusively sold by other categories of retailers, and have expanded the range of retailers concerned with disclosing unit prices. Consumers need unit pricing to make informed decisions about price and value comparisons for the products they are purchasing. Retailers also benefit when unit price labeling is implemented through improved pricing accuracy and greater inventory control, ultimately reducing the retailer's labor costs.

The submitter acknowledges that unit pricing has been in place for decades; the industry may not be ready to implement the additional requirements for e-commerce sites and technological advancements.

Comments in Favor:

Regulatory:
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Industry:
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Advisory:
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Comments Against:

Regulatory:
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Industry:
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Advisory:
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Neutral Comments:

Regulatory:
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Industry:
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Advisory:
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Item Development:
New Proposal

Regional Associations' Comments:
New Proposal

WWMA 2025 Annual Meeting:

No comments or status recommendation.

CWMA 2025 Interim Meeting:

Two regulators recommended developing on this item. It was suggested to receive input from more stakeholders. The CWMA L&R Committee recommends a developing status for this item.

NEWMA 2025 Interim Meeting:

No comments or status recommendation.

SWMA 2025 Annual Meeting:

Mr. Tory Brewer with the state of West Virginia recommends this item be given Informational status.

Mr. Mauricio Mejia, with the state of Florida, echoes West Virginia's comments.

The Committee admitted this item during open hearings and opened it for comments though it was not in the Laws & Regulations Committees agenda. The Committee recommends this item be added to the table of contents and therefore agenda at NCWM interim and recommends an Informational Status based on the comments received on the floor.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents.

FLR – UNIFORM FUELS AND AUTOMOTIVE LUBRICANTS REGULATION

FLR-26.1 7.2. Reproducibility Limits

Source:
Colorado Division of Oil and Public Safety

Purpose:
This proposal aims to clarify section 7.2.5. – Enforcement Action in the Uniform Fuels Regulation to address misleading and inadequate language from 2008.

Item under Consideration:
Amend NIST Handbook 130 Uniform Fuels and Automotive Lubricants Regulation as follows:

7.2. Reproducibility Limits.

7.2.1. AKI Limits. – When determining the antiknock index (AKI) acceptance or rejection of a gasoline sample, the AKI reproducibility limits as outlined in the latest version of ASTM D4814, "Standard Specification for Automotive Spark-Ignition Engine Fuel," Appendix X1 shall be acknowledged for enforcement purposes.

7.2.2. Reproducibility. – The reproducibility limits of the standard test method used for each test performed shall be acknowledged for enforcement purposes, except as indicated in Section 2.2.1. Premium Diesel Fuel and Section 7.2.1. AKI Limits. No allowance shall be made for the precision of the test methods for aviation gasoline or aviation turbine fuels.
(Amended 2008)

7.2.2.1 Enforcement Action. - To avoid the exploitation of a test method's reproducibility limits by any regulated party, the Director may initiate enforcement action when several independent test

results, of the same product sampled from the same source location at different times, are exceeding legal limits (such as specification values, posted values, certified values, or registered values). (Added 202X).

7.2.3. SAE Viscosity Grades for Engine Oils. – With the exception of the low-temperature cranking viscosity, all values required to define SAE Viscosity Grades, as defined in the latest version of SAE J300, "Engine Oil Viscosity Classification", are critical specifications as defined by the latest version of ASTM D3244, "Standard Practice for Utilization of Test Data to Determine Conformance with Specifications". (Added 2008) (Amended 2021)

7.2.4. Dispute Resolution. – In the event of a dispute over a reported test value, the guidelines presented in the latest version of ASTM D3244, "Standard Practice for Utilization of Test Data to Determine Conformance with Specifications," shall be used to determine the acceptance or rejection of the sample.

~~**7.2.5. Additional Enforcement Action. The Director may initiate enforcement action in the event that, based upon a statistically significant number of samples, the average test result for products sampled from the same source location is greater than the legal maximum or less than the legal minimum limits (specification value), posted values, certified values, or registered values. (Added 2008) (Amended 2018)**~~

Previous Status:

New Proposal

Original Justification:

Nationwide, all state jurisdictions that are adopting the fuel quality regulations of NIST HB 130 acknowledge reproducibility* limits of

analytical test methods for enforcement action purposes.

Though these reproducibility limits (R) are acknowledged by these state regulatory agencies authorized to assure fuel quality, the objective and intent for all parties involved is to meet legal requirements, not to exploit the space given between a legal limit and the (acknowledged) reproducibility limit.

With the intent to avoid the exploitation of such R values by any regulated party, section 7.2.5. – Additional Enforcement Action was originally published in 2008 and amended in 2018.

The applicable section currently reads:

"7.2.5. Additional Enforcement Action. The Director may initiate enforcement action in the event that, based upon a statistically significant number of samples, the average test result for

products sampled from the same source location is greater than the legal maximum or less than the legal minimum limits (specification value), posted value, certified values, or registered values."

However, the current language insufficiently articulates its intent, and obscures proper approach and conditional parameters. More specifically, the current Enforcement Action language does not articulate that its intent is to address situations where fuel quality characteristics are within reproducibility limits but often outside legal requirements. In addition, the language "the average test result for products sampled from the same source location" can mislead a regulatory agency to average a number of test results obtained from the same sample specimen**. However, "the average test result" shall be calculated from a number of independent test results obtained from independent sample specimens, each of which represent the same product, from the same location, sampled at different times. Finally, the word "additional" in the title "Additional Enforcement Action" implies that other enforcement action(s) already took place.

However, that won't be the case because in most scenarios no enforcement actions will have been taken after each individual sampling and testing event, because the regulating agency acknowledged reproducibility limits at the conclusion of each individual sampling and testing event though the single test result exceeded legal limits.

When these discrepancies were first brought to the Fuels and Lubricants Subcommittee's attention during the NCWM Interim Meeting in January of 2025, a focus group*** comprising of 13 diverse stakeholders from fuel industry and regulatory agencies was established. After email correspondence, two virtual meetings and an in-person meeting during the Annual NCWM Meeting in July of 2025, consensus on the following language was reached within the diverse focus group:

"To avoid the exploitation of a test method's reproducibility limits by any regulated party, the Director may initiate enforcement action when several independent test results, of the same product sampled from the same source location at different times, are exceeding legal limits (such as specification values, posted values, certified values, or registered values). (Added 202X)."

Consensus on the title and position within section 7. Test Methods and Reproducibility Limits were also reached by the focus group, and are as follows:

7.2.2.1. Enforcement Action

This title resolves the currently inaccurate title, and the sub-placement of this Enforcement Action regulation as 7.2.2.1 links it directly to its intended scope:

Section 7.2.2. Reproducibility.

In addition, Section 7.2.4. Dispute Resolution represents a process possibly necessary AFTER enforcement actions were initiated by a regulating agency. Hence, dispute resolutions should conclude Section 7. Test Methods and Reproducibility Limits, instead of end with 7.2.5 Additional Enforcement Action as currently published in HB 130.

* Reproducibility (R) of a standard test method is most often defined by the standard organization ASTM as the variability between single analytical test results obtained in different laboratories, each of which has applied the test method to test specimens taken from a single quantity of homogenous material.

** A sample specimen is a portion taken from a storage tank, truck, or dispenser, etc., is representative of a larger amount of product, and is used for testing to determine the quality, composition, as well as performance and safety suitability of a fuel product.

*** Enforcement Action Focus Group members: Kevin Adlaf, Vanessa Benchea, Scott Fenwick, Steven Harrington, Marilyn Herman, Randy Jennings, Russ Lewis, Vernon Miller, Timothy

Morales, Tamara Paik, Matthew Sheehan, and Jenny Tabbert.

It is not expected that there will be any opposition as this proposal is simply clarifying language in HB 130.

The submitter requested Voting status in 2026.

Comments in Favor:

Regulatory:

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Industry:

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Advisory:

Comments Against:

Regulatory:
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Industry:
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Advisory:
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Neutral Comments:

Regulatory:
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Industry:
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Advisory:
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Item Development:
New Proposal

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

The WWMA L&R Committee Chair Mr. Scott Wagner recused himself from the L&R working session for this item as he represents the submitter of this item.

Mr. Mahesh Albuquerque (Colorado Division of Oil and Public Safety) stated that Dr. Jenny Tabbert (Colorado) submitted this item and considers it a cleanup item which has been vetted by a focus group with FALS.

Mr. Matt Douglas (Representing the WWMA L&R Committee) asked a clarifying question regarding the omission of language regarding "…less than the legal minimum limits..." which appears in the current language but not in the proposal.

Mr. Randy Jennings (Vice Chair for FALS – temporarily performing the duties of the FALS Chair) responded to Mr. Douglas clarifying that the word "exceeding" is intended to be inclusive of "above" or "below" the legal limits. Mr. Jennings then provided comments that he was a participant in the 7.2 Reproducibility Limits Focus Group which held several meetings in the development of the proposed language. The Focus Group supports the item and it is his intention to meet with FALS after the regional meetings to seek consensus from FALS on this item. Mr. Jennings supported a voting status for this item.

Mr. Russ Lewis (Marathon Petroleum) stated that the "exceeding" language was reviewed by counsel as part of the development of the item and supported a voting status.

Mr. Matt Sheehan (Chevron) and Matt Douglas (California Division of Measurement Standards) also supported a voting status for this item.

The WWMA L&R Committee recommends a voting status.

CWMA 2025 Interim Meeting:

Ron Hayes, Retired, said the new language has become too specific and may change what FALS intended the language to be.

The CWMA L&R Committee recommends an informational status for this item.

NEWMA 2025 Interim Meeting:

No comments were heard during open hearings. The committee received a late submission of a supporting document indicating opposition to the item. The supporting document was not reviewed by the committee, but was subsequently posted to the NEWMA website.

As no comments were heard from the floor and the late supporting documents were not reviewed, the committee did not recommend a status for this item, and the body concurred.

SWMA 2025 Annual Meeting:

Mr. Randy Jennings, Vice-Chair of FALS, also temporarily performing the duties of FALS Chair, and a participant on the 7.2 Reproducibility Limits Focus Group commented that the Focus group chair Jenny Tabbert, CO, held several virtual meetings this semester that resulted in the development of the language as presented. The Focus Group Members support the amendment as presented and recommends a Voting Status. It is Mr. Jennings intent to convene a FALS virtual meeting after the Fall Regional meetings and prior to the NCWM Interim. The aim of this meeting will be to seek consensus on this item from FALS as a whole. With that being said, Mr. Jennings commented that they have received feedback from one FALS member expressing concerns with the amended language so this will need vetting within FALS and we will report the subcommittee status at the Interim.

Based on the comments made from the floor the Committee recommends this item an Assigned status.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents.

ECM – UNIFORM E-COMMERCE REGULATION

ECM-26.1 Section 2. Definitions, Section 3. Required Declarations for E-commerce Sites Offering Products for Sale, Section 5. Unit Pricing Requirements on E-Commerce Sites for Products Offered for Sale, Section 10. Prominence and Placement of Required Information on E-commerce Sites: Offering E-commerce Products for Sale

Source:
NIST Office of Weights and Measures

Purpose:
Adding unit pricing to e-commerce websites helps shoppers make more informed and cost-effective purchasing decisions by displaying the price per standardized unit of measure, such as per ounce, liter, or count, alongside the total product price. This transparency allows customers to easily compare the value of different product sizes, brands, and package types, ultimately fostering trust in the retailer. By simplifying comparison shopping, unit pricing can improve the user experience, encourage customer loyalty, and support better purchasing choices, while also aligning the platform with consumer protection best practices and potential regulatory requirements.

Item under Consideration:
Amend the Uniform E-commerce Regulation as follows:

Section 2. Definitions

…

2.21. **Unit Price – A Unit price is the cost per unit of measure of products, such as the cost per milliliter or per ounce.**

(Amended 202X)

…

Section 3. Required Declarations for E-commerce Sites Offering Products for Sale

3.1. E-commerce Site Requirements for Standard Packages. – The following shall apply to e-commerce sites on which standard packages are offered for sale:

(a) **Declaration of Identity.** – The product declaration of identity shall appear on the e-commerce site in a conspicuous and prominent location. Wherever applicable, the product brand name or manufacturer/distributor name shall be combined with the declaration of identity. This information shall be provided separately from and in addition to any picture or image of the product (See Section 7 Declaration of Identity: E-commerce Products for additional information.)

(b) Declaration of Unit Price - The unit price of the product shall appear on the e-commerce site in a conspicuous and prominent location. This information shall be provided separately from and in addition to any picture or image of the product (See Section 5. Unit Pricing Requirements on E-Commerce Sites for Products Offered for Sale for additional information).

(c) **Declaration of Net Quantity.** – The declaration of net quantity shall appear on the e-commerce site in a prominent location and in a conspicuous manner which clearly communicates the package net quantity. This information shall be provided separately from and in addition to any picture or image of the product. This information shall be provided in both U.S. customary and SI units for products subject to the Fair Packaging and Labeling Act or as mandated for products under other Federal regulations (See Section 6. Declaration of Quantity – E-commerce Products for additional information.)

(d) **Product Price.** – The price of the product shall appear on the e-commerce site in a conspicuous and prominent location. Added cost information (if any) for shipping, delivery, taxes, and other services shall be provided to the customer prior to the completion of check-out and payment.

(e) **Product Photo or Visual Product Representation/Image.** – The e-commerce site shall provide a photo or visual representation (image) of the product to help consumers confirm the identity of the item they intend to purchase. While a product photo or image may show certain required information, required information shall appear separately from the picture/representation. Any information provided in the picture/image shall not conflict with information required by this regulation (See Section 9. Product Photograph or Accurate Product Depiction/Representation: E-commerce Site Requirements for additional information).

(f) **Brand Name or Product Manufacturer.** – The e-commerce site shall provide the name of the manufacturer, distributor or the brand of any product offered for sale, where applicable (See Section 8. Declaration of Responsible Person: E-commerce Products for additional information.)

(Amended 20XX)

…

Section 5. Unit Pricing Requirements on E-Commerce Sites for Products Offered for Sale

5.1. Products Subject to Unit Pricing on E-commerce Sites.

~~(a)~~ Unit price information is required for bulk products ~~and~~**along** with **standard and** random packages offered for sale on an e-commerce site.
(Amended 20XX)

~~**(b) Unit price information is optional for standard packages offered for sale on e-commerce sites.**~~

5.2. Required Unit Price Information. – The unit price shall be consistent with the required method of sale for the product. An e-commerce site shall determine the most effective units for ensuring value comparison of similar products with varying product sizes. Unit prices shall employ consistent units of measure for similar or competing products posted on the same e-commerce site (e.g., price per ounce, price per inch, etc.) **(See Notes 1 & 2)**

(a) The declaration of the unit price of a particular commodity in all package sizes offered for sale on an e-commerce site shall be uniformly and consistently expressed in terms of:

(1) Price per kilogram or 100 g, or price per pound or ounce, if the net quantity of contents of the product is in terms of weight.

(2) Price per liter, or 100 mL, **cubic meter, cubic decimeter, or cubic centimeter,** or price per dry quart, or dry pint**, cubic yard, cubic foot, or cubic inch** if the net quantity of contents of the product is in terms of dry measure or volume.

(3) Price per liter or 100 mL, or price per gallon, quart, pint, or fluid ounce, if the net quantity of contents of the product is in terms of liquid volume.

(4) Price per individual unit or multiple units if the net quantity of contents of the product is in terms of count.

(5) Price per square meter, square decimeter, or square centimeter, or price per **100 square feet,** square yard, square foot, or square inch, if the net quantity of contents of the product is in terms of area.

(6) Price per meter, decimeter, centimeter, or price per yard, foot, 100-feet, or inch if the net quantity of contents of the product is in terms of length.

(b) The following exemptions from unit pricing requirements above are permitted:

~~(1) **Small Packages.** Products shall be exempt from these provisions when packaged in quantities of less than 28 g (1 oz) or 29 mL (1 fl oz) or when the total retail price is 50 cents ($0.50) or less.~~

~~(2) **Single Items.** Products shall be exempt from these provisions when only one brand in only one size is offered for sale in a particular retail establishment.~~

(3) **Infant Formula.** – For "infant formula," unit price information may be based on the reconstituted volume. "Infant formula" means a food that is represented for special dietary use solely as a food for infants by reason of its simulation of human milk or suitability as a complete or partial substitute for human milk.

(4) **Variety and Combination Packages.** – Variety and Combination Packages as defined in Section 2.9. Combination Package and Section 2.10. Variety Package in the UPLR [see **Section 5.** ***NOTE***] shall be exempt from these provisions.

(c) Unit pricing expressions shall be listed to the nearest cent when it is a dollar or more. If the unit price is under a dollar, it shall be listed to the tenth of a cent or the whole cent, but both methods cannot be used simultaneously. The e-commerce site shall be accurate and consistently use the same method of rounding to compute the unit price to the whole cent.

(d) The unit price information shall be displayed adjacent to the product pricing information.

Section 5. NOTE 1: See NIST Handbook 130, Uniform Packaging and Labeling Regulation.

***Section 5. NOTE 2*: See NIST Handbook 130 Uniform Unit Price Regulations.**

(Amended 202X)

…

Section 10. Prominence and Placement of Required Information on E-commerce Sites: Offering E-commerce Products for Sale

10.1. GENERAL REQUIREMENTS. – All information required to appear on the e-commerce site which offers products for sale shall appear thereon in the English language and shall be prominent, definite, plain, and conspicuous as to size and style of letters and numbers and as to color of letters and numbers in contrast to color of background. Any required information that is either in hand lettering or hand script shall be entirely clear and equal to printing in legibility.

Location. – The required e-commerce site declarations below shall be present in the top 50 % the screen in which the product is offered for sale:

(1) identity;

(2) net quantity;

(3) product price;

(4) brand or manufacturer name; and

(5) package picture or photographic representation/depiction.

(6) Unit Price

(a) **Style of Type or Lettering.** – The required e-commerce site declarations shall be in such a style of type or lettering as to be boldly, clearly, and conspicuously presented with respect to other type, lettering, or graphic material on the screen.

(b) **Color Contrast.** – The required e-commerce site declarations shall be in a color that contrasts conspicuously with its background.

(c) **Package Picture or Photographic Representation.** – The product picture or photographic depiction shall be in the actual colors of the package or product. Slight variations in color shading are acceptable.

(Amended 20XX)

Previous Status:
New Proposal

Original Justification:
Including unit pricing on e-commerce websites is justified because it directly addresses the common challenge consumers face in comparing product value across varying package sizes and brands. Without a standardized cost per unit, shoppers may unintentionally overpay or overlook better-value options. Unit pricing eliminates ambiguity, enabling data-driven purchasing decisions that can lead to increased customer satisfaction and stronger brand loyalty. Additionally, many consumer advocacy groups and regulatory bodies promote or mandate unit pricing as a best practice, meaning its adoption can help ensure legal compliance while signaling a retailer's commitment to transparency and fairness in pricing.

The submitter acknowledged that Integrating accurate unit pricing can be complex, especially across thousands of products with varying packaging sizes and units. Ensuring consistency and correctness may require significant technical investment, increasing retailers' operational costs.

The submitter requested Voting status in 2026.

Comments in Favor:

Regulatory:
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Industry:
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Advisory:
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Comments Against:

Regulatory:
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Industry:
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Advisory:
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Neutral Comments:

Regulatory:
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Industry:
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Advisory:
•

Item Development:
New Proposal

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

Mr. Kurt Floren (County of Los Angeles, California) made a statement recognizing that this item for unit pricing in e-commerce is being considered for adoption while unit pricing for physical retail locations is not uniformly adopted; however, there is a difference in the ease of making sufficient and adequate cost comparisons in-person as opposed to online. For that reason, he supports the item.

Mr. Jose Arriaga (County of Orange, California), Mr. Aaron Yanker (Colorado Department of Agriculture, Weights and Measures), and Mr. Matt Douglas (California Division of Measurement Standards) all joined in supporting the item for voting status.

The WWMA L&R Committee recommends a voting status.

CWMA 2025 Interim Meeting:

Ivan Hankins, IA, and Shelly Miller, WI-Retired, both supported this itemThe CWMA L&R Committee recommends a voting status for this item.

NEWMA 2025 Interim Meeting:

Regulators from Vermont and New York commented that they support the item. A regulator from New Jersey commented that the item has merit and keeping the online spaced consistent with the brick-and-mortar space is always a good idea. However, the only issue envisioned is continuity of enforcement with states that have separate unit pricing regulations that may not be in line with this model regulation. New Jersey recommended a Developing status.

After hearing comments from the floor, the committee recommended a Developing status, and the body concurred.

SWMA 2025 Annual Meeting:

The Committee received no comments made during open hearing.

The Committee heard no opposing nor supporting comments during open hearings. The submitter was not present. The Committee believes this item needs to be further vetted by the NCWM membership and recommends a Developing status.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents.

OTH – OTHER ITEMS

OTH-24.1 A X. Uniform Shipment Law

Source: New Hampshire Weights and Measures

Purpose:
Provide model law language to address the shipment of goods.

Item under Consideration:
Adopt a new Handbook 130 Uniform Shipment Law as follows:

X. Uniform Shipment Law

Section 1. Purpose

To ensure transparent, equitable, and accountable shipment practices concerning the weight, measure, and freight classification of shipped goods.

Section 2. Scope

This Act:

(a) establishes an enforcement program;
(b) empowers the state to promulgate regulations as needed to carry out the provisions of the Act;
(c) provides for civil and criminal penalties.

Section 3. Definitions

As used in this Act:

3.X. Bill of Lading (BOL) / Waybill. – A legal instrument used in the transportation and shipment industries which lists the goods being shipped and the terms under which they will be delivered.

3.X. Carrier. – The business that transports an amount of goods.

3.X. Carrier Inspection Certificate. – A document used to signify that shipped goods have been inspected pertaining to, but not limited to, classification, density, weight, or measure.

3.X. Freight Class. – A system that groups freight into categories based on four factors: density, handling, stowability, and liability.

3.X. Goods. – All things which are movable and can be transported.

3.X. Handling Unit. – A single item or group of items that are packaged together and handled as a single unit throughout the shipping process. Handling units refer to packages or containers. These units are designed to facilitate the efficient and safe transportation, storage, and management of goods. They can vary in size and form.

3.X. Measuring System. – A set of devices and affiliated software used to measure and record the quantity, weight, volume, or size of goods. This includes all parts of the system, as well as where recorded representations are determined, and shall be approved for use by the state enforcement official in accordance with accepted standards.

3.X. National Motor Freight Classification (NMFC) Code. – A numeric code used in the U.S. freight industry to classify goods for shipping.

3.X. Progressive Number (Pro / Tracking Number). – A unique numeric identifier issued by a carrier for identification and tracking of a shipper's specific order.

3.X. Quote. – A competitively solicited offer to furnish supplies or services by a method of procurement that is less formalized than a bid or a proposal.

3.X. Shipment. – A quantity of goods shipped with a carrier.

3.X. Shipper. – Individuals or businesses that send or request goods using a carrier.

3.X. Terminal or Service Center. – A facility designated for managing and coordinating the movement of trucks and goods, and may facilitate the assessment of goods for weight, measure, and freight classification.

3.X. Third-Party Logistics (3PL) Provider / Shipping Broker / Freight Forwarder. – An intermediary between the shipper and the carrier who coordinates and facilitates the transportation of goods and may include the arrangement of the import and export of cargo.

3.X. Unique Identifier. – A distinct code or number assigned to an individual, entity, document, or item that differentiates it from all others in a system.

3.X. Director. – The of the Department of .

Section 4. Enforcing Official: Rules and Regulations

The Director is authorized to:

- **(a) enforce the provisions of this Act;**
- **(b) issue reasonable regulations for the enforcement of this Act that shall have the force and effect of law; and**
- **(c) adopt rules that include, but are not limited to;**
  - **(1) adherence to the provided written quote from either the carrier or 3PL is required, contingent upon the shipper supplying accurate and complete documentation pertaining to the shipment;**
  - **(2) the weighing, measuring, and freight class accuracies that must be followed;**
  - **(3) the required information that shall be submitted by both the carrier and 3PL to the shipper, if a correction is applied; and**
  - **(4) the period of recordkeeping in accordance with Title 49 Subtitle B Chapter III Subchapter B Part 379 Appendix A;**

Section 5. Weighing and Measuring Practices and Equipment Used

All entities, including but not limited to, shippers, 3PL's, or carriers, shall use weighing and measuring practices and equipment:

- **(a) in accordance with the requirements of the latest edition of NIST Handbook 44, "Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices"; and**
- **(b) that have been examined, tested, and approved for use by either a weights and measures official or authorized service provider. In the absence of an applicable NTEP program for said device, it shall be used in accordance with the manufacturer's approved application.**

Section 6. Weighing Device Used

All entities, including but not limited to shippers, 3PLs, or carriers, shall use an NTEP-approved weighing device. In the absence of an applicable NTEP program for said device, it shall be used in accordance with the manufacturer's approved application.

Section 7. Measuring Device Used

All entities, including but not limited to shippers, 3PLs, or carriers, shall use an NTEP-approved measuring device. In the absence of an applicable NTEP program for said device, it shall be used in accordance with the manufacturer's approved application.

Section 8. Carrier Inspection Certificate - Required Entries

- **(a) The documentation, when properly completed and signed, including digital signatures, shall be prima facie evidence of the accuracy of the recorded results and procedures followed.**

(b) The recorded information to be provided on the documentation shall be prescribed by the Director and will include, but not be limited to, the following:

(1) employee identifier of the individual(s) who conduct(s) the inspection;
(2) date and time of the inspection;
(3) identifying information for the issuing terminal to include physical address and contact information;
(4) unique identifier of the weighing or measuring device used to conduct the inspection;
(5) indicated reweigh or remeasure value from the weighing device or measuring device for each handling unit;
(6) indicated NMFC code and commodity description related to freight class for each handling unit or shipment correlating to a change in weight, measure, or density;
(7) identifying information for both the Pro Number and BOL, if applicable; and
(8) name and address of the shipper from the point of origin.

Section 9. Copies of Carrier Inspection Certificates

The carrier and 3PL shall keep and preserve for the period of two years, a legible copy of each inspection certificate issued to the shipper. The certificates, as required in Section 8. Carrier Inspection Certificate - Required Entries, shall be available for inspection within 48 hours by a weights and measures official during normal business hours.

Section 10. Prohibited Acts

It shall be unlawful if any entity:

(a) violates any provisions of this Act or any regulation promulgated under this Act, with intent to defraud; or

(b) knowingly or with intent to defraud -

(1) provides a false commodity description, freight class, NMFC code, density, weight, or measurement either orally or written;

(2) satisfies fewer than all requirements of this Act as stated in Sections 5, 6, 7, 8, and 9;

(3) hinders or obstructs in any way the Director or their authorized agent in the performance of the Director's official duties under this Act;

(4) uses or have in their possession a measuring system or any of its components that have been designed, modified, or used to facilitate fraud, or that has not been approved for commercial use by a weights and measures agency and/or official, or other authorized regulatory authority having jurisdiction over the measuring system.

Removed (5) language which mimicked 10 (a).

Section 11. Civil Penalties

11.1. Assessment of Penalties. – Any entity who by themselves or by their servant or agent commits any of the acts enumerated in Section 10. Prohibited Acts may be assessed by the _____ a civil penalty of:

(a) not less than $ nor more than $ for a first violation,
(b) not less than $ nor more than $ for a second violation within from the date of the first violation, and
(c) not less than $ nor more than $ for a third violation within from the date of the first violation.

11.2. Administrative Hearing. – Any entity subject to a civil penalty shall have a right to request an administrative hearing within _____ days of receipt of the notice of the penalty. The Director or their designee shall be authorized to conduct the hearing after giving appropriate notice to the respondent. The decision of the Director shall be subject to appropriate judicial review.

11.3. Collection of Penalties. – If the respondent has exhausted their administrative appeals and the civil penalty has been upheld, they shall pay the civil penalty within _____ days after the effective date of the final decision. If the respondent fails to pay the penalty, a civil action may be brought by the Director in any court of competent jurisdiction to recover the penalty. Any civil penalty collected under this Act shall be transmitted to _____.

Section 12. Criminal Penalties

12.1. Misdemeanor. – Any entity who by themselves or by their servant or agent commits any of the acts enumerated in Section 10. Prohibited Acts or violates any other provision of this Act shall be guilty of a Class _____ misdemeanor and upon conviction shall be punished by a fine not less than $_____, nor more than $_____, or by imprisonment for not less than _____ nor more than _____, or both fine and imprisonment.

12.2. Felony. – Any entity who by themselves or their servant or agent who intentionally commits any of the acts enumerated in Section 10. Prohibited Acts or repeatedly violates any other provision of this Act shall be guilty of a Class _____ felony and upon conviction shall be punished by a fine not less than $_____ and/or by imprisonment for not less than _____, nor more than _____.

Section 13. Restraining Order and Injunction

The Director is authorized to apply to any court of competent jurisdiction for a restraining order, or a temporary or permanent injunction, restraining any person from violating any provision of this Act.

Section 14. Validity of Prosecutions

Prosecutions for violation of any provision of this Act are declared to be valid and proper notwithstanding the existence of any other valid general or specific Act of this state dealing with matters that may be the same as or similar to those covered by this Act.

Section 15. Severability Provision

If any provision of this Act is declared unconstitutional, or the applicability thereof to any person or circumstance is held invalid, the constitutionality of the remainder of the Act and the applicability thereof to other persons and circumstances shall not be affected.

Section 16. Repeal of Conflicting Laws

All laws and parts of laws contrary to or inconsistent with the provisions of this Act, and specifically _____, are repealed insofar as they might operate in the future; but as to offenses committed, liabilities incurred, and claims now existing there under, the existing law shall remain in full force and effect.

Section 17. Citation

This Act may be cited as the "Shipment Act of _____."

Section 18. Effective Date

This Act shall become effective on _____.

Source:
New Hampshire Department of Agriculture, Markets & Food

Previous Status:
2025: Assigned to the Uniform Shipping Law Task Group
2024: Assigned to the Uniform Shipping Law Task Group

Original Justification:
Current shipping practices may result in incorrect overcharges and misleading pricing. It has been documented through investigations that carriers or freight brokers have incorrectly billed shippers on goods shipped. Documentation provided by carriers to both shippers and weights and measures officials lack relevant information needed to fully investigate complaints within the shipping industry.

Carriers may have language in their contracts that inform the shipper of possible audits of their shipped goods and subsequent correction and audit fees.

The submitter requested Voting status in 2024.

Comments in Favor:

Regulatory:

- 2025 Interim: Ms. Cheryl Ayer, New Hampshire stood in support of the item and stated that discussion between the States with industry was attempted but no one from industry came forward. She addressed a concern expressed during the industry presentation that the problem is primarily due to bills of lading not being properly completed. Ms. Ayers said that bills of lading are required to be filled out. Shippers are picking up incomplete or accurate bills of lading. Carriers need to ensure these are filled out prior to picking up the shipment. The Task Group has done its work, and the item is ready for voting.

- 2025 Interim: Mr. Aaron Yanker, Colorado, asked the Task Group for clarification, specifically if the Task Group has considered only LTL or all shipments. He went on to say that Colorado is in strong favor of the item and asked that the Task Group task consider all freight.

- 2025 Interim: Mr. Jason Flint, New Jersey, said the Task Group did a good job. He further stated that regulation may be needed through the roles of US legislature.

- 2025 Interim: The Committee heard from several other weights and measures officials who expressed general support and continued development of the item.

Industry:

- None

Advisory:

- None

Comments Against:

Regulatory:

- None

Industry:

- 2025 Interim: During a presentation made by Mr. Jeff Cooper and Ms. Claire Shapiro, National Motor Freight Transportation Association (NMFTA) they shared that a shipping class is given for LTL shipments. Some loads are not marked, so carriers must inspect and assign even if shipper is not paying, and the consignee is charged. Freight charges are adjusted if shipments are not marked accurately. Carriers have dispute resolution policies for adjustments. They recommended that the item be withdrawn or remain developing.

Advisory:

- None

Neutral Comments:

Regulatory:

- None

Industry:

- None

Advisory:

- 2025 Interim: Mr. Rowan Hemsing, Measurement Canada, informed the Committee that Canada intends to implement a similar approach to clarify roles and responsibility.

- 2025 Interim: Mr. John McGuire, NIST OWM, stated that the item should be Informational or maintain its Assigned status because of the substantial changes to the item.

Item Development:

NCWM 2025 Annual: The Item is Assigned so the Committee heard comments only from the Task Group Chair Mr. Miland Kofford. Mr. Kofford told the Committee that the task group continues working on and developing this item.

The task group has submitted new language for this item and is available on the NCWM website under supporting documents dated July 9, 2025. The Committee has not reviewed or considered this language.

NCWM 2025 Interim: The Committee received a revision of the proposal during the NCWM 2025 Interim meeting. It appears above in this report and is the version being considered. The previous version can be found in NCWM 2025 Publication 15.

Contact: Miland Kofford, Chair – Uniform Shipment Law Task Group
mkofford@utah.gov

During the 2025 Interim open , the Committee heard from representatives of the shipping industry that they were in general support of this item but had some suggestions for the task group to consider.

For this reason, and because changes were made to the item during the 2025 Interim, the Committee has maintained the Assigned status for this item. This will allow interested parties to review the most recent version of the item and for the Task Group to solicit input from industry stakeholders and other interested parties.

NCWM 2024 Annual: The Committee took no action and did not make any changes to this item.

NCWM 2024 Interim: The submitter made a presentation on this item and the Committee heard support for the item, but recognizing it is not fully developed will request to assign it to the newly formed Uniform Shipment Law Task Group.

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

The current version of this proposal was not included in the L&R committee's agenda and appears as a separate item on the WWMA website.

Mr. Miland Kofford (representing both the Utah Department of Agriculture and Food, and Chair of the Uniform Shipping Law Task Group) stated that the task group received feedback at the interim meeting, has worked to update the item over the last 6 months, and feels the item is ready for a vote.

Mr. Kurt Floren (County of Los Angeles, California) recommended further development. He stated that it is unclear where this item was intended to be placed. The stated purpose of the item is to adopt a new law, but Mr. Floren suggested that it may be better suited in the existing HB 130 Chapter III, Uniform Laws.

Mr. Aaron Yanker (Colorado Department of Agriculture, Weights and Measures), and Mr. Matt Douglas (California Division of Measurement Standards) both expressed appreciation for the work done by the task group but still recommended an assigned status.

The WWMA L&R Committee recommends a voting status with the recommendation that the task group incorporates Mr. Kurt Floren's suggestion.

CWMA 2025 Interim Meeting:

The Committee recommends this item to be informational as it is developed. No input from industry has been received outside of the task group.

NEWMA 2025 Interim Meeting:

A regulator from New Hampshire (and Uniform Shipping Law Task Group member) commented they believe the item is ready for a vote. She indicated that changes were made between the 2025 Interim and Annual, taking into consideration recommendations from industry, namely the NMFTA. She also commented that the Task Group is looking to develop a uniform regulation in the future.

After hearing comments from the floor, the committee believes this item is fully developed and recommended a Voting status; and the body concurred.

SWMA 2025 Annual Meeting:

The Committee received no comments made during open hearing.

The Committee did not receive an update from the work group this item was assigned to. The submitter was not present. The Committee believes this item needs to be further vetted by the NCWM membership and recommends this item remain Assigned.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents.

OTH-07.1 D Fuels and Lubricants Subcommittee

Source:
NCWM Fuels and Lubricants Subcommittee (FALS)

Purpose:
Provide an update of the activities of this Subcommittee which works on direction from and reports to the L&R Committee. The mission of FALS is to assist the L&R Committee in the development of agenda items that affect Handbook 130, Uniform Fuels and Automotive Lubricants Inspection Law and Uniform Fuels and Automotive Lubricants Regulation. The Subcommittee consists of regulators and associate members who have subject matter expertise in fuels and lubricants. The Subcommittee will be called upon to aid in the development, provide guidance, and help establish NCWM position on items concerning fuels and lubricants.

Item Development:

NCWM 2025 Annual: Mr. Randy Jennings, FALS member, updated the Committee on behalf of Ms. Vanessa Benchea, FALS Chair, on the FALS activities. Mr. Jennings also provided the following written report to the Committee.

This report outlines the activities of the Fuels and Lubricants Subcommittee (FALS), which reports to and provides recommendations for the Laws and Regulations Committee.

For further information or to provide comments, please contact the FALS Chair:

Ms. Vanessa Benchea, FALS Chair
Florida Department of Agriculture/Division of Consumer Services
813-868-8263
Vanessa.Benchea@fdacs.gov

FALS convened on Sunday, July 13, 2025, at the 2025 NCWM Annual Meeting in Reno, Nevada, with approximately 35 members and guests in attendance. The purpose of this meeting was to review items related to fuel and automotive fluid standards that appear on the L&R agenda, along with items of old and new business.

Block Item 1, Block Item 2, and FLR-25.2 were discussed. Updates from ASTM D02 subcommittees A (Gasoline and Oxygenated Fuels), E (Burner, Diesel, and Non-Aviation Gas Turbine Fuels), which included a detailed presentation on diesel dispenser filter plugging field issues, and J (Aviation Fuels) were provided, followed by a discussion led by Jenny Tabbert, Colorado, regarding the use of nozzle extenders when collecting volatile liquid fuel samples.

One item of new business addressed feedback from the FALS Tractor Hydraulic Fluid Focus Group in response to an ASTM inquiry regarding the need for an ASTM standard for off-warranty Tractor Hydraulic Fluids (THF). The FALS Focus Group concluded, “There appears to be no practical need for ASTM to proceed unless the group feels that resources should be spent on an outlier situation, potentially detracting from the existing regulations that are working as intended.”

Old business included a report from Jenny Tabbert, Colorado, Focus Group Chair, on the Uniform Regulation section 7.2.5, “Additional Enforcement Action.” Focus Group discussions were summarized, and the Focus Group will continue to address this item in the coming semester. Prentiss Searles, API, presented on Density Correction/Compensation activities.

Regarding Item FLR-25.2, Uniform Regulation section 7, Test Methods and Reproducibility Limits, FALS discussed a possible amendment or editorial change to remove the definition for Thermal Stability, along with the published proposal that deletes obsolete information covered in this item. The rationale is that, should this item pass during the Annual Meeting, “Thermal Stability” would remain a legacy definition in the document but without attribution. The FALS membership in attendance fully supported the removal of this definition, either through an L&R amendment to this item or editorially, along with continued support for this voting item.

If the recommendation to editorially or amend in order to remove the definition of Thermal Stability is accepted, the complete item will be:

Section 1. Definitions

1.53. Thermal Stability. - The ability of a fuel to resist the thermal stress which is experienced by the fuel when exposed to high temperatures in a fuel delivery system. Such stress can lead to formation of insoluble gums or organic particulates. Insolubles (e.g., gums or organic particulates) can clog fuel filters and contribute to injector deposits. (Added 1998) (Amended 1999 and 2018)

Section 7. Test Methods and Reproducibility Limits

7.1. ASTM Standard Test Methods. – ASTM Standard Test Methods referenced for use within the applicable Standard Specification or as otherwise specified in these regulations shall be used to determine the specification values for enforcement purposes.
7.1.1. Premium Diesel. – The following test methods shall be used to determine compliance with the premium diesel parameters:

(a) Cetane Number. – The latest version of ASTM D613, "Standard Test Method for Cetane Number of Diesel Fuel Oil";
(b) Low Temperature Operability. – The latest version of ASTM D4539, "Standard Test Method for Filterability of Diesel Fuels by Low-Temperature Flow Test (LTFT)" or ASTM D2500, "Standard Test Method for Cloud Point of Petroleum Products" (according to marketing claim);
(c) Thermal Stability. – The latest version of ASTM D6468, "Standard Test Method for High Temperature Stability of Middle Distillate Fuels" (180 min, 150 °C); and
(d) Lubricity. – The latest version of ASTM D6079, "Standard Test Method for Evaluating Lubricity of Diesel Fuels by the High Frequency Reciprocating Rig (HFRR)."
(Amended 2003 and 20XX)

7.2.2. Reproducibility. – The reproducibility limits of the standard test method used for each test performed shall be acknowledged for enforcement purposes, except as indicated in Section 2.2.1. Premium Diesel Fuel and Section 7.2.1. AKI Limits. No allowance shall be made for the precision of the test methods for aviation gasoline or aviation turbine fuels.
(Amended 2008 and 20XX)
Detailed minutes of this meeting will be distributed to FALS membership, including attachments with all presentations from the meeting.

NCWM 2025 Interim: Ms. Vanessa Benchea, FALS Chair updated the Committee during Open Hearings on the FALS activities. Ms. Benchea also provided the following written report to the Committee.

This item is to provide a report on the activities of the Fuels and Lubricants Subcommittee (FALS), which reports and provides recommendations to the Laws and Regulations Committee.

For more information or to provide comments please contact:

Ms. Vanessa Benchea, FALS Chair
Florida Department of Agriculture/Division of Consumer Services
813-868-8263, Vanessa.Benchea@fdacs.gov

FALS met on Sunday, January 12, 2025, at the 2025 NCWM Interim Meeting in Charleston, South Carolina to review items related to fuel and automotive fluid standards that appear on the L&R agenda. Block Item 2 (currently assigned to FALS), item FLR-25.2 and block item 1 were discussed. Updates from ASTM D02 subcommittees A and E and for the EV Fluids Focus Group were provided along with a follow up discussion regarding extension nozzles.

Items of new business such as codifying the use of the excess volume correction factor for gasoline ethanol blends and the intent of the current the language in section 7.2.5. Additional Enforcement Action were discussed and resulted in the beginning formations of focus groups for further development.

For Item Block 2 (B2) Reference ASTM Standards D8080 and D8487, the subcommittee discussed the recommended language as provided by NIST and believes this item is fully developed and ready to vote with the

addition of "the latest version of" placed ahead of "ASTM D8080" and reads as follows with the additional recommendation as highlighted below:

3.11.2.1.X. Identification of Grade. – Each retail dispenser of CNG shall be labeled with an identification of the grade of the product as identified in the latest version of ASTM D8080.

3.12.2.X. Identification of Grade. – Each retail dispenser of LNG shall be labeled with an identification of the grade of the product as identified in the latest version of ASTM D8080.

For Item FLR-25.2 7. Test Methods and Reproducibility Limits, Randy Jennings provided a brief overview of his proposal to remove redundant and outdated language regarding Premium Diesel specifications.

The Subcommittee feels this item is fully developed and is ready for a vote.

For Item Block 1 (B1) Premium Diesel Fuel, the Subcommittee had no additional discussion regarding this item and recommends the language developed from their virtual meeting held December 20, 2024, which adds "When Cloud Point determinations are made," to the language changes that came out of the regionals and reads as follows:

"NOTE: When Cloud Point determinations are made**,** ASTM D2500, "Standard Test Method for Cloud Point of Petroleum Products and Liquid Fuels" is the referee method, however, bias-corrected results from the automatic Standard Test Methods listed in the latest version of ASTM D975, "Standard Specification for Diesel Fuel" may be used as alternatives with the same limits. Bias-correction equations are noted in the respective precision sections of each automatic test method. In case of dispute, ASTM Test Method D2500 shall be the referee method."

The Subcommittee feels this language is now fully developed and ready for a vote.

ASTM D02.A – D4814 Updates

Marilyn Herman addressed the subcommittee and provided an update on ASTM Subcommittee A related activities that included an overview of states that have adopted a newer version of D4814 that addressed the significant changes to the volatility specifications.

ASTM D02.E Updates

Randy Jennings provided an update on ASTM Subcommittee E's activities that included the ongoing streamlining efforts of combining D7467 (Standard Specification for Diesel Fuel Oil, Biodiesel Blends (B6-B20)) and D975 (Standard Specification for Diesel Fuel), lubricity precision, the withdrawal of ASTM D8181, the necessity of higher quality fuel be driven by low emission engines, and the need for a specification regarding higher biodiesel blends.

Electric Vehicle Fluids Focus Group

The EV Fluids Focus Group met twice to discuss the fluid requirements for electric vehicles (EVs) including coolant, transmission fluid, gear fluid, and greases, and the extent to which they differ from internal combustion engine (ICE) fluids currently regulated by NIST Handbook 130. The FG intends to survey state regulators to determine how many jurisdictions currently have authority to regulate EV fluids and which ones will need enabling legislation. Since consensus standard setting is still in the developing process determining necessary standard references for EV fluid labels is still premature. However, certain issues with labels could be addressed such as (a) how best to provide application information; (b) the distinction between EV transmission fluid versus gear fluid; and (c) the potential problematic use of references to “universal” or “all” with respect to coolant given that automakers have different standards for EV coolant versus ICE coolant. The FG is in the process of collecting label samples from current products in the marketplace.

The FG also feels that coordinating an effort from the OEMs into using a single description for EV coolant and that making a bright line distinction between EV transmission fluid versus EV gear fluid would decrease opportunities for confusion. The group believes it would be easier for consumers, for instance, to have a category called "EV coolant" rather than various descriptions including "designated coolant water," which is used by at least one OEM.

If there are questions and if anyone would like to participate in the focus group, please reach out to myself, Vanessa Benchea or Joanna Johnson.

Extension Nozzles
There was a small follow up discussion regarding the use of an extension nozzle during sampling of gasoline products. Russ Lewis (Marathon Petroleum) will provide a contact for Dr. Tabbert to obtain the previous study performed back in the 90’s. Dr. Tabbert still requests a survey of what other states with fuel quality programs are doing.

Codification of API MPMS CH 11.3.4 (Excess volume correction factor at wholesale for gasoline ethanol blends) – Prentiss Searles (API) and Steve Carter (IL) briefly discussed their presentations provided at the Meter Manufacturers Association on how to accommodate physical changes to products after they have passed a custody meter where volumes on the Bill of Ladings and invoices may not match without the application of a correction factor to account for the volume expansion. Prentiss Searles is forming a work group to address this in Handbook 44.

7.2.5. Additional Enforcement Action - Dr. Jenny Tabbert (CO) presented concerns she had regarding section 7.2.5. Additional Enforcement Action from the Uniform Fuels and Automotive Lubricants Regulation that covers the applicability of enforcement actions regarding consistently low or high results from the same facility respective to the specification but within reproducibility limits. The language as written did not seem to address this concern for many, specifically out of context. Randy Jennings, the originator of the language, provided historical knowledge and the intent with which it was written. A focus group had formed to address this concern and possibly provide updated language to lessen any future confusion.

Regional Associations’ Comments:

<u>WWMA 2025 Annual Meeting:</u>

Mr. Randy Jennings (Vice Chair of FALS) stated that there is no new business to report and that an update will be provided in January.

The WWMA L&R Committee thanks the Fuels and Lubricants Subcommittee for its work and recommends this item remain developing.

<u>CWMA 2025 Interim Meeting:</u>

No comments.

The CWM L&R Committee recommends a developing status for this item.

NEWMA 2025 Interim Meeting:

No comments were heard on this item. As this is a standing subcommittee report, the committee recommended a Developing status, and the body concurred.

SWMA 2025 Annual Meeting:

Mr. Randy Jennings, FALS Vice Chair — commented that other than the information presented for FLR-26.1, the group does not have any additional information to report at this time. In addition to the Virtual Meeting that we will hold prior to the Interim, FALS will meet in-person at the NCWM Interim meeting and an update will be provided to the NCWM L&R Committee during the open hearings.

The Committee recommends this item remain Developing.

Additional letters, presentations and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents.

OTH-11.1 D Packaging and Labeling Subcommittee

Source:
NCWM Packaging and Labeling Subcommittee (PALS)

Purpose:
Provide an update of the activities of this Subcommittee which reports to the L&R Committee. The mission of PALS is to assist the L&R Committee in the development of agenda item, NCWM positions and new standards related to packaging and labeling. The Subcommittee will also be called upon to provide important and much needed guidance to the regulatory and consumer packaging communities on difficult questions.

PALS will report to NCWM L&R Committee. The Subcommittee is comprised of a Chair, eight voting members, and anyone interested in packaging and labeling standards.

Original Justification:
This item is to provide a report on the activities of the Packaging and Labeling Subcommittee which reports and provides recommendations to the Laws and Regulations Committee.

For more information or to provide comments, please contact the PALS Chair:

Mr. Chris Guay
CGGT
513-652-6597, guay.cb@gmail.com

Item Development:
NCWM 2025 Annual: Chairman Chris Guay provided the following report to the Committee:

The Packaging and Labeling Subcommittee (PALS) met Sunday July 13th at the NCWM Annual Meeting in Reno to provide the 30 persons in attendance with an update and overview of PALS's Best Practice /Guidance Document pertaining to Quantity-Related Expressions which to share in detail the PALS presentation on Voluntarily Added Expressions of Quantity which Appear on the Principal Display Panel of a package. Chair Guay provided the 30 participants in attendance with a background overview and then went through in detail a presentation planned for the L&R Open Hearing on Monday the 14th.

This document when completed is expected to be approved and released as a NCWM guidance document and will not be voted upon by the membership. Now that the document is nearing completion, PALS wants to make sure as many NCWM members as possible have seen it and have the opportunity to provide comment.

Comments received at the PALS meeting were very positive. Both major retailers and W&M Directors expressed strong support and told PALS they would like for this to be adopted as soon as possible.

There were no added comments during the Open Hearing,

The addition to the report, Chairman Chris Guay updated the Committee on PALS activities during the Open Hearings.. He informed the Committee that PALS has been working on a resource document to assist industry with acceptable "supplemental" quantity labeling used to complement the required quantity statements on packages.

Mr. Guay gave a presentation on the resource document. He indicated that the document will not be a regulation. It is intended to assist Industry in understanding what is and what is not acceptable supplementary quantity labeling. In the presentation he showed examples of what is acceptable and what is not acceptable.

The resource document once completed will be given to the NCWM Board of Directors for review and approval as a training document.

Mr. Guay encouraged anyone interested in working with PALS on the document to contact him.

NCWM 2025 Interim: Chairman Chris Guay updated the Committee on PALS activities and provided the following written report.

The Packaging and Labeling Subcommittee met on Sunday, January 12th as part of the 2025 NCWM Interim Meeting.

PALS presented an update of a draft NCWM Guidance document which, when finalized and approved, would provide detailed directions to manufacturers, packagers and regulatory officials regarding added information appearing on the Principal Display Panel (PDP). The Packaging and Labeling Subcommittee received input from approximately 20-25 members.

Several in attendance expressed interest in assisting PALS with this document. The primary areas requiring development are 2 appendices, one which provides illustrations of principals and one which details the history of supplemental information in Federal law, regulation, and interpretation.

PALS will continue conducting monthly web meetings through July and update the L&R Committee at the NCWM Annual Meeting in July.

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

The committee heard no update from PALS.
The WWMA L&R Committee thanks the Packaging and Labeling Subcommittee for its work and recommends this item remain developing.

CWMA 2025 Interim Meeting:

No comments.

The CWM L&R Committee recommends a developing status for this item.

NEWMA 2025 Interim Meeting:

No comments were heard on this item. As this is a standing subcommittee report, the committee recommended a Developing status, and the body concurred.

SWMA 2025 Annual Meeting:

No comments were received during open hearing on this item.

The Committee recommends this item remain Developing.

Additional letters, presentations and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents.

NET – HANDBOOK 133

NET-26.1 Table 2-3. Moisture Allowances

Source:
New Jersey Food Council

Purpose:
The New Jersey Food Council, through its counsel, respectfully submit this proposal to amend the National Institute of Standards and Technology ("NIST") Handbook 133 at Chapter 2, Section 2.3.8.1. It is being requested that this section be amended to provide a moisture allowance for produce at 6 percent, which reflects the high water volume of fruits and vegetables and the corresponding moisture loss upon harvesting. This proposal is made in conjunction with a separately submitted proposal to amend Handbook 130.

Item under Consideration:
Amend NIST Handbook 133 as follows:

Table 2-3.
Moisture Allowances

Verifying the labeled net weight of packages of:	Moisture Allowance is:	Notes
Flour	3 %	
Dry pet food	3 %	Dry pet food means all extruded dog and cat foods and baked treats packaged in Kraft paper bags and/or cardboard boxes with a moisture content of 13 % or less at time of pack.
Pasta products	3 %	Pasta products means all macaroni, noodle, and like products packaged in kraft paper bags, paperboard cartons, and/or flexible plastic bags with a moisture content of 13 % or less at the time of pack.
Borax	see Section 2.4. Borax	
Cannabis	3 %	*Cannabis* means plant material only, and not products containing *Cannabis*, whether containing more than 0.3 % Total Delta-9 THC (also known as cannabis, Marijuana, or

		Marihuana) or containing 0.3 % or less Total Delta-9 THC (also known as Hemp).
Fruits	**6 %**	**Fruits mean the mature or ripened reproductive structures (ovary of a flower) formed by plants that enclose seeds and help with their dispersal. Fruits shall include: a) "small fruits" which includes, but is not limited to, cherries, currants, and cherry tomatoes; and b) "berries," which includes all fruit whose names end in the term "berry", except when offered for sale and sold by the box, basket or other standard dry-measure receptacle.**
Vegetables	**6 %**	**Vegetables means any part of a plant including: (a) edible underground parts, such as roots, tubers, and bulbs; (b) edible above ground parts, such as stems, leaves, and flowers; and (c) edible fruits and seeds, such as usually unripe fruits and seeds.**

Previous Status:
New Proposal

Original Justification:
The revisions to Handbook 133 being presented for consideration reflect modern supply chains and sales practices as it concerns fresh produce. While several products such as meat, poultry, flour, pasta and even cannabis are provided a "moisture allowance," produce is not. Yet fruits and vegetables are generally more than 80 percent water. Moisture loss is a scientifically recognized, inevitable process during storage and distribution of produce due to its perishable and hydrophilic nature. Failing to account for this natural variability imposes an unfair compliance burden on industry and does not reflect the true intent of fair packaging and labeling practices.

The submitter acknowledges that some may argue that the moisture loss requested is too high as compared to other products.

The submitter requested Voting status in 2026.

Comments in Favor:

Regulatory:
•

Industry:
•

Advisory:
•

Comments Against:

Regulatory:
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Industry:
•

Advisory:
•

Neutral Comments:

Regulatory:
•

Industry:
•

Advisory:
•

Item Development:
New Proposal

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

Mr. Austin Shepherd (County of San Diego, California) spoke to discussions which occurred at the NCWM Annual Meeting regarding moisture loss and that the percentages in the table were based upon supporting data which was provided by industry. Because the submitter provided no data for this proposal, he recommended a developing status or that the item be withdrawn.

Mr. Jose Arriaga (County of Orange, California) stated that the descriptions in the proposal are broad and agreed with Mr. Shepherd. He clarified that using the botanical descriptions might not be appropriate and suggested that the submitter works with USDA to classify products.

Ms. Wendy Hahn (County of Stanislaus, California) stated that fruits and vegetables are much more perishable than other products and that the range in moisture loss for given fruits or vegetables may be broad.

Mr. Aaron Yanker (Colorado Department of Agriculture, Weights and Measures) stated that he did not recognize the intent or see the merit in the item and recommended that the item be withdrawn. He also recognized that there is a Moisture Allowance Task Group addressing moisture loss for all items.

Mr. Matt Douglas (California Division of Measurement Standards) recognized that there are already items on the agenda and a work group assessing the applicability of moisture loss. He recommended that this item be withdrawn pending the results of the workgroup. He stated that if the item stays on the agenda the submitter should work with NIST and/or the workgroup to identify how to develop the item including providing data, or that the item should be assigned to the moisture allowance task group to evaluate whether the item is necessary, and whether the proposed percentages and descriptions are appropriate.

Mr. Kurt Floren (County of Los Angeles, California) spoke to concerns about the item as presented including the percentage of moisture loss identified, the lack of data, and the broadness of the categories to which this moisture loss would apply. However, he expressed support for the idea in principle and encouraged the council to engage with industry, noting that it was unusual for industry to reach out and ask for this. He suggested the creation of a task group to work with industry to seek additional data and develop these moisture loss "allowances".

The WWMA L&R Committee recommends that this item be assigned to a new task group.

CWMA 2025 Interim Meeting:

Several regulators and a retired individual were opposed to this item and recommended withdrawal. A NIST representative had no official position but would likely not support the item.

No data was included to support this item.

The CWMA L&R Committee Recommends a withdrawn status for this item.

NEWMA 2025 Interim Meeting:

A representative from Gibbons, P.C., on behalf of the New Jersey Food Council (NJFC), gave a presentation regarding the letter they submitted as a supporting document that appears on the NEWMA website. They commented that sales practices for produce have changed over the years and most produce products are shipped in from other state or countries. He also commented that produce has high moisture content and gave the following examples: romaine lettuce 95%, blueberries and strawberries 90%, and blueberries have up to 14% moisture loss. The request for 6% is because of the nature of the products being so complex and full of water, they felt that doubling the 3% consideration for other listed products was appropriate. A regulator from New York commented that in the justification of the item, "fresh produce" is mentioned, however, in the table "fresh" does not appear, meaning this would apply to all produce; canned, dried, cooked, etc. The regulator also commented that moisture loss is not a require allowance, but a consideration. He also indicated that if this item moves forward, it could be group within Block 4. A regulator from Westchester County, NY commented that he has concerns that this item, as written, would also apply to cut produce that is prepared instore or elsewhere. The representative on behalf of the NJFC indicated that this item was intended for fresh whole produce only. A regulator from Connecticut commented that misters could be used to solve the moisture issue at retail, and the representative on behalf of the NJFC indicated that misters present slip and fall liability so they have largely been discontinued. A regulator from New Jersey commented that the taxonomic definitions of vegetables and fruits left out fungi, such as mushrooms, which is a form of produce. He also commented that the submitter has not provided any data regarding moisture loss for any specific product and a blanket 6% is not appropriate. He also commented that while the Supreme Court ruled that we must consider variation in product weight, those considerations are already in place with Maximum Allowable Variations. To consider additional variations, data would need to be provided on a case-by-case basis. New Jersey recommended this item be withdrawn. A regulator from Vermont commented that he has performed a lot of package weighing over the years and 6% without a study is arbitrary and recommends a withdrawn status. The representative on behalf of the NJFC pointed to the studies that were referenced in the supporting document letter. A regulator from Westchester County, NY commented that if a comparison was to be made from produce to a commodity in the Table, it would be cannabis. The representative on behalf of the NJFC indicated that cannabis is still a federally illegal substance and should not be compared to produce. A regulator from New York echoed the comments made by New Jersey and Vermont and recommended a withdrawn status.

After hearing comments from the floor and reviewing the supporting documents, the committee recommended a Withdrawn status, and the body concurred.

SWMA 2025 Annual Meeting:

Mr. Tory Brewer with the State of West Virgina questions where the proposer gets the 6% value from. There is no supporting data for this value and recommends a Withdraw status.

The Committee heard comments from Dr. Matthew Curran, Florida – He recommend not forwarding this to the NCWM as we do not believe it has merit. Fruits and vegetables have a wide range of moisture contents, some moist and some dry, so a blanket 6% allowance sets the table for inequitable sales and fraud in the worst. Further, no scientific data has been presented to justify any specific moisture allowance.
Several other state representatives echoed the state of West Virgina and Florida and recommended a Withdraw status.

Based on the comments received from the floor the Committee recommends a Withdraw status.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents.

ITEM BLOCK 4 (B4) MOISTURE ALLOWANCE CONSIDERATION

Source:
Michigan Department of Agriculture & Rural Development

Purpose:
Change the language for the moisture gray area from "moisture allowance" to "moisture consideration."

Previous Status:
2025: New Proposal

Original Justification:
This is a companion item to those changes requested for HB133.

In speaking with both weights and measures officials and industry, quite often both interpret the language "moisture allowance" to mean "tolerance" which should automatically be given to inspection results when a lot is found short. Changing the wording to "moisture consideration" should be more clear that "Further information is required to determine lot compliance or noncompliance", as stated in the glossary.

Some industries may believe "moisture allowance" should be used as a tolerance and have always used it as same. There may also be enforcement jurisdictions that want to continue to use it as a tolerance rather than conducting additional investigations into the root cause of shortages found in those packages that allow moisture consideration.

Previous Status:
2025: New Proposal

B4: POL-25.1 A 2.6.12. Point-of-Pack Inspection Guidelines.

Item under Consideration:
Amend Handbook 130 NCWM Policy, Interpretations, and Guidelines as follows:

2.6.12. Point-of-Pack Inspection Guidelines.

A. Weights and Measures Officials' Responsibilities.

...

vi. Apply moisture allowances ~~s~~ **considerations**, if applicable.

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

The WWMA L&R Committee heard comments on this item as part of Block 4 rather than as an individual item, so these comments apply to the whole block.

Mr. Kurt Floren (County of Los Angeles, California) stated that he was a member of the Moisture Allowance Task Group. This proposal is being considered because federal laws require regulators to consider moisture loss when applying tolerances. Variations in net weight occur due to fluctuations in moisture even with good distribution practices. The language the task group will be developing will be based upon the language in Federal law which speaks to "reasonable variation".
Mr. Aaron Yanker (Colorado Department of Agriculture, Weights and Measures), Mr. Austin Shepherd (County of San Diego, California), and Mr. Matt Douglas (California Division of Measurement Standards) expressed support for the task group and the comments made by Mr. Floren.

The WWMA L&R Committee recommends this item remain assigned.

CWMA 2025 Interim Meeting:

One regulator recommended withdrawal while another regulator recommend assigned status. Concerns were raised regarding the definitions of "Allowances Considerations".

The CWMA L&R Committee recommends this item remains assigned.

NEWMA 2025 Interim Meeting:

Comments were heard together on all items in Block 4. All comments heard apply to each item in this Block 4.

A regulator from New York (and member of the Moisture Task Group) gave an update. He commented that the task group met on October 7, 2025 and will be meeting monthly. They are looking to align the language with federal language. A regulator from New Jersey commented they are looking forward to the work of the task group and recommended an Assigned status.

After hearing comments from the floor, the committee recommended an Assigned status, and the body concurred.

SWMA 2025 Annual Meeting:

Mr. Tory Brewer, moisture allowance task group chair, commented that the moisture allowance task group has met only once and has decided to rewrite the entire moisture allowance section. The group will meet again in November and plans on having a tentative draft that will be presented in January at the NCWM 2026 interim.

The Committee recommends this item remain Assigned. This applies to all items in Block 4.

B4: NET-25.1 A 1.2.6.1. Applying a Moisture Allowance Consideration, 2.3.8. Moisture Allowances Considerations, 4.10.2.2. Moisture Shrinkage Allowance Consideration for Structural Plywood and Wood-based Structural Panels, 4.11.2.1. Shrinking Allowance Consideration

Source:
Michigan Department of Agriculture & Rural Development

Purpose:
Change the language for the moisture gray area from "moisture allowance" to "moisture consideration."

Item under Consideration:
Amend Handbook 133 Checking the Net Contents of Packaged Goods as follows:

1.2.6.1. Applying a Moisture Allowance

Test procedures for flour, some meat, and poultry are based on the concept of a "moisture allowance consideration" also known as a "gray area" or "no decision" area (see Section 2.3.8. "Moisture Allowances Considerations"). When the average net weight of a sample is found to be less than the labeled weight, but not more than the boundary of the "gray area," the lot is said to be in the "gray" or "no decision" area. The gray area is not a tolerance. More information must be collected before lot compliance or noncompliance can be decided. Appropriate enforcement should be taken on packages found short weight and outside of the "moisture allowance consideration" or "gray area."

Some packaged products may lose or gain moisture and, therefore, lose or gain weight or volume after packaging. The amount of moisture loss depends upon the nature of the product, the packaging material, the length of time it is in

distribution, environmental conditions, and other factors. Moisture loss may occur even when manufacturers follow good distribution practices. Loss of weight "due to exposure" may include solvent evaporation, not just loss of water. For loss or gain of moisture, the moisture allowance~~s~~ **considerations** may be applied before or after the package errors are determined.

To apply a~~n~~ allowance **consideration** before determining package errors, adjust the Nominal Gross Weight (see Section 2.3.6. "Determine Nominal Gross Weight and Package Errors"), so the package errors are increased by an amount equal to the moisture allowance **consideration**. This approach is used to account for moisture loss in both the average and individual package errors.

It is also permissible to apply the moisture allowance~~s~~ **considerations** after individual package errors and average errors are determined.

Example:

*A sample of a product that could be subject to moisture loss might fail because the average error is minus or the error in several of the sample packages are found to be unreasonable errors (i.e., the package error is greater than the Maximum Allowable Variation **Consideration** (MAV) permitted for the package's labeled quantity).*

A sample of a product that could be subject to moisture loss might fail because the average error is minus or the error in several of the sample packages are found to be unreasonable errors (i.e., the package error is greater than the Maximum Allowable Variation (MAV) permitted for the package's labeled quantity).

You may apply a moisture allowance **consideration** after determining the package errors by adding the allowance to the Sample Error Limit (SEL) and then comparing the average error to the SEL to determine compliance. The moisture allowance must be added to the MAV before evaluating sample errors to identify unreasonable minus errors.

~~(Amended 2010)~~

This handbook provides "moisture allowance~~s~~ **considerations**" for some meat and poultry products, flour, pasta, *Cannabis* (this only includes plant material but does not include products containing *Cannabis*) and dry pet food. (see Chapter 2, Table 2-3. "Moisture Allowance~~s~~ **considerations**") These allowances are based on the premise that when the average net weight of a sample is found to be less than the labeled weight, but not by an amount that exceeds the allowable limit, either the lot is declared to be within the moisture allowance consideration or more information must be collected before deciding lot compliance or noncompliance.

~~(Amended 2024)~~

~~Test procedures for flour, some meat, and poultry are based on the concept of a "moisture allowance" also known as a "gray area" or "no decision" area (see Section 2.3.8. "Moisture Allowances"). When the average net weight of a sample is found to be less than the labeled weight, but not more than the boundary of the "gray area," the lot is said to be in the "gray" or "no decision" area. The gray area is not a tolerance. More information must be collected before lot compliance or noncompliance can be decided. Appropriate enforcement should be taken on packages found short weight and outside of the "moisture allowance" or "gray area."~~

(Amended 2010. 2024 **and 20XX**)

2.3.7 Evaluate for Compliance

This inspection lot will pass or fail based on the sample test results. The following steps lead the inspector through the process to determine if a sample passes or fails. If the product is subject to a moisture allowance consideration,

follow the procedures under Section 2.3.8. "Moisture Allowances" to correct the MAV.**2.3.7.1. Maximum Allowable Variation (MAV) Requirement**

Compare each minus package error with the MAV recorded in Box 3 or Box 4 (if using dimensionless units). Circle the package errors that exceed the MAV. These are "Unreasonable Minus Errors." Record the number of unreasonable minus errors found in the sample in Box 16.

Compare the number in Box 16 with the number of unreasonable errors allowed (recorded in Box 8). If the number found exceeds the allowed number, the lot fails. Record in Box 17 whether the number of unreasonable errors found is less or more than allowed.

Note: If a total quantity declaration on a multiunit or variety package is being verified, and the MAV applied is not based on a percent of the labeled quantity (see Section 1.2.4.1. "Total Quantity MAV for Multiunit and Variety Packages).

(Note Added 2022)

2.3.7.2. Average Requirement

…

4. Compliance Evaluation of the Average Error:

…

- If the value of the Average Error (disregarding the sign) (Box 18) is larger than the Sample Error Limit (Box 23), the sample fails. However, if the product is subject to moisture loss, the sample does not necessarily fail. Follow the procedures under "Moisture Allowance~~s~~ **Considerations**" in this chapter.

(Amended 2018, 2022 and 20XX)

2.3.8. Moisture Allowances

When no predetermined allowance is found in NIST Handbook 133, the potential for moisture loss must be considered. Inspectors should follow their jurisdiction's guidance for making their determination on an acceptable moisture allowance **consideration**.

(Added 2010) **(Amended 20XX)**

If the product tested is subject to moisture loss, provide for the moisture allowance by following one of the two procedures listed below.

2.3.8.1 Applying Moisture Loss before Determining Package Errors

Determine the percent value of the moisture allowance if the product is listed below. (see Table 2-3. "Moisture Allowance~~s~~ **Considerations**.")

Table 2-3. Moisture Allowances Considerations		
Verifying the labeled net weight of packages of:	**Moisture Allowance Consideration is:**	**Notes**
Flour	3 %	
Dry pet food	3 %	Dry pet food means all extruded dog and cat foods and baked treats packaged in Kraft paper bags and/or cardboard boxes with a moisture content of 13 % or less at time of pack.
Pasta products	3 %	Pasta products means all macaroni, noodle, and like products packaged in kraft paper bags, paperboard cartons, and/or flexible plastic bags with a moisture content of 13 % or less at the time of pack.
Borax	see Section 2.4. Borax	
Cannabis	3 %	*Cannabis* means plant material only, and not products containing *Cannabis*, whether containing more than 0.3 % Total Delta-9 THC (also known as cannabis, Marijuana, or Marihuana) or containing 0.3 % or less Total Delta-9 THC (also known as Hemp).
Wet Tare Only[1]		
Fresh poultry	3 %	Fresh poultry is defined as poultry above a temperature of − 3 °C (26 °F) that yields or gives when pushed with the thumb.
Franks or hot dogs	2.5 %	
Bacon, fresh sausage, and luncheon meats	0 %	For packages of bacon, fresh sausage, and luncheon meats, there is no moisture allowance **consideration** if there is no free-flowing liquid or absorbent material in contact with the product and the package is cleaned of clinging material. Luncheon meats are any cooked sausage product, loaves, jellied products, cured products, and any sliced sandwich-style meat. This does not include whole hams, briskets, roasts, turkeys, or chickens requiring further preparation to be made into ready-to-eat sliced product. When there is no free-flowing liquid inside the package and there are no absorbent materials in contact with the product, Wet Tare and Used Dried Tare are equivalent.
[1] Wet tare procedures must not be used to verify the labeled net weight of packages of meat and poultry packed at an official United States Department of Agriculture (USDA) facility and bearing a USDA seal of inspection. The Food Safety and Inspection Service (FSIS) adopted specific sections of the 2005 4th edition of NIST Handbook 133 by reference in 2008 but not the "Wet Tare" method for determining net weight compliance. FSIS considers the free-flowing liquids in packages of meat and poultry products, including single-ingredient, raw poultry products, to be integral components of these products (see Federal Register, September 9, 2008 [Volume 73, Number 175] [Final Rule – pages 52189-52193]).		
Notes:		

Table 2-3. **Moisture Allowances ~~-~~ Considerations**
(1) There is no moisture allowance **consideration** when inspecting meat and poultry from a USDA inspected plant when Used Dry Tare and "Category A" sampling plans are used.
(2) For the Wet Tare Only section of Table 2-3. "Moisture Allowances ~~-~~ **Considerations**," free-flowing liquid and liquid absorbed by packaging materials in contact with the product are part of the wet tare. (Note Added 2010)

(Amended 2010, 2013, ~~and~~ 2024 **and 20XX**)

To compute moisture allowance **consideration**, multiply the labeled quantity by the decimal percent value of the allowance. Record this value in Box 13a.

Example:
Labeled net quantity of flour is 907 g (2 lb)
*Moisture Allowance **Consideration** is 3 % (0.03)*
*Moisture Allowance **Consideration** = 907 g (2 lb) × 0.03 = 27 g (0.06 lb)*

If the Moisture Allowance **Consideration** is known in advance (e.g., flour, pasta products, and dry pet food), it can be applied by adjusting the Nominal Gross Weight used to determine the sample package errors. The Moisture Allowance **Consideration** in Box 13a is subtracted from the Nominal Gross Weight to obtain an Adjusted Nominal Gross Weight which is entered in Box 14. The Nominal Gross Weight is defined in Section 2.3.6.1. as the sum of the Labeled Weight and the Average Tare Weight from Box 13.

Example:
Use a Labeled Weight of 907 g (2 lb) and an Average Tare Weight of 14 g (0.03 lb)

The calculation is:

*Labeled Net Quantity 907 g (2 lb) + Average Tare Weight 14 g (0.03 lb) = 921 g (2.03 lb) – Moisture Allowance **Consideration** 27 g (0.06 lb) = Adjusted Nominal Gross Weight of 894 g (1.97 lb)*

This result is entered in Box 14.

Determine package errors by subtracting the Adjusted Nominal Gross Weight from the Gross Weights of the Sample Packages.

Example:
The calculation is:

Gross Weight of the Sample Packages – Adjusted Nominal Gross Weight = Package Error

Note: When the Nominal Gross Weight is adjusted by subtracting the Moisture Allowance **Consideration** value(s) the Maximum Allowable Variation(s) is not changed. This is because the errors that will be found in the sample packages have been adjusted by subtracting the Moisture Allowance **Consideration** (e.g., 3 %) from the Nominal Gross Weight. That increases the individual package errors by the amount of the moisture allowance **consideration** (e.g., 3 %). If the value(s) of the MAV(s) were also adjusted it would result in doubling the allowance **consideration**. MAV is always based on the labeled net quantity.

(Added 2010) **(Amended 20XX)**

2.3.8.2. Applying Moisture Allowance after Determining Package Errors

Adjustments can be made when the value of the Moisture Allowance **Consideration** is determined following the test (e.g., after the sample fails or if a packer provides reasonable moisture allowance **consideration** based on data obtained using a scientific method) using the following approach:

If the sample fails the Average Requirement but has no unreasonable package errors, only Step 1 is used. If the sample passes the Average Requirement but fails because the sample included one or more Unreasonable Minus Errors, only Step 2 is used.

If the sample fails the Average and MAV Requirements, both of the following steps are applied.

1. Use the following approach to apply a Moisture Allowance **Consideration** to the Average Requirement after the test is completed:

   the Moisture Allowance **Consideration** is computed;

2. To apply Moisture Allowance **Consideration** to the MAV(s) after the test, the following method is recommended:

   compute Moisture Allowance **Consideration**;

…

(Added 2010) **(Amended 20XX)**

Moisture Allowance Consideration Gray Area

When the average error of a lot of fresh poultry, franks/hot dogs, or pasta products is minus but does not exceed the established "moisture allowance **consideration**" or "gray area," contact the packer or plant management personnel to determine what information is available on the lot in question. Questions to the plant management representative may include:

This handbook provides "moisture allowances ~~s~~ **considerations**" for some meat and poultry products, flour, pasta products, and dry pet food. These allowances are based on the premise that when the average net weight of a sample is found to be less than the labeled weight, but not by an amount that exceeds the allowable limit, either the lot is declared to be within the moisture allowance **consideration** or further investigation can be conducted.

Previous Status:

2025: Downgraded from Voting to Assigned with a request for a task group.

Original Justification:
This is a companion item to those changes requested for HB130.

In speaking with both weights and measures officials and industry, quite often both interpret the language "moisture allowance" to mean "tolerance" which should automatically be given to inspection results when a lot is found short. Changing the wording to "moisture consideration" should be more clear that "Further information is required to determine lot compliance or noncompliance", as stated in the glossary.

Possible Opposing Arguments:

Some industries may believe "moisture allowance" should be used as a tolerance and have always used it as same. There may also be enforcement jurisdictions that want to continue to use it as a tolerance rather than conduct ing additional investigations into the root cause of shortages found in those packages that allow moisture consideration.

Comments in Favor:

Regulatory:

- 2025 Annual: Mr. Steve Harrington OR said that during Western regional meeting he opposed the item but now supports it.

- 2025 Interim: Mr. Craig VanBuren, Michigan, informed the Committee that the latest version of the item includes a change to the title and removed reference to lumber. He said the changes do not change the intent of the original proposal.

- 2025 Interim: Mr. Steve Timar, State of New York, supports the latest changes and recommends voting status.

Industry:

- None

Advisory:

- None

Comments Against:

Regulatory:

- 2025 Annual: Mr. Jason Flint New Jersey expressed concerns on this item. He stated he had discussions with retailers and attorneys on short weights in produce and bar soap. Industries not listed in the table believe it must be considered. Mr. Flint recommended that it be downgraded to Assigned status.
- 2025 Annual: Ms. Kristin Walter Arkansas suggested the item be withdrawn and emphasize that the body should come together on what we apply moisture allowance to.
- 2025 Annual: Mr. Doug Rathbun Illinois opposed the item.
- 2025 Annual: Mr. Matt Douglas California supported the NIST comments to de-escalate to assigned status. He said that changes from the interim may create confusion and was concerned that the item has not been vetted enough. He questioned the use of the word “consideration” after “maximum allowance variation”.
- 2025 Annual: Mr. Kurt Floren County of Los Angeles stated that this is an error to add consideration after maximum allowable variation per Matts comment, this needs to be removed.
- 2025 Annual: Mr. Mike Smith New York concurred with Matt Douglas, California and recommended the item be downgraded from voting status to assigned status.
- 2025 Annual: Mr. Mike Brooks Arizona agreed to make it assigned. He went on to say that there is lots of history and discussion on this problem and we should get it right, not fast.

- 2025 Annual: Ms. Alison Wilkinson Maryland recommended assigning the item to a work group. She believes this will help regulators find short weights when industry just wants to use the excuse of moisture allowance
- 2025 Interim: None

Industry:

- 2025 Interim: Mr. David Kretschmann, American Lumber Standard opposed the inclusion of lumber in the item but withdrew opposition after being informed that lumber had been removed from the item.

Advisory:

- None

Neutral Comments:

Regulatory:

- 2025 Annual: Mr. Kurt Floren county of LA – federal law forces us to take into account reasonable variations, we have to "consider" reasonable variations, HB133 has words grey area, we have used different terminology, Handbook says grey area is not a tolerance, he argues to change it back to grey area in all places to be more clear, still support the item but will push the grey area as defined if we go back and rework it.

  Mr. Floren also shared that he thinks the regional comments have been resolved. He agrees with the lumber industry. He believes the term should be changed to "Grey Area" because he believes that term is clearer. He agrees with the committee moving the "grey area" statement to the top.

- 2025 Annual: Mr. Craig VanBuren MI, the submitter of the item, said he is fine with downgrading the item as long as we get to a place easily digestible by industry.

  Mr. VanBuren Michigan and the submitter also informed the Committee that the title needs to reflect the removal of plywood from the item - 4.10.2.2. Moisture Shrinkage Allowance Consideration for Structural Plywood and Wood-based Structural Panels, 4.11.2.1. Shrinking Allowance-Consideration

Industry:

- None

Advisory:

- 2025 Annual: Mr. John McGuire NIST OWM pointed to the NIST OWM analysis and recommended that the item be de-escalated to assigned status.

- 2025 Annual: Mr. David Sefcik NIST OWM questioned if changing terminology will change anything. He said the Supreme Court has ruled that you have to allow for reasonable variations, that it cannot be arbitrary and must be based on data. He indicated that more work needs to be done on this item.

- 2025 Annual: Mr. Kurt Floren County of Los Angeles agreed with Mr. Sefcik and said, let's do it right with enough true guidance to help regulators draw the right line.

- 2025 Interim: None

Item Development:

NCWM 2025 Annual: The Committee heard concerns about this item from membership. Membership indicated the need to pull it back and assign it to a task group. Based on the feedback received, the Committee downgraded it from Voting to Assigned. The Committee will request a moisture allowance task group be formed to better develop the item.

The Committee concurs with Mr. VanBuren's comment that the title needs to reflect the removal of plywood from the item - 4.10.2.2. Moisture Shrinkage Allowance Consideration for Structural Plywood and Wood-based Structural Panels, 4.11.2.1. Shrinking Allowance-Consideration.

The Committee will relay this information to the task group for their consideration.

NCWM 2025 Interim: The Committee received several versions of this item. The version appearing here is the latest and the one under consideration. It does not include Chapter 4, the Table of Contents, examples, reports and other sections previously included that did not require changes.

The Committee reserves the right to make editorial changes to fulfill the intent of the proposal (to add "consideration" to wherever "Moisture Allowance" appears in NIST Handbooks 130 and 133.) The Committee believes that the item is fully developed an assigned Voting status.

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

The WWMA L&R Committee heard comments on this item as part of Block 4 rather than as an individual item, so these comments apply to the whole block.

Mr. Kurt Floren (County of Los Angeles, California) stated that he was a member of the Moisture Allowance Task Group. This proposal is being considered because federal laws require regulators to consider moisture loss when applying tolerances. Variations occur due to fluctuations in moisture even with good distribution practices. The language the task group will be developing will be based upon the language in Federal law which speaks to "reasonable variation".

Mr. Aaron Yanker (Colorado Department of Agriculture, Weights and Measures), Mr. Austin Shepherd (County of San Diego, California), and Mr. Matt Douglas (California Division of Measurement Standards) expressed support for the task group and the comments made by Mr. Floren.

The WWMA L&R Committee recommends this item remain assigned.

CWMA 2025 Interim Meeting:

One regulator recommended withdrawal while another regulator recommend assigned status. Concerns were raised regarding the definitions of "Allowances Considerations".

The CWMA L&R Committee recommends this item remain assigned.

NEWMA 2025 Interim Meeting:

Comments were heard together on all items in Block 4. All comments heard apply to each item in this Block 4.

A regulator from New York (and member of the Moisture Task Group) gave an update. He commented that the task group met on October 7, 2025 and will be meeting monthly. They are looking to align the language with federal language. A regulator from New Jersey commented they are looking forward to the work of the task group and recommended an Assigned status.

After hearing comments from the floor, the committee recommended an Assigned status, and the body concurred.

SWMA 2025 Annual Meeting:

Mr. Tory Brewer, moisture allowance task group chair, commented that the moisture allowance task group has met only once and has decided to rewrite the entire moisture allowance section. The group will meet again in November and plans on having a tentative draft that will be presented in January at the NCWM 2026 interim.

The Committee recommends this item remain Assigned. This applies to all items in Block 4.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents.

Mauricio Mejia, Florida | Chair
Michael Peeler, New Jersey | Vice-Chair
Mike Harrington, Iowa | Member
Austin Shepherd, San Diego County | Member
Jose Arriaga, Orange County, California | Member
Brent Price, Gilbarco | AMC Representative
Rowan Hemsing, Measurement Canada | Canadian Technical Advisor
John McGuire, NIST OWM | NIST Technical Advisor
Loren Minnich, NIST OWM | NIST Technical Advisor
Constantine Cotsoradis, NCWM | Committee Coordinator

Laws and Regulations Committee

Specifications and Tolerances (S&T) Committee
2026 Interim Meeting Agenda

Mark Lovisa, Committee Chair
Louisiana

INTRODUCTION

The S&T Committee will address the following items in Table A during the Interim Meeting. Table A identifies the agenda items by reference key, title of item, page number and the appendices by appendix designations. The headings and subjects apply to *Handbook 44 Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices, 2026 Edition*. The first three letters of an item's reference key are assigned from the Subject Series List. The next 2 digits represent the year the item was introduced. The acronyms for organizations and technical terms used throughout the agenda are identified in Table B. In some cases, background information will be provided for an item. The fact that an item appears on the agenda does not mean it will be presented to the National Council on Weights and Measures (NCWM) for a vote. The Committee will review its agenda and may withdraw some items, present some items for information meant for additional study, issue interpretations, or make specific recommendations for change to the publications identified, which will be presented for a vote at the Annual Meeting. The Committee may also take up routine or miscellaneous items brought to its attention after the preparation of this document. The Committee may decide to accept items for discussion that are not listed in this document, providing they meet the criteria for exceptions as presented in *NCWM Policy 3.1.4. Handbooks, Procedures to Modify Handbooks*. The Committee has not determined whether the items presented will be Voting or Informational in nature; these determinations will result from their deliberations at the Interim Meeting.

Items may be grouped into "Blocks" if they are:

- **Opposing Items:** Items in direct conflict with each other, and only one may be adopted,
- **Interdependent Items:** Items addressing a similar topic where, if one is adopted, all need to be adopted, and
- **Related Items:** Items addressing a similar topic across multiple codes or regulations.

An "Item Under Consideration" is a statement of proposal and not necessarily a recommendation of the Committee. Suggested revisions are shown in **bold face print** by ~~**striking out**~~ information to be deleted and **underlining** information to be added. Requirements that are proposed to be nonretroactive are printed in ***bold faced italics***. Additional letters, presentations and data may have been part of the committee's consideration. Please refer to www.ncwm.com/publication-15 to review these documents.

In some cases, there may be proposed changes affecting multiple model laws or regulations that share the same purpose or proposed changes to one model law or regulation may be dependent on the adoption of proposed changes to another. The Committee may group such items into "Blocks" to facilitate efficient handling for open hearings and voting. These blocks are identified in Committee's agenda.

All sessions are open to registered attendees of the meeting. If the Committee must discuss any issue that involves proprietary information or other confidential material; that portion of the session dealing with the special issue may be closed if (1) the Chairman or, in their absence, the Chairman-Elect approves; (2) the Executive Director is notified; and (3) an announcement of the closed meeting is posted on or near the door to the meeting session and at the registration table. If possible, the posting will be done at least a day prior to the planned closed session.

Note: It is policy to use metric units of measurement in publications; however, recommendations received by NCWM technical committees and regional weights and measures associations have been printed in this publication as submitted. Therefore, the report may contain references to inch-pound units.

Subject Series List

Table A
Table of Contents

Table B
Glossary of Acronyms and Terms

Acronym	Term	Acronym	Term
ABWS	Automatic Bulk Weighing System	NEWMA	Northeastern Weights and Measures Association
AAR	Association of American Railroads	NIST	National Institute of Standards and Technology
API	American Petroleum Institute	NUEMS	Non-Utility Electricity-Measuring System
CNG	Compressed Natural Gas	NTEP	National Type Evaluation Program
CWMA	Central Weights and Measures Association	OIML	International Organization of Legal Metrology
EPO	Examination Procedure Outline	OWM	Office of Weights and Measures
EVSE	Electric Vehicle Supply Equipment	RMFD	Retail Motor Fuel Dispenser
FHWA	Federal Highway Administration	S&T	Specifications and Tolerances
GMM	Grain Moisture Meter	SD	Secure Digital
GPS	Global Positioning System	SI	International System of Units
HB	Handbook	SMA	Scale Manufactures Association
LMD	Liquid Measuring Devices	SWMA	Southern Weights and Measures Association
LNG	Liquefied Natural Gas	TC	Technical Committee
LPG	Liquefied Petroleum Gas	USNWG	U.S. National Work Group
MMA	Meter Manufacturers Association	VTM	Vehicle Tank Meter
MDMD	Multiple Dimension Measuring Device	WIM	Weigh-in-Motion
NCWM	National Council on Weights and Measures	WWMA	Western Weights and Measures Association

Details of All Items
(In order by Reference Key)

GEN – GENERAL CODE

GEN-25.1 W G-S.5.6. Recorded Representations

Source:
Tesla, NEMA, ABB, Electrify America, RaceTrac, Colorado Division of Oil and Public Safety, Michigan Department of Agriculture & Rural Development

Purpose:
Update Handbook 44 Section G-S.5.6 Recorded Representations, to explicitly include QR codes as an acceptable form of electronic receipt, enhancing customer convenience and aligning with modern technology practices.

Item under Consideration:
Amend Handbook 44, Section 1.10. General Code as follows:

G-S.5.6. Recorded Representations. – Insofar as they are appropriate, the requirements for indicating and recording elements shall also apply to recorded representations. All recorded values shall be presented digitally. In applications where recorded representations are required by a specific code, the customer may be given the option of not receiving the recorded representation. Recorded representations referenced in specific codes shall be made available to the customer in hard copy form, unless otherwise specified by the customer. For systems equipped with the capability of issuing an electronic receipt, ticket, or other recorded representation, the customer may be given the option to receive any required information electronically (e.g., via cell phone, computer, **unique and dynamic quick response QR code,** etc.) in lieu of or in addition to a hard copy.

(Amended 1975, 2014, ~~**and**~~ 2023, **and 20XX**)

Previous Status:
2025: Voting - Returned to Committee

Original Justification:
Integrating unique QR codes as an acceptable form of electronic receipt offers numerous benefits that align with the goals of modernizing transactional processes and enhancing customer convenience. QR codes provide enhanced accessibility as they can be easily scanned using mobile devices, offering a quick and efficient way for customers to access their receipts rather than having to input personal information to receive an emailed receipt. This eliminates the risk of losing physical copies and allows for more organized and easily retrievable records. QR codes have become ubiquitous across various industries, with a significant increase in their use for payment and information dissemination purposes. In fact, the global QR code payment market was valued at $9.98 billion in 2022 and is expected to expand at a compound annual growth rate of 16.9% by 2030.[1] Moreover, it's predicted that the global spend using QR code payments will reach over $3 trillion by 2025; rising from $2.4 trillion in 2022.[2]

From a technological standpoint, QR codes are highly versatile and can be integrated across various platforms and systems, making them adaptable to different business environments and customer preferences. Moreover, QR codes can be unique to individual customers and present transaction information via a payment terminal or kiosk. Lastly, digital receipts via QR codes can be encrypted, ensuring a secure means of transmitting transactional information and reducing

[1] Grand View Research, QR Code Payment Market Size, Share & Trends Analysis Report By Offerings, By Solution, By Payment Type, By Transaction Channel, By End-user, By Region, And Segment Forecasts, 2023 – 2030, (April 24, 2023).
[2] Juniper Research, QR Code Payments: Key Opportunities, Competitor Leaderboard & Marketing Forecasts 2022-2026, (May 2022).

the risk of fraud associated with other receipt types.

QR codes align with current standards as stipulated in Section G-S.5.6, which requires recorded representations to be printed digitally. QR codes can encapsulate all necessary information required by the standard and can be easily integrated into existing systems that comply with Handbook 44. As technology continues to advance, QR codes are likely to remain relevant and be supported by emerging technologies, ensuring long-term compliance and usability.

Potential opposing arguments, include technical barriers, privacy concerns, and implementation costs. While not all customers may have mobile device capable of reading QR codes, businesses can offer multiple options, including traditional printed receipts, to accommodate all customers. Maintaining redundancy and offering multiple options for consumers to receive receipts is essential for enhancing consumer trust and accommodating diverse needs and preferences. Privacy concerns can be mitigated by implementing secure methods of generating QR codes, which can include less personally identifiable information than paper receipts and other forms of digital receipts. Although there may be initial costs associated with transitioning to QR codes, these can be offset by long-term savings from reduced paper usage and improved operational efficiency, with many modern point-of-sale systems already supporting QR code generation with minimal additional investment. Moreover, there may be implementation costs for industries that already utilize digital receipts, such as expenses related to software updates. However, such providers can likely leverage existing infrastructure, minimizing the need for significant additional investment. Ensuring compliance with Handbook 44 when using QR codes can be achieved by standardizing the format and content of QR codes to provide all required information in a verifiable manner.

The submitters requested that this be a Retroactive Voting item in 2025.

Comments in Favor:

Regulatory:
2025 Annual: Tim White, Michigan Department of Agriculture and Rural Development, supports the item.
2025 Annual: Jason Flint, New Jersey Weights and Measures, supports Voting on the item with the additions of the "unique" and "dynamic", the current language. He also stated that in his opinion customers should get a physical receipt with QR as another option. He doesn't think the concern about QR codes is what's being voted on in this item, because nothing currently disallows QR codes as a receipt method.
2025 Annual: Mahesh Albuquerque, Colorado Division of Oil and Public Safety, supports the item with the new revisions. He also stated that the intent of this item is to provide clarification of something that is already allowed. Other electronic methods don't have additional specifications. He implored the body that we do really need to think about the concerns raised, and if valid, they should be added in a different section of the handbook for security.
2025 Annual: Mike Harrington, Iowa Department of Agriculture, supports the item.
2025 Annual: Steve Harrington, Oregon Department of Agriculture, stated that his colleagues have brought up good points, but he views this as a clarity item, as to what can be provided. He supports the item.
2025 Interim: Craig VanBuren, Michigan Department of Agriculture, stated that he can argue on both sides of whether a QR Code qualifies as an electronic method of receipt. He supports the item as written.
2025 Interim: Mahesh Albuquerque, Colorado Division of Oil and Public Safety, supports Voting status for this item using the WWMA amendments. He also noted that many people claiming this item is redundant are also saying that they understand the handbook to already allow QR Codes as acceptable forms of receipt. This item is just adding guardrails for that method, and otherwise we will be dealing with this down the road.
2025 Interim: Matt Williams, Texas Department of Licensing and Regulation, supports Voting status for this item.
2025 Interim: Mike Harrington, Iowa Department of Agriculture, supports Voting status for this item.
2025 Interim: Paul Floyd, Louisiana Department of Agriculture and Forestry, supports Voting status for this item.
2025 Interim: Mike Brooks, Arizona Department of Agriculture, stated that this item is not redundant because it specifies that the QR Code must be "unique". He also recommended either Developing status or Voting status.
2025 Interim: Steve Harrington, Oregon Department of Agriculture, recommended Developing status, but stated that he supports the item. He also stated that a philosophical discussion about adding examples to the handbook may need to take place since new technologies are widespread, can be misused, and the handbook may need these clarifications.

Industry:
2025 Annual: Corey Hainy representing the Scale Manufacturers Association submitted detailed written comments to the Committee and supports the item.
2025 Annual: John Hathaway, Murray Equipment, Total Controls, Supports the item. The companies he represents offer QR codes as a receipt method and they believe this is a positive alternative option to a printed receipt. He also stated that before this meeting he believed that QR codes were already allowed as a method of receipt. He now doubts that inspectors will approve QR codes and suggests downgrading the item to Developing, so that these issues can be addressed.
2025 Annual: Steve Griffith, National Electrical Manufacturers Association, supports the item and wants uniform guidance in the handbook.
2025 Annual: Steve Bright, Electrify America, supports the item because it brings clarity to the handbook. He understands the concern about lists of examples being added, but this ultimately gives clarity to an additional method for receipts.
2025 Annual: Justin Wilson, ChargePoint, supports the item as a valuable clarification that aligns with consumer preferences. He stated that it's really easy to screenshot a QR code linked receipt. He questioned what harm there was in adding clarity to the handbook. He stated that the code can always be updated in the future to add any specifics found to be needed, and that this item was a commonsense step forward. He also stated that he was concerned about the dialogue back and forth, one point being about whether QR codes were already allowed, and the other about the technical specifications for them. The question we are addressing today is whether they are currently an acceptable form of receipt delivery. Many have stated that they are already acceptable, and if that is the case additional safeguards can be added later, but vote Yea on this item, so we have clarity provided for the industry.
2025 Annual: Mal Skowron, Tesla, a joint submitter of the item, stated that she appreciates that many already interpret the code to allow the use of QR codes, but that's not universal. She believes that this item would establish that they can be a receipt option, and that clarity is needed for manufacturers. She also clarified how receipts are delivered via QR code. The code is a link that points to a PDF receipt that can be saved on its own. That PDF file is not alterable.
2025 Annual: Mike Frisnia, SWTCH Energy, supports the item and echoes colleagues, station owners, and site hosts in that they want to provide this.
2025 Interim: Tessa Sanchez, Tesla and speaking on behalf of the submitters, gave a presentation on this item; She stated that the entities she represents support the item as Voting. She also stated that there doesn't seem to be a consensus about this item being redundant, but did receive guidance that it should be clarified. She also responded to LA County, stating that taking a picture of the QR Code would not be a fraud concern because they are required to be unique or dynamic.
2025 Interim: Cory Hainy, representing the Scale Manufacturers Association, supports the item as Voting, with "unique" added to the QR Code description language. He also provided detailed written comments to the Committee.
2025 Interim: Steve Bright, Electrify America, stated that he thinks consistency is needed, and adding the example will clarify the handbook. He supports Voting status for this item.

Advisory:
2025 Interim: None

Comments Against:

Regulatory:
2025 Annual: Allison Wilkinson, Maryland Department of Agriculture, opposes the item. She stated that it is unnecessary as it is only an example. She also stated that she agreed with Dr. Curran from Florida and NIST OWM. As a regulator, she has concerns about receiving consumer complaints regarding receipts. She envisions consumers not being able to get the receipt or provide it to her for complaints. She suggests that clarity should be provided that the end product cannot be altered and that it lasts forever. She understands that QR codes and electronic receipts are needed, but more guidelines are necessary too. She recommends Withdrawal of this item, and that a new proposal be submitted to clear this up or even that a work group be formed to explore the issues that have been raised.
2025 Annual: Matt Douglas, California Division of Measurement Standards, stated that he agrees with NIST, opposes the item, and recommends Withdrawal. He does not feel this item is redundant but is concerned that QR codes would become the de facto receipt method, eliminating consumer choice. He believes that real guidelines need to be

established for QR codes such as display length, and the inability for a consumer to successfully scan. He also stated that without specifications, he agrees that QR codes could reference a PDF, but that's not what he's seen. He's seen them go to a series of links. He believes we must have a specification that requires the post transactions PDF representation with display length.
He pointed out that there is no recourse for the QR code disappearing prematurely if it's not in the specifications. He also provided written comments to the Committee.
2025 Annual: Kristin Walter, Arkansas Bureau of Standards, opposes the item and recommends Withdrawal. She agrees with Maryland's comments and believes the regulation is already clear.
2025 Annual: Robert Huff, Delaware Department of Agriculture, recommends Withdrawal.
2025 Annual: Kurt Floren, Los Angeles County, stated that he was initially neutral on this item, but has been swayed to oppose it until the concerns raised have been fixed. He believes this will need to be type evaluated as a software issue.
2025 Annual: Steve Timar, New York, recommends Withdrawal if the item can't be reworked.
2025 Interim: Jason Flint, New Jersey Office of Weights and Measures, stated that he agrees with NIST OWM about not adding examples to the handbook. He also stated that he believed QR Codes were already allowed as a form of electronic receipt. He supports withdrawing this item.
2025 Interim: Matt Douglas, California Division of Measurement Standards, stated that he agrees with NIST OWM and recommended Withdrawn or Developing status. The device should ensure that the customer receives a permanent recorded representation, and it needs the safeguards referenced in the WWMA comments. He also clarified that his position on this item is that the language does not satisfy the spirit of our model law. It needs a lot of parameters that would not normally apply, and the process is not clearly vetted and identified.
2025 Interim: Steve Timar, New York Department of Agriculture & Markets, stated that he doesn't believe the example is needed, that it is redundant, and that QR Codes are already allowed. He recommended it be Withdrawn.

Industry:
2025 Annual: Michael Kielty, Endress + Hauser Flow USA, Inc., stated that a comment attributed to him in Publication 16 was incorrect. He does NOT think that there should be a possibility for consumers to not receive a printed receipt if they want one. He thinks the QR code conversation is going down the path that the seller can opt not to provide a printed receipt. This general code was intended to allow electronic forms as an option for the consumer. He opposes this item on the premise that the consumer can always choose to have printed receipt. He recommends Withdrawal, and that someone come forward to strengthen language about consumer receiving a printed receipt.
2025 Interim: Dmitri Karimov, Liquid Controls, opposes adding examples to the handbook and recommended either Withdrawn or Developing status with all examples struck for this item.

Advisory:
2025 Annual: Loren Minnich, NIST OWM, provided detailed written comments to the committee. He recommended Withdrawal of the item, since examples do not actually create limitations in the handbook. NIST OWM's position is that real guidelines need to be put into place to ensure QR codes are being used properly, and since they pose a security risk. They do not believe that this item provides the necessary changes to address the issue.
2025 Interim: Jan Konijnenburg, NIST OWM, suggested either Withdrawn or Developing status for this item. He stated that the current language raises questions, QR codes are already allowed, and he thinks it's unnecessary to add all kinds of examples and he discouraged doing so. He also stated that he does not believe that a QR code is a receipt, just a pathway to one, and that this item provides no assurance that the customer has unrestricted access to the transaction receipt or that they will not be required to pay for access. NIST OWM provided detailed written analysis for this item to the Committee.

Neutral Comments:

Regulatory:
2025 Annual: Matt Curran, Florida Department of Agriculture and Consumer Services, stated that he was neutral on this item, but that they require QR codes to be on select food packages in Florida, and they have found that when violations are discovered, businesses can change the information that the QR codes link to. This should not be a possibility for QR code receipts. He also provided written comments to the Committee.

2025 Annual: Jose Arriaga, Orange County, California, generally supports allowing QR codes and provided some edits for clarification. Change language to customer can "opt" for QR code. On electronic representations there should be a requirement for how long the QR code must be displayed on the screen so consumers can't miss it.
2025 Interim: Khoa Lam, Los Angeles County CA, asked if the QR Code would be saved forever or recycled for future transactions. His main concern is fraud, and he cited an example of a fraudulent QR code sticker being placed on a device. He recommended Developing status.

Industry:
2025 Annual: Dimitri Karimov, Liquid Controls, stated that he has seen two types of QR codes. One is local and acts as a mirror of the printed ticket. The other shows information stored on the cloud. He suggested that this could be an area to clear things up.
2025 Annual: James Leung, Zerova Technologies, an EV manufacturer, stated that California already regulates this, requiring what's on the receipts.
2025 Interim: Michael Kielty, as a consumer, stated that it should always be permissible to not receive a paper receipt. The consumer can choose based on this language. The button in Tesla's presentation only offered the QR Code receipt option. He recommends Developing status until there is an assurance that the customer will always have the option of receiving a paper receipt.

Advisory:
2025 Interim: None

Item Development:
NCWM 2025 Annual Meeting: The Committee agrees that QR codes are a method of delivering a receipt that is already allowed by G-S.5.6., and the additional example is not needed, therefore the Committee is withdrawing the item. However, the Committee believes that more clarification is needed as to what constitutes an electronic receipt and how to properly deliver it to address the security concerns that have been raised.

NCWM 2025 Interim Meeting: The Committee updated the language in the proposal using the submitters' amended language, which included the 2025 version of G-S.5.6. Recorded Representations. The Committee believes the item has merit, is fully developed, and has assigned Voting status to the item.

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

During the WWMA 2025 Annual Conference the following comments were received:

Mr. Aaron Yanker (WWMA S&T Committee Chair): Updated the body to the status of the item as Withdrawn by the NCWM 2025 S&T Committee.

As a point of clarification, this item went to vote at the 2025 NCWM Annual Conference and was returned to the 2025 NCWM S&T Committee. It was incidentally included in the 2025 WWMA S&T agenda as a carry-over from the 2025 NCWM Annual Conference.

The 2025 WWMA S&T committee recognizes the 2025 NCWM S&T position of Withdrawal of this item.

The WWMA S&T Committee has no recommendation for this item.

CWMA 2025 Interim Meeting:

Withdrawn during 2025 NCWM Annual meeting. No comments were taken.

NEWMA 2025 Interim Meeting:

No comment. No recommendation.

SWMA 2025 Annual Meeting:

The 2025 SWMA S&T Committee heard the following comments:

Matt Curran, Florida – The National S&T assigned Withdrawn status – no comments to be heard.

The item is Withdrawn.

Additional letters, presentations and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents.

GEN-26.5 G-S.5.6. Recorded Representations and Appendix D – Definitions: electronic receipt.

Source:
NCWM National Type Evaluation Program Committee

Purpose: Remove the examples from G-S.5.6. Recorder representations and add a definition to HB 44 for Electronic Receipts to assist in clarification for regulatory, manufacturers and NTEP as to what an electronic receipt is.

Item under Consideration:
Amend NIST Handbook 44 General Code and Appendix D as follows.

G-S.5.6. Recorded Representations. – Insofar as they are appropriate, the requirements for indicating and recording elements shall also apply to recorded representations. All recorded values shall be presented digitally. In applications where recorded representations are required by a specific code, the customer may be given the option of not receiving the recorded representation. Recorded representations referenced in specific codes shall be made available to the customer in hard copy form, unless otherwise specified by the customer. For systems equipped with the capability of issuing an electronic receipt, ticket, or other recorded representation, the customer may be given the option to receive any required information electronically ~~**(e.g., via cell phone, computer, etc.)**~~ in lieu of or in addition to a hard copy. (Amended 1975, 2014, 2023 and 20XX)

and

electronic receipt. – An electronic version of a recorded representation in the form of a downloadable PDF or HTML file accessed or delivered via email, Dynamic QR Code, Short Message Service (SMS) or approved Mobile Device application installed on a Smart Phone or Tablet. A Toll -Free Customer Support Number may also be utilized to request an electronic receipt via email or SMS.
(Added 20XX)

Previous Status:
2026: New Proposal

Original Justification:
Having a definition for an electronic receipt will benefit industry, the regulatory community and NTEP and promote uniformity.

Comments in Favor:

Regulatory:
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Industry:
•

Advisory:
•

Comments Against:

Regulatory:
•

Industry:
•

Advisory:
•

Neutral Comments:

Regulatory:
•

Industry:
•

Advisory:
•

Item Development:
New Proposal

Regional Associations' Comments:
This item from the NTEP Committee was not developed in time for the 2025 fall regional association meetings.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents.

SCL – SCALES

SCL-24.2 D Multiple Sections Regarding Tare

Source:
Ross Andersen, New York, Retired

Purpose:
Reduce confusion regarding net weight and tare issues by defining terms and adds specific requirements for tare operations and for marking and printing of net, gross and tare weight values.

Item under Consideration:
Amend Handbook 44, Section 2.20. Scales Code and Appendix D, Definitions as follows:

NOTE: This proposal and justification were modified by the submitter before the fall 2025 regional association meetings.

Based on comments received and extensive discussion with OWM staff, I submit this revised proposal as part of the continuing development of this item. This revision replaces the original item.

The proposal consists of three sections. Part 1. establishes the terminology that is important to understand the meaning of key terms. Part 2. addresses the question of proper testing of weighing instruments, both gross and net indications. Part 3. addresses identification of indicated weight, recorded weight values, and externally calculated weight values. Part 3 also includes the subject of mathematical agreement.

Part 1. Preliminaries: Terminology of Weighing

The language surrounding "weight" is highly nuanced. This reflects thousands of years of evolution in commercial activity and even radical changes that occurred within my lifetime with the invention of digital weighing instruments. The important issue is that a weighing instrument provides weight indications reacting to whatever load it senses. It is the operator that operates the instrument and converts these weight indications into weight values that are used in the commercial transaction based on knowledge of the specific load or loads involved in the weighing operation. The applicable rules for weight indications and weight values are:

- Weighing instruments produce **weight indications** reacting to changes in applied load in real time. Analog indications are unrounded, but Digital indications are rounded per G-S.5.2.2.(c).

- Weighing instruments may record **weight values** from weight indications. Analog must comply with G-S.5.2.2.(b) and digital must comply with G-S.5.2.2.(a)&(d). *Recorded values don't change with applied load.*

- Weighing instruments may externally calculate **weight values** from two measured weight values using the formula: Gross – Tare = Net (and variations).

Analog instruments have a single scale of weight indication beginning at no load zero balance. All digital instruments have a scale of indication beginning at no-load zero parallel to the analog instruments. Some digital instruments have a tare mechanism and will have two scales, one beginning at no-load zero and the other beginning at tare load zero after operation of a tare mechanism.

The loads used by the operator in the weighing process are as follows:

- Dead load – meaning the load receiver and support structure.
- No load – meaning the dead load plus any additional load that is not part of the transaction, e.g., the scoop used with a computing scale in a candy store, or dirt and debris that accumulates on a vehicle scale.
- Service load – meaning the item(s) subject to a charge for service based on weight. The terms gross, tare and net have no relevance to a service load.
- Tare load – meaning the tare materials delivered with the commodity.
- Net load – meaning the commodity.
- Gross load – meaning the net load plus the tare load.

The term weight in common usage has the following variants.

- Weight, or gross weight – meaning (a) the indication of an instrument on the measurement scale beginning at no load zero, (b) the weight value derived from weight or gross weight indications for any load, or (c) the weight value derived from weight indications for the gross load.
- Net weight – meaning (a) the indication of an instrument on the measurement scale beginning at tare load zero, (b) the weight value derived from net weight indications for any load, or (c) the weight value derived from net weight indications for the gross load.

The key is that weight values must be derived from indications and require the operator to identify the associated load. Another important takeaway is that multiple meanings for the same term results in always being forced to consider the context to understand the requirement.

Part 2. Testing Procedures for Weighing

Amend section S.1.1. . and add a new section S.1.1.3. as follows:

S.1.1.1. Digital Indicating Elements.

(a) A digital zero indication shall represent a balance condition that is within ± ½ the value of the scale division d. **This does not apply to weight classifiers or to the counting feature on prescription scales.**

(b) After zero-setting (gross zero or net zero after a tare operation) the effect of zero deviation on the result of the weighing shall be not more than ***~~± 0.25 e.~~:***

(i) ± 0.5 e for Class IIIL scales and Class IIII highway weight enforcement scales with values of n = 400 or greater, or

(ii) ± 0.25 e for all other scales. On a multi-interval scale, e shall be replaced by e_1.

(Amended 202X)

[Nonretroactive as of January 1, 2025]

(c) A digital indicating device shall have a "center-of-zero" indicator that indicates a zero-balance condition when the deviation from zero is not more than ***~~± 0.25 e~~ the corresponding values in S.1.1.1.(b)****. A "center-of-zero" indicator may operate when zero is indicated for gross and/or net mode(s). The "center-of-zero" indicator is not mandatory on a device equipped with an auxiliary indication or equipped with an enabled zero tracking mechanism that maintains a "center-of-zero" condition* ***~~to ± 0.25 e~~ compliant with S.1.1.1.(b).***

(Amended 202X)

[Nonretroactive as of January 1, 1993]

(d) For electronic cash registers (ECRs) and point-of-sale systems (POS systems) the display of measurement units shall be a minimum of 9.5 mm ($^3/_8$ inch) in height.

[Nonretroactive as of January 1, 2021]

(Added 2019)

(Amended 1992, 2008, 2019, and 2024)

S.1.1.3. Analog Indicating Elements. – After zero-setting the effect of zero deviation on the result of the weighing shall be not more than:

(a) ± 0.5 e for Class IIIL scales and Class IIII highway weight enforcement scales with values of n = 400 or greater, or

(b) ***± 0.25 e for all other scales.***

[Nonretroactive as of January 1, 202X]

(Added 202X)

Add a new Note N.1.13., and amend T.N.2.1. and T.N.3.3. as follows:

N.1.13. Testing Requirements. – When measuring errors for compliance with Table 6., the following shall apply.

(a) For Class IIIL scales and Class IIII highway weight enforcement scales with values of n = 400 or greater, the test load shall be applied at a zero/reference value accurate to ± 0.5 e, and the error calculation shall resolve the error to the nearest 1 e.

(b) For all other scales, the test load shall be applied at a zero/reference value accurate to ± 0.25 e, and the error calculation shall resolve the error to the nearest 0.2 e.

(Added 202X)

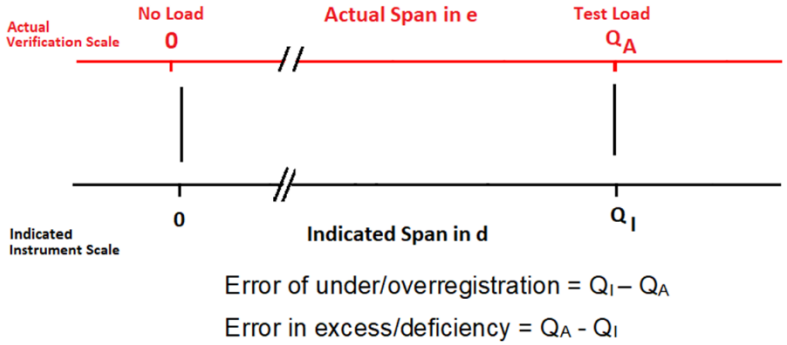
T.N.2.1. General. – The tolerance values ~~**are positive (+) and negative (–)**~~ **herein prescribed shall be applied to errors of overregistration and underregistration.** ~~**with the weighing device adjusted to zero at no load. When tare is in use, the tolerance values are applied from the tare zero reference (zero net weight indication); the tolerance values apply to the net weight indication for any possible tare load using certified test loads.**~~ **The tolerances apply to errors in gross indications when no tare mechanism is in use, and they apply to errors in net indications when a semi-automatic tare mechanism is in use. (See N.1.13.)**

T.N.3.3. Wheel-Load Weighers and Portable Axle-Load Weighers of Class IIII. – The tolerance values are two times the values specified in T.N.3.1. Maintenance Tolerance Values and T.N.3.2. Acceptance Tolerance Values **for scales with n of 400 or greater.**

(Amended 1986 **and 202X**)

Justification: The current S.1.1.1.(a) was written for normal rounding scales. The +/- 0.5 division is an absolute requirement meaning zero must extend from -0.5 d to + 0.5 d and must be 1 d wide. The new exemption in part (a) for weight classifiers is necessary because classifiers round mostly up instead of half up/half down. The width of the zero division is typically much smaller than 1 d for these instruments to provide for rounding up. The exemption in part (a) for pill counters is necessary because counting scales round mostly down. The zero pill indication could extend from no load to just under 1 pill (both plus and minus) making the zero division almost 2 d wide. Both of these types of scales are covered by the accuracy of zero requirements in part (b) ensuring center of zero is accurate.

The error in the Scales Code is calculated from the indication on the instrument scale (in d) and a test load on the verification scale (in e). See figure below. After aligning the zeros of the two measurement scales, you calculate error of under/overregistration as indicated quantity Q_I minus actual quantity Q_A with quantity in weight units. For this to work effectively, the zeros must be accurately aligned and the rounding error in the error calculation must be minimized. Note the small offset between the zeros.



The current zero accuracy requirement in S.1.1.1.(b) of +/- 0.25 e was clarified in amendments made 2024. However, the tolerance structure of class IIIL and IIII highway weight enforcement scales is very different from the other classes with many more e's of tolerance (up to 20 for IIIL and up to 10 for IIII). The 0.25 e accuracy of zero error becomes excessively small for these devices, for example, +/- 5 lb on a 200,000 lb x 20 lb IIIL vehicle scale. This is almost at the limit of detection. After the change, any zero indication within +/-10 lb (+/-0.5 d) is sufficiently accurate. More on this subject follows below. This is reflected in the new test note as well.

The n = 400 or greater limitation for weight enforcement scales is similar to the 2,000 minimum n for class IIIL. Permitting twice the tolerance when n is less than 400 can increase the relative tolerance to 4 %, e.g., 2 e at 50 e load. A

search of NTEP approve weight enforcement scales did not reveal any instruments currently with n values less than 400. It is not necessary to update the nonretroactive dates in S.1.1.1.(b) or (c) as the new requirement is less stringent for the class IIIL and highway weight enforcement scales. Note, the accuracy of zero also applies to a strain-load reference value in a strain-load test which will be a non-zero value.

The new paragraph S.1.1.3. is necessary to apply the accuracy of zero requirements equally to analog instruments. This recognizes that analog zero adjustments may have finite variability.

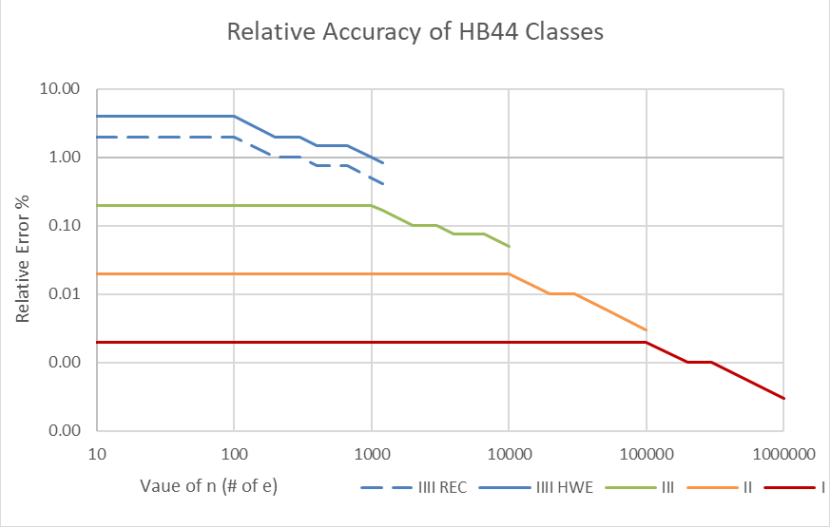
The new test note N.1.13. sets both zero accuracy requirements and resolution requirement for testing the scale. More information of the tolerance structures in the Scales Code and the issue of resolving errors is added below.

The changes to T.N.2.1 clarify that tolerances apply to errors of under/overregistration. The current plus or minus could also be errors in excess/in deficiency. The deleted language is clarified to explain how to conduct the tests to apply the tolerances to both gross and net indications. The limitation to semi-automatic tare reflects the fact that net zero is not normally seen at any time in the transaction and that accurate zero to S.1.1.1.(b) cannot be assumed with these tare methods. Semi-automatic tare must comply with S.1.1.1.(b).

Understanding Scales Code Tolerances

With the step tolerances in the Scales Code, the increased tolerances with increased test loads give us a false sense that tolerances increase as test loads increase. Yet the tolerances are actually decreasing when you look at them relatively rather than absolutely. In addition, we expect weighing instruments to be close to linear in performance. This is why we test at the maximum load in each tolerance step. The result, as the capacity moves into the second, third, or fourth step, is decreased probability of failing at lower steps.

The relative accuracy of the HB44 weight classes in the Scales Code (other than IIIL) are presented in the graph below. The scale tolerances based on relative error can be thought of as tolerance at capacity divided by the capacity, or e's of tolerance divided by n. The basic principle is that more e's generally reflects more accuracy (smaller tolerance) both within a class and between classes.



- Class IIII for highway weight enforcement ranges from 2 e per 50 e or 4% to 10 e per 1,200 e or 0.8%.
- Class IIII for recycling ranges from 1 e per 50 e or 2% to 5 e per 1,200 e or 0.4%.
- Class III ranges from 1 e per 500 e or 0.2% to 5 e per 10,000 e or 0.05%.
- Class II ranges from 1 e per 5,000 e or 0.02% to 3 e per 100,000 e or 0.003%.
- Class I ranges from 1 e per 50,000 e or 0.002% to 3 e per 1,000,000 e or 0.0003%.

Class IIIL is an anomaly, since it does not follow the principle of increasing accuracy with larger n. This class is a constant 0.2% tolerance over the entire class range from n = 2,000 to n = 10,000. The connection to class III is that class IIIL shares the same relative tolerance (0.2%) as Class III up to 1,000 e. The key is to see that the e and d of IIIL are significantly smaller than the equivalent class III for n up to 1,000. If you make a 0.2% accurate class III instrument with 200,000 lb capacity, you get a d of 200 lb. Yet the equivalent class IIIL has 20 lb d. In many respects class IIIL is like having auxiliary indication for class III. Consider the comparison table below for a 200,000 lb scale.

Consideration	III	III	IIIL
Scale Division d/n	20 lb/10,000	200 lb/1,000	20 lb/10,000
Tolerance @ 100 k/200 k	100 lb/100 lb	200 lb/400 lb	200 lb/400 lb
Suitable Test Load	80,000 lb	100,000 lb	30,000 lb
Accuracy of Zero	5 lb	50 lb	10 lb
AZT Window	10 lb	100 lb	60 lb
Print Stability	20 lb	200 lb	60 lb
Minimum Load	400 lb	4,000 lb	1,000 lb

If we tried to fit a 200,000 lb x 20 lb scale (column 2) into class III, not only do the tolerances get far too small but you also are faced with stringent requirements (shaded areas) such as:

- testing at a minimum of 80,000 lb to test at 4,000 e with its 60 lb (3 e) tolerance.
- trying to enforce 0.25 e accuracy at zero which is at the limit of detection.
- the scale would have to return to zero within 10 lb in order to get into the AZT window of ½ d.
- indication stability would have to be within 20 lb (+/-1 d) to print with wind.
- the 20 d minimum load would permit weighing down to 400 lb.

Increasing the d to 200 lb (column 3) returns the tolerances to the current 0.2% but some of those values that were too small at 20 lb d now are too large, like the 200 lb print motion and 4,000 lb minimum load. Class IIIL with its smaller 20 lb divisions (column 4) solved many problems (and required a good number of compromises).

Class IIII weight enforcement scales in contrast to class IIII follow a similar pattern to the IIIL vs III. The doubling of the tolerance along with the n = 400 minimum solved many problems.

Consideration	IIII	IIII	IIII(2xT)
Scale Division d/n	50 lb/400	200 lb/100	50 lb/400
Tolerance @ 10 k/20 k	100 lb/150 lb	200 lb/400 lb	200 lb/300 lb
Accuracy of Zero	12.5 lb	50 lb	12.5 lb
AZT Window	25 lb	100 lb	25 lb
Print Stability	50 lb	200 lb	50 lb
Minimum Load	500 lb	2,000 lb	500 lb

Resolving Errors

NTEP specifies that error calculations be resolved to 0.2 e or finer parallel to R76, reducing rounding error to a maximum of 0.1 e. The resolution of the error to 0.2 e is important because the value of d may be smaller than e with auxiliary indication, larger than e for most weight classifiers, greater than 3 e for counting scales, and equal to e for other scales. When computing error ($Q_I - Q_{A)}$ the different resolution of the indication results in very different resolution in the error.

This means rounding errors in calculating the error may be 0.05 e with e = 10 d auxiliary indication, ~10 e with e = 0.1 d weight classifiers, ~3 e with e = 0.33 d counting, and 0.5 e for other scales. R76 stipulated 0.2 e or finer to standardize the measurement of error. The principle is that once error resolution is reduced to 0.2 e or less, rounding error is considered insignificant.

The codification of these parameters formally authorizes the NTEP practices and clarifies that the rounding error is not included in the tolerances in Table 6. This does not prevent field tests from resolving errors to 1 e, when considering enforcement discretion. Just as many tests are not normally performed in field tests, this test may be modified for convenience with the full understanding that the practice can significantly increase the tolerances above the intended values.

To resolve error calculations to 0.2 e you can use one of three test methods:

1. Test at a whole number of e and resolve the indication to 0.2 e of finer. For example, for class II at the first tolerance step apply a load of 5000 e and resolve the indication to 0.2 e by (a) interpolating the analog indication to 0.2 e or finer, (b) by using indications with auxiliary indication to 0.2 e or finer, or (c) using extended display mode with temporary d = 0.2 e or finer.
2. Test at a whole number of d and apply test load in increments of 0.2 e or finer. For analog the test begins at the zero graduation and ends at a load graduation by adjusting the test load. For digital, the break points between divisions is used beginning at 0.5 d and ending at the test indication +0.5 d. For the first step in class III this could mean a final indication of 500.5 d. The span from 0.5 d to 500.5 d is precisely 500 d.
3. Test at a random point (as with the dynamic monorail). The instrument records values with auxiliary indication to 0.2 e or finer and the actual value is found on a reference scale with verified scale divisions = 0.2 e or finer.

The proposed resolution of the error for classes IIIL and IIII weight enforcement is to the nearest 1 e. This means error weights are not require ever to test these scales. The important issue is how rounding error in the indication impacts the pass/fail threshold. Remember, in field tests the instrument has to fail in order to take action. You find the fail threshold by adding the rounding error to the tolerance.

Consider a class III scale when testing at 500 e where the tolerance is 1 e or 0.2%, If you resolve error to 1 d, the rounding error is 0.5 d or e. This means you will not fail the scale until the error exceeds 1.5 e or 0.3%. That's 50 % more than the Table 6. tolerance. If you resolve the error to 0.2 e as described above, the rounding error is reduced to 0.1 e and you will not fail until the error exceeds 0.22%. This explains why HB44 directs that tests be performed at the tolerance break points which represent the tightest tolerance in each tolerance step. It also partially explains why class IIIL was created.

With large capacity scales of class III it would be a hardship to test at the first tolerance break point at 500 e. Consider a IIIL of 200,000 lb with d/e = 200 lb. That requires 100,000 lb of test weights to get to the tolerance break point. Bringing 4 weight trucks to test a single scale is not an acceptable solution. Often you can only muster 150 e (30,000 lb) of test weights where the fail threshold is 1%. That's not a meaningful test.

For large capacity Class III with error resolution 1 d

@ 500 e load – (1 e tolerance + 0.5 e rounding error) / 500 e * 100 = 0.30 % fail threshold

@ 150 e load – (1 e tolerance + 0.5 e rounding error) / 150 e * 100 = 1.0 % fail threshold

Now follow R76 rule of resolving error to 0.2 e. The fail threshold is better, 0.22 % at 500 e, but it is still 0.73% at 150 e. Again this cannot hold the scale to 0.2% error.

For large capacity Class III with error resolution 0.2 d

@ 500 e load – (1 e tolerance + 0.1 e rounding error) / 500 e * 100 = 0.30 % fail threshold

@ 150 e load – (1 e tolerance + 0.1 e rounding error) / 150 e * 100 = 0.73 % fail threshold

This rounding issue s is one reason class IIIL was created. Consider a class IIIL with e = 20 lb resolving error to 1 e. The values below show the fail threshold at the first four steps. Even at only 30 k test load the effective tolerance is very close to the 0.2% desired. Also, this test is repeated upscale with the strain-load test evaluating the 0.23 accuracy over another part of the weighing range.

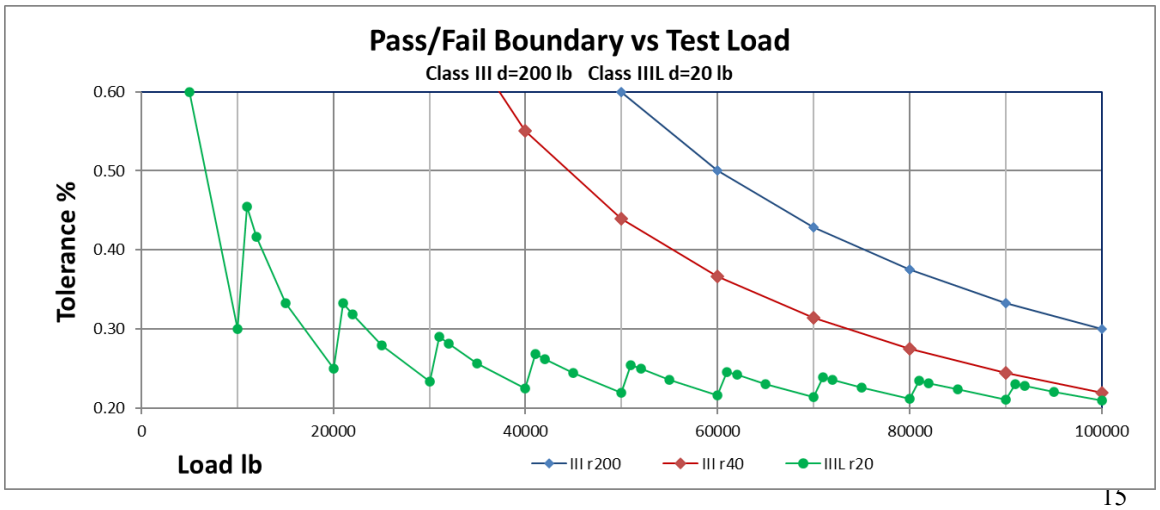
For Class IIIL error resolution 1 e (direct reading to nearest d means 0.5 e rounding error)

@ 500 e load – (1 e tolerance + 0.5 e rounding error) / 500 e * 100 = 0.3 % fail threshold

@ 1,000 e load – (2e tolerance + 0.5 e rounding error) / 1,000 e * 100 = 0.25 % fail threshold

@ 1,500 e load – (3 e tolerance + 0.5 e rounding error) / 1,500 e * 100 = 0.23 % fail threshold
@ 2,000 e load – (4 e tolerance + 0.5 e rounding error) / 2,000 e * 100 = 0.23 % fail threshold

In the graphic below, the fail thresholds are shown for class III with d = 200 lb and class IIIL with d = 20 lb. The blue line for class III depicts rounding to nearest d (200 lb) while the red line for class II depicts rounding to the nearest 0.2 d (40 lb) as proposed. The green line for class IIIL depicts rounding to nearest 1 d (20 lb). This means rounding error to 1 e is sufficient to evaluate the 0.2 % tolerance for class IIIL.



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Note that NTEP presently uses the 0.2 e resolution for class IIIL. Consider that in tests close to CLC you are using 4 lb error weights to evaluate a tolerance of maybe 160 lb.

Part 3. Identification of Weight Indications and Recorded and Calculated Weight Values

Add a new S.1.15. and S.1.16. as follows:

S.1.15. Identification of Weight Indications.

(a) Gross indications need not be identified, but may be identified by the symbol "G" to the right of the weight value, e.g., 4.48 kg G.
(b) Net indications shall be identified by the symbol "N" to the right of the weight value, e.g., 4.48 kg N.
(c) However, it is permitted to replace the symbols "N" or "G" with the terms "net" or "net weight", or "gross" or "gross weight" respectively adjacent to the weight display.

(Added 20XX)

(Nonretroactive as of January 1, 202X)

S.1.16. Identification of Recorded and Calculated Weighing Results.

(a) Recorded values shall match associated indicated values, including any gross or net identification of the corresponding indication using the symbols "G" or "N" to the right of the weight value, e.g., 4.48 kg G.

(b) If only net weight values are recorded without corresponding gross or tare values, they may be recorded without any identification. This applies also where semi-automatic zero setting and semi-automatic tare are initiated by the same key.

(c) Recorded values may include additional gross, net, and/or tare identification based on operator knowledge of the applied. If gross, tare, and net weight values are all recorded together, the net and tare values shall at least be identified by the corresponding symbols “N” and “T.”

(d) However, it is permitted to replace the symbols “G”, “N” and “T” by corresponding text, e.g., “gross” or “gross weight,” “net”, or “tare” respectively either before or after the weight value, e.g., 10 kg N or Net 10 kg.

(e) When gross, net and tare values are recorded together, one of these values may be calculated from two recorded weight values based on the formula Gross – Tare = Net. The calculation shall be mathematically correct. See Note. In the case of a multi-interval or multiple range scale the calculated weight value may be presented with a smaller scale division. Example:

455 kg	Gross Weight (WR2 d = 5 kg)
- 14 kg	Tare Weight (WR1 d = 2 kg)
= 441 kg	Net Weight (mathematically correct but d is 1 kg)

Note: when gross, net, and tare values are recorded together and all three values are independently measured, it is not possible to ensure mathematical agreement due to rounding errors.

(Nonretroactive as of January 1, 202X)

(Added 20XX)

Justification: These new sections provide clear specifications for identifying net weight and the use of tare mechanisms. Because these changes may be significant, they are proposed as nonretroactive. There is nothing in the Scales Code to specify how to identify weight indications and recorded values. Without these sections, any decisions regarding appropriate identifications are arbitrary. Note that NTEP relies heavily on G-S.5.2.4. Values, but general rules are not sufficient in this case. Also, Pub 14 has no legal standing and HB44 must be clear on its own.

The new S.1.15. recognizes that indications can only be gross or net. Not identifying gross indications is a long-standing practice, and this requires an explicit exemption from G.S.5.2.4. However, these indications may be identified as gross. Net weight indications, when a tare mechanism is in use, must be identified as net. A tare weight display is a recoded value covered in the proposed S.1.16. The OWM has suggested this could be accomplished through examples of acceptable indications or by combining indications and recorded requirements. However, legal requirements cannot be expressed through examples. Examples are only used to further clarify stated requirements and could be valuable in a comprehensive training program for weight indications.

In S.1.16. the specifications governing recorded and calculated weight values are added. This section comes largely from R76 section 4.6.11. This is presented separate from indications in S.1.1.5., since it adds multiple layers of options that are not suitable for indications.

In (a) the General Code principle (G-S.5.2.2.) that recorded values should mirror the associated indications is reinforced. If the indication has gross or net identification, then the recorded values must include it as well.

In (b) Net values presented alone (no gross or tare weights) are exempt from identification consistent with the UWML definition of Net Weight. This includes weighing the net load with gross indications as well as gross load with net indications. In the latter case, the indication is required to identified “net” but the recorded value is exempt.

In (c) the option for the operator to add information that is not available from the indication is recognized. The scale can only indicate gross or net weight and cannot know what load is on the load receiver. The operator knows that the gross indication of the tare load is Tare Weight, the gross indication of the gross load is Gross Weight, the gross indication of the net load is Net Weight, and the gross indication of the service load is weight.

It is the operator that adds this information through controls on the instrument. This section also exempts Gross Weight from being identified when gross, tare and net are presented. Gross is exempted since there is a long standing trade practice to not require identification of gross indications, also from R76.

In (e) the calculation of weight values is permitted, based on using two recorded weight values and calculating the third using the formula gross – tare = net. In this sense, calculation is external to the weighing capability of the instrument. A good example is the weigh-in/weigh-out system. The net weight is calculated by subtracting the tare weight from the gross weight. This is unlike internal calculations for keyboard or programmed tare performed internally. The example shows that the calculated value has a 1 kg d that is smaller than either the 2 kg or 5 kg d of the instrument indications.

The note is vital to explain that if gross, tare, and net values are each measured independently with semi-automatic tare, 25 % of the time the results will not be in mathematical agreement due to rounding errors. For example, with d = 1 lb and gross = 23.7 lb, tare = 3.4 lb and net = 20.3 lb, the corresponding measured values indicated and recorded will be 24 lb G, 3 lb T and 20 lb N (no mathematical agreement). This particularly impacts multiple range and multi-interval scales. If all three values are measured, the agreement of digital values in G-S.5.2.2. requires that digital values indicated and recorded agree exactly. If gross, net and tare values are all measured they may be in different weighing ranges it is likely that they will not be in mathematical agreement.

The Office of Weights and Measures has suggested that the calculated value part of S.1.16. be put in a separate section. The proposal keeps it with recorded values because the scale is using recorded values to perform the calculations. The proposal followed R76 as these were all in the same section.

Comments in Favor:

Regulatory:
2025 Interim: None

Industry:
2025 Interim: None

Advisory:
2025 Interim: Loren Minnich, NIST OWM, NIST OWM supports the item but stated that it is not yet fully developed. They are working with the submitter to make the needed updates and recommend Developing status.

Comments Against:

Regulatory:
2025 Interim: None

Industry:
2025 Interim: Corey Hainy, Scale Manufacturers Association, does not support this item based on the previous language and recommends Withdrawal. The SMA also provided detailed written comments for this item to the Committee.

Advisory:
2025 Interim: None

Neutral Comments:

Regulatory:
2025 Interim: Matt Douglas, California Division of Measurement Standards, recommended Developing status. He also provided detailed written comments to the Committee which are available in the supporting documents section of the NCWM website.
2025 Interim: Mike Brooks, Arizona Department of Agriculture, recommended Developing status and for the submitter to work with NIST OWM.

Industry:
2025 Interim: None

Advisory:
2025 Interim: None

Item Development:
NCWM 2025 Annual Meeting: No comments were heard at the Annual Meeting. The Committee looks forward to the continued development of the item.

NCWM 2025 Interim Meeting: The Committee assigned Developing status to this item based on the comments heard during Open Hearings. The Committee encourages the submitter to continue developing the item and to work with NIST OWM to address the issues that have been raised.

Contact: Ross Andersen, New York, Retired
rjandersen12@gmail.com

NCWM 2024 Annual Meeting: The Committee heard no comments on this item. The committee looks forward to further development of the item by the submitter and encourages input from all relevant stakeholders.

NCWM 2024 Interim Meeting: The committee made formatting changes to the item to make it consistent with the Form 15. The committee also renumbered paragraphs S.1.15. - S.1.17. to S.1.16. - S.1.18. along with relative references in the justification.

The committee recommends that the submitter develop the item further, possibly breaking it up into separate items and developing them individually. The submitter should also clarify where paragraphs S.2.3.1. Tare Mechanism and S.2.3.2. Preset Tare Mechanism are intended to be inserted.

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

During the WWMA 2025 Annual Conference the following comments were received:

Mr. Cory Hainy (Scale Manufactures Association): SMA does not support this item. SMA does not see confusion with the current language and does not warrant the changes to this section of the handbook. SMA recommends the item be Withdrawn.

Mr. Matthew Douglas (State of California, Division of Measurement Standards): As presented, he is having difficulty with what language is part of the amendments. It is difficult to identify what parts were under consideration. The language is confusing for enforcement, recommended a Developing status.

Mr. Loren Minnich (NIST Office of Weights and Measures): Confirmed NIST OWM has not had time to develop their analysis yet.

The 2025 WWMA S&T Committee recommends that this item remain Developing. The Committee recommends that

the submitter continue to work with NCWM to further develop the item and clarify the language.

The Committee additionally recommends that the submitter of the item address the formatting and move the justification found throughout this item to the appropriate section under Original Justification.

CWMA 2025 Interim Meeting:

Hearing no comments, the Committee recommends this item remain Developing.

NEWMA 2025 Interim Meeting:

Representative from NJ –Asked whether the committee was aware that the submitter is working with NIST on this item. Recommended developing status.

SWMA 2025 Annual Meeting:

The 2025 SWMA S&T Committee heard the following comments:

Corey Hainey, Scale Manufacturing Association – There is a document containing their position on the website – carryover - SMA stated their stance in April. They are not in support of this item and recommend Withdrawn Status. They do not believe there is enough confusion to constitute a change.

The committee recommends Withdrawn status on this item.

Additional letters, presentations, and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents.

SCL-22.2 A UR.3.1.X. Required Minimum for Cannabis Products.

Source:
NCWM Cannabis Task Group

NOTE: The Scales Focus Group of the NCWM Cannabis Task Group modified the proposal in the fall of 2024 as represented below.

Purpose:
Establish uniform scale suitability requirements among the states for sales of cannabis.

Item Under Consideration:
Amend Handbook 44, Section 2.20. Scales Code as follows:

UR.3. Use Requirements.

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.
.

UR.3.1.X. Required Minimum Loads for *Cannabis* Products.

(a) The use of italicized text in the references to "*Cannabis*" is only to denote its proper taxonomic term; the italicized font does not designate a "nonretroactive" status as is the convention used throughout NIST Handbook 44.

(b) The recommended minimum loads specified in Table 8 shall be considered required minimum loads for scales used to weigh *Cannabis* and *Cannabis*-containing products.

(c) Scales used for commercial purposes to buy or sell all *Cannabis* products or the production of *Cannabis* products that have a total weight of 3 ounces or less shall be a Class II scale, be traceable to a National Type Evaluation Program Certificate of Conformance, and have a verification scale interval (e) of not greater than 0.01 g. A scale with a higher accuracy class than that specified as "typical" in Table 7a. Typical Class or Type of Device for Weighing Applications may be used.

(Added 20XX)

Previous Action:
2025: Assigned to the Cannabis Task Group
2024: Assigned to the Cannabis Task Group
2023: Assigned to the Cannabis Task Group
2022: Assigned to the Cannabis Task Group

Original Justification:
As states legalize sales of cannabis in its various forms, the need has arisen for uniform standards for scale suitability. Uniform requirements from one state to the next, will strengthen each jurisdiction's ability to effectively regulate the industry in a fair and equitable manner. Uniform standards also provide industry with expectations regardless of the jurisdiction, reducing potential conflict or confusion.

Some states may already have scale suitability requirements differing for those proposed here. The task group is hopeful that differences can be resolved so that the standards are the same in every jurisdiction:

The proposed suitability requirements are based on existing standards as set forth by the California Division of Standards, Division of Measurement Standards.

The submitter requested that this item be a Developing Item.

Comments in Favor:

Regulatory:
2025 Interim: Matt Douglas, California Division of Measurement Standards, recommended Assigned status.
2025 Interim: Kurt Floren, Los Angeles County CA, supports Assigned status for further development with NIST OWM and the Task Group working together. He pointed out that SCL-25.1 proposes to delete Table 8, which this item references. He also stated that it is astounding that NCWM still hasn't figured out appropriate scales.

Industry:
2025 Interim: Corey Hainy, Scale Manufacturers Association, supports Assigned status, and recommended removing part (b) or change the word "considered" to "the". The SMA provided detailed written comments for this item in the SMA Fall Positions.
2025 Interim: Dick Suiter, Richard Suiter Consulting, echoed Kurt Floren's comments about never answering the question of scale suitability in the past, although they've tried. He thinks it's time to do so and make the minimum loads required. He recommends Assigned status for this item due to the conflict with SCL-25.1.

Advisory:
2025 Annual: Robert Huff, Cannabis Task Group, commented that there was nothing new to report on the item.
2025 Interim: Evan Foisy, Cannabis Task Group, provided an update from the task group and requested Assigned status so that the Task Group can continue to develop the item with NIST OWM input to harmonize with SCL.25-1.
2025 Interim: Loren Minnich, NIST OWM, recommended Assigned status and stated that he would be happy to work with the Cannabis Task Group to develop these items. NIST OWM provided detailed written analysis for this item to the Committee.

Comments Against:

Regulatory:
2025 Interim: None

Industry:
2025 Interim: None

Advisory:
2025 Interim: None

Neutral Comments:

Regulatory:
2025 Interim: None

Industry:
2025 Interim: None

Advisory:
2025 Interim: None

Item Development:
NCWM 2025 Annual Meeting: The Committee looks forward to the continued development of the item. The Committee continues to encourage the task group to work with NIST OWM to ensure there is no future conflict with SCL-25.1 as updated by the Committee at the Annual Meeting.

NCWM 2025 Interim Meeting: The Committee encourages the task group to address the issues that have been raised and to work with NIST OWM to resolve the conflict with SCL-25.1 that was noted during open hearings. The item status remains Assigned.

NCWM 2024 Annual Meeting: The Committee updated the item under consideration based on changes received from the Cannabis Task Group. The new language proposes adding a user requirement for required minimum loads for cannabis products instead of modifying Table 7a and Table 8. The Committee removed UR.1.1. from the task group proposal, changed UR.3.1.X.(b) to retroactive, and clarified NTEP requirements in UR.3.1.X.(c).

NCWM 2024 Interim Meeting: The Committee updated the item to the latest version from the task group and the title to reflect the current item under consideration. The Committee has some concerns with the language “National Type Evaluation Program compliant” in the note being added to Table 8. The Committee also heard support during open hearings for a previous version of the item and concerns about the use of the terms "all cannabis" and “non-retail cannabis". The Committee has given this item an assigned status and requests the task group address the concerns that have been raised.

NCWM 2023 Annual Meeting: The committee heard from Charles Rutherford (Co-Chair of the task group) that they were waiting on the outcome of item SCL-23.3 before moving forward with this item.

NCWM 2023 Interim Meeting: The committee updated the item to include UR-3.1.2., as recommended by NEWMA. The committee has designated this item as assigned per recommendations from the submitters.

NCWM 2022 Annual Meeting: The Committee was given an update from Mr. Charles Rutherford, NCWM Cannabis Task Group Co-Chair. In his update, Mr. Rutherford requested that this item remain Assigned to the Task Group for further discussion. The Scales Focus Group will be regrouping, with Mr. Lou Sakin (Hopkinton, MA) as the Chair, for further development of the item. The Committee has agreed that this item will retain an Assigned status.

NCWM 2022 Interim Meeting: After hearing comments from the floor and referencing submitted supporting documents, the Committee has assigned this item back to the NCWM Cannabis Task Group for further development. The Task Group should consider the several proposals for alternate language that were provided by the regional associations. For more information or to provide comment, please contact:

Charles Rutherford, Chair
NCWM Cannabis Task Group
mailto:charlie@cprsquaredinc.com

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

During the WWMA 2025 Annual Conference the following comments were received:

Mr. Loren Minnich (NIST Office of Weights and Measures): This new item has a note that identifies the reason the word cannabis is italicized is it is the scientific name; he is not sure if the language is necessary. He suggested moving this to a note in the section being proposed.

Mr. Matthew Douglas (State of California, Division of Measurement Standards): Agreed with NIST, in moving the language from subsection A to a note. He also had questions about the intent regarding retroactive versus nonretroactive. He recommended that the item remain Assigned to the task group.

Mr. Kurt Floren (Los Angeles County, California): Questioned whether there is another version of this item that does not appear in the agenda. He stated that the scientific name of a plant must be italicized, and this explains why. He also pointed out that there is an item to delete Table 8. He stated that this gives guidance to the cannabis industry on what scale is suitable and this item accomplishes what the task group is intending.

Mr. Aaron Yanker (WWMA S&T Committee Chair): Clarified what is posted on the website is the most current version.

Mr. Loren Minnich (NIST Office of Weights and Measures): Stated during the NCWM Annual it was suggested that NIST OWM work with the Cannabis Task Group to make sure that the two items do not affect each other. They are moving away from that and trying to get Table 8 to be clearer. They felt that the values in the table were not large enough for cannabis. NIST did not think this was a viable option, because changing Table 8 would change it for all scales.

Mr. Cory Hainy (Representing the Scale Manufactures Association): SMA supports the continued development of this item.

Mr. Jason Flint (New Jersey): Asked if the new language was sent to all the other regions?

Mr. Aaron Yanker (WWMA S&T Committee Chair): Stated he would follow up, it is unknown currently.
The 2025 WWMA S&T Committee recommends that this item remain Assigned to the NCWM Cannabis Task Group and looks forward to further development by the NCWM Cannabis Task Group, with consideration to comments heard during Open Hearings.

CWMA 2025 Interim Meeting:

Loren Minnich – NIST OWM, commented that a more up to date version of this item was made available to the WWMA, with language including Class II scales and a minimum load of 100 e. Suggested that A should be a note and that B should have some language change. Further, that retroactivity should be included.

Greg VanderPlaats – MN, supports further development of this item, and agrees with the inclusion of 100 e.

Ivan Hankins – IA, agrees with MN, supports further development.

The Committee recommends this item remains Assigned based on comments made during open hearing.

NEWMA 2025 Interim Meeting:

Representative from NY – Subpart (c) – Would like clarity on use of "total weight" is this intended to mean net or gross weight.

Representative from NJ – New language for the proposal has been submitted and wanted to know if this was shared with NEWMA. Recommends the item stays assigned.

SWMA 2025 Annual Meeting:

The 2025 SWMA S&T Committee heard the following comments:

Mauricio Mejia, Florida – supports the item and recommends Voting status.

Alison Wilkinson, Maryland – Cannabis Task Group hasn't met in some time. Item has been in assigned status for a while. MD believes we need this scale suitability to move forward. Requests the group meet and replace lost members to allow this item to continue. Recommends Voting Status

Corey Hainey, SMA – supports the continued development of the item. Would like to remove Statement B – replace "considered" with "the"

Robert Huff, Delaware – Member of the Task Group – haven't met and is unsure who is the current chair. The task group was waiting on 25.1 (removing Table 8) to see how the changes would affect their work on this item. Recommends Voting Status.

The committee recommends Voting status on this item.

Additional letters, presentations, and data may have been submitted for consideration with this item. Please refer to www.ncwm.com/publication-15 to review these documents.

SCL-25.1 I S.5.2., S.6., and UR.3.1.

Source:
NIST Office of Weights and Measure

Purpose:
To amend Table 8 to reference d as the value for determining the recommended minimum load

Item under Consideration:
Amend Handbook 44 Scales Code as follows:

UR.3.1. Recommended Minimum Load. – A recommended minimum load is specified in Table 8. Recommended Minimum Load since the use of a device to weigh light loads is likely to result in relatively large errors.

Table 8. Recommended Minimum Load		
Class	**Value of Verification Scale ~~Division~~Interval (~~d or~~ e*)**	**Recommended Minimum Load (d ~~or e*~~)**
I	equal to or greater than 0.001 g	100
II	0.001 g to 0.05 g, inclusive	20
	equal to or greater than 0.1 g	50
III	All**	20
III L	All	50
IIII	All	10
*__The value of "e" is specified by the manufacturer as marked on the device (see Table S.6.3.a).__ For Class I and II devices equipped with auxiliary reading means (i.e., a rider, a vernier, or a least significant decimal differentiated by size, shape or color), the value of the verification scale ~~**division**~~**interval** "e" is the value of the scale division immediately preceding the auxiliary means. For Class III and IIII devices ~~**the value of "e" is specified by the manufacturer as marked on the device;**~~ "e" must be ~~**less than or**~~ equal to "d." **A minimum load of 10 d is recommended for a weight classifier marked in accordance with a statement identifying its use for special applications.		

(Amended 1990 **and 20XX**)

Previous Action:
2025: Informational

Original Justification:
UR.3.1. and Table 8 were adopted to reduce the error associated with rounding of the scale division (d).
Most scales are configured with e = d, this proposal has no effect on these devices.
Using d to determine the recommended minimum load is technically correct.

Comments in Favor:

Regulatory:
2025 Interim: Steve Timar, New York Department of Agriculture & Markets, voiced support of the intent of this item by removing Table 8 as a User Requirement and supports making minimum load requirements enforceable by placing them in the Specifications section of the handbook. He recommends a Developing status.
2025 Interim: Michelle McCulley, Maryland Department of Agriculture, supports removing the recommendations of minimum loads and voiced concerns that testing with loads smaller than the minimum recommended load could lead to confusion. She recommended an Informational status.
2025 Interim: Greg VanderPlaats, Minnesota Department of Weights and Measures, voiced support for removing the word "recommended" from minimum loads and cautioned that tolerances based on 'e' could be as large as 50% of the minimum load if the minimum load is based on 'd'. He further recommended changing the minimum capacity for Class II scales in Table S.5.2. from 20 to 50 and an Informational status.

Industry:
2025 Interim: Richard Suiter, Richard Suiter Consulting, commented that whether 'd' is used or not, if minimums are made into requirements, it would still be on the user to select the appropriate scale for the desired use.

Advisory:
2025 Annual: Loren Minnich, NIST OWM, provided an amended version of the item with "d" as the value used to figure the minimum load to limit rounding errors. He recommended moving the amended version forward as the item.
2025 Interim: Loren Minnich, NIST OWM, supported this item as Informational, stating this item makes a distinction between the minimum capacity and the minimum load, clarifies that the minimum capacity of the scale depends on the scale division, ties the minimum capacity to the classification, requires the minimum capacity to be marked on the scale, and that this proposal brings the Scales Code in line with OIML R 76.

Comments Against:

Regulatory:
2025 Interim: None

Industry:
2025 Annual: Corey Hainey representing the Scale Manufacturers Association stated that the SMA opposes the item as written. He stated that using "d" allows larger load and larger errors. He provided detailed written comments to the committee as well.
2025 Interim: Cory Hainy, SMA, spoke against the item as written, citing that using 'd' for a minimum capacity requirement allows a much smaller minimum load, resulting in a larger relative error. The marking requirement would also be burdensome on manufacturers, with limited benefit to the end user.
2025 Interim: Evan Foisy, A&D Engineering, spoke against the item as written, but generally supports the intent of the submitter. Comments made reflected previous comments regarding the error if 'd' was used, and that the minimum would be marked on the device if minimums were made requirements but not marked if the minimum load was left as a recommendation.

Advisory:
2025 Interim: None

Neutral Comments:

Regulatory:
2025 Annual: Matt Douglas, California Division of Measurement Standards, recommended the item remain Informational so that the comments heard during open hearings could be addressed and the item could be further developed.
2025 Interim: Steve Harrington, Oregon Department of Agriculture, stated that if the minimum load was made a marking requirement, then the minimum load itself would turn into a requirement. He recommended an Informational status.
2025 Interim: Matt Douglas, California Division of Measurement Standards, supports further development of this item to allow for changes based on comments heard.

Industry:
2025 Interim: None

Advisory:
2025 Interim: None

Item Development:
NCWM 2025 Annual Meeting: The Committee updated the item based on the recommendations from NIST OWM including amendments to the purpose, justification, and IUC, all of which have been implemented. The Committee is requesting further feedback on these changes.

NCWM 2025 Interim Meeting: The Committee retained the Informational status following the submitter's request and comments heard from the floor during the open hearing.

NCWM 2024 Annual Meeting: The Committee removed UR.3. Use Requirements, UR.3.1. Recommended Minimum Load, and Table 8 from SCL-23.3 to become a stand-alone item. During open hearings of SCL-23.3, the committee heard comments from 5 members of the Council in support of removing Table 8 from SCL-23.3 due to technical concerns expressed by NIST OWM in their analysis specifically the refence to e as the value for the recommended minimum load, instead of d, while other comments remained neutral. There were no comments objecting to the removal of Table 8. The committee would like to hear input from stakeholders to further develop the item.

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

During the WWMA 2025 Annual Conference the following comments were received:

Mr. Loren Minnich (NIST Office of Weights and Measures): Recommended that this table be updated to clarify that the determination for recommended load be based on the scale interval when a scale has an (e) not equal to (d), the recommended load is based on (e) right now. The table says to use (e) no matter what and that is confusing and technically incorrect. This will reduce rounding error, and its intended purpose is to reduce rounding errors with display of digital indication. The way that it is proposed now is the correct way.

Mr. Matthew Douglas (State of California, Division of Measurement Standards): He is generally supportive, however asked why the recommended minimum load would be based on (d) if the tolerances are based on (e)?

Mr. Loren Minnich (NIST Office of Weights and Measures): Clarified per the definition, tolerances are based on verification scale intervals and that Table 8 does not have to do with tolerance, just established suitable use of devices. He gave an example of a beam scale that is balanced between divisions, you can see where it's at but with a digital scale you cannot see that. You can see where it lands but not where it came from. This attempted to require a minimum load, so that rounding error does not have a significant effect on scale determination. That is why it is based on (d) and not (e).

Mr. Khoa Lam (Los Angeles County, California): Asked if this refers to Class I or II scales, where sometimes the last number is in a bracket, and we could see the (e) that was used to determine.

Mr. Loren Minnich (NIST Office of Weights and Measures): Stated that (d) value is the one in brackets, (e) is the one to the left of that.

Mr. Cory Hainy (Representing the Scale Manufactures Association): SMA opposes this item as written as it also poses a burden to the scale manufacturer.

The 2025 WWMA S&T Committee recommends that this item remain Informational. The Committee looks forward to further development of this item and encourages stakeholders to review and provide feedback to the submitter of this item.

CWMA 2025 Interim Meeting:

Loren Minnich – NIST OWM, commented that NIST provided a new version of this item to the NCWM S&T Committee which proposes changing Table 8 to clarify using "d" as recommended minimum load and keeping "e" in the middle column.

Greg VanderPlaats – MN, supports further development of this item, suggesting removing the word "Recommended" from the table title. Does not agree with using "d" for the minimum load column due to conflicts with applied tolerances. Recommend increases to minimum load values.

Ivan Hankins – IA, agrees with MN, supports further development.

The Committee recommends this item remain Informational to address comments made during open hearing.

NEWMA 2025 Interim Meeting:

Representative from NY – Supports the use of "d" when determining the recommended minimum load because this is technically correct. Recommends voting status.

SWMA 2025 Annual Meeting:

The 2025 SWMA S&T Committee heard the following comments:

Corey Hainey, SMA – opposes the item, as written. Using d as minimum capacity allows for smaller load, increasing error. This would put a burden on the manufacturer, with little to no benefit to consumers.

Mauricio Mejia, Florida – supports item as Voting.

The committee recommends Voting status on this item.

Additional letters, presentations, and data may have been submitted for consideration with this item. Please refer to www.ncwm.com/publication-15 to review these documents.

SCL-25.3 D UR.3.15. Zero-Balance Recorded Weight for Forklift Scales

Source:
Pennsylvania Bureau of Ride and Measurement Standards

Purpose:
Add a provision to the User Requirements for medium capacity forklift scales to record zero reading immediately prior to weighing.

Item under Consideration:
Amend the Handbook 44, Section 2.20. Scales Code and Appendix D as follows:

S.1.13. Vehicle On-Board Weighing Systems:

S.1.13.1. Vehicle in Motion. – When the vehicle is in motion, a vehicle on-board weighing system shall either:

(a) be accurate; or

(b) inhibit the weighing operation.

(Added 20XX)

S.1.13.2. Zero-Load Balance for Forklift Scales. - A forklift scale shall be capable of recording zero.
[Nonretroactive as of January 1, 20XX]
(Added 20XX)

(Added 1993) **(Amended 20XX)**

UR.3.15. Zero-Load Balance Recorded Weight for Forklift Scales – When a forklift scale is used in an indirect sale, zero shall be recorded prior to initiating the weighment.
[Nonretroactive as of January 1, 20XX]
(Added 20XX)

Add the following definitions to Appendix D:

Forklift Scale. - The vehicle on-board weighing system, typically on a pronged device, in the front of a vehicle used to lift and move materials over short distances. [2.20]

(Added 20XX)

Previous Status:
2025: Developing

Original Justification:
The Commonwealth of Pennsylvania is a major hub of commercial shipping throughout the Northeast and the United States. Commercial LTL shippers routinely conduct re-weighs on the products being shipped, often resulting in increased charges and fees to the consumer shipping the products from throughout the country and world. Over the last 30 years and especially over the last 15 years, the use of forklift scales in lieu of stationary floor scales has increased significantly. These re-weighs have no documentation of a zero-load balance preceding weighing, and the scales are subject to extensive wear on the shipping docks. In 2024, the 9-county region in South Central Pennsylvania inspected the forklift scales at 18 locations approving 566 and rejecting 249 and upon re-inspection of 211 forklift scales approved 162 and rejected 49, with the balance have been taken out of service. This was but one of the 7 regions in our state tracked in that period. Our Inspectors observed the forklifts traveling at significant speeds across the docks with pallets conducting undoubtedly individually hundreds of weighing's a day and noted on numerous occasions when inspecting those scales, they not to be in zero-load balance. Many of the units do not have active displays, most with the weights being transmitted directly to a master database system without the operator observing the weight, effectively operating blindly. Additionally, we have noted an increasing growth in the number of complaints regarding increased charges, even when the shipper weighed the commodity on state-inspected and certified scales. We were advised by one customer that the shipper would only entertain a challenge to the re-weigh if they had a photograph of their shipment on a state certified scale with the bill of laden for that shipment in the photo. Having taken into advisement of all the suggestions and guidance to the original proposal, the Commonwealth of Pennsylvania continues to feel that this revised proposal should proceed and so that the recording of a zero-load balance preceding to the weighing providing equity in the transaction to all parties involved.

The added requirement of recording the zero-load balance prior to weighing would add a minimal encumbrance to the shipper's efficiency, by requiring the user to record zero immediately before each weighing. It should be noted that most of the systems they record on should already be capable of recording the zero-load balance immediately prior and provide traceability to the weighing process.

Comments in Favor:

Regulatory:
2025 Interim: The submitter of this item John Dillabough, Pennsylvania Bureau of Ride and Measurement Standards, requested this item be assigned a Developing status to address issues with the item that were identified in the regional meetings.

Industry:
2025 Interim: None

Advisory:
2025 Interim: None

Comments Against:

Regulatory:
2025 Interim: None

Industry:
2025 Interim: Cory Hainy, SMA, stated that recording '0' will not prevent the scale from being out of tolerance and that this item is too vague.

Advisory:
2025 Interim: None

Neutral Comments:

Regulatory:
2025 Interim: Steve Harrington, Oregon Department of Agriculture, stated that this item does not sound like a User Requirement item, but more like a Specifications item. He recommended a Developing status.
2025 Interim: Matt Douglas, California Division of Measurement Standards, agreed with the suggestion that the submitter work with the Uniform Shipping Law Task Group. He recommended a Developing status.

Industry:
2025 Interim: None

Advisory:
2025 Interim: Jan Konijnenburg, NIST OWM, stated this item could be interpreted as extending the requirement to apply to all on-board weighing systems which may have unforeseen consequences. It was also noted that this item, as a specification, will have a significant impact on the certification of on-board weighing systems. NIST OWM recommends that the submitter should consider working with the NCWM Uniform Shipping Law Task Group to coordinate efforts.

Item Development:
NCWM 2025 Annual Meeting: No comments were heard during the Annual Meeting.

After the Annual Meeting, the submitter requested updates to the Item Under Consideration and the Original Justification. The Committee has amended the item to include those updates.

NCWM 2025 Interim Meeting: The Committee has set the status of this item to Developing following the submitter's request and comments heard from the floor during the open hearing. The Committee recommends the submitter address concerns raised during open hearings.

Contact: John Dillabaugh
jkdillabaugh@gmail.com

Regional Associations' Comments:

WWMA 2025 Annual Meeting: During the WWMA 2025 Annual Conference the following comments were received:

Mr. Cory Hainy (Representing the Scale Manufactures Association): SMA opposes this item, recording 0 will not solve a scale being out of tolerance and "immediately prior" is too vague

Mr. Matthew Douglas (State of California, Division of Measurement Standards): Recommended that this remains Developing to get feedback from stakeholders.

The 2025 WWMA S&T Committee recommends that this item be assigned a Withdrawal status.
The Committee encourages the submitter to work with the NCWM L&R Uniform Shipment Law Task Group to accomplish the intent of this item. The Committee also feels this item, as currently written, does not resolve the issue presented in the justification.

CWMA 2025 Interim Meeting:

Greg VanderPlaats – MN, supports further development of this item, the word "record" in Line 22 Page 29 of the agenda implies that all forklift scales would require ticket printers.

Richard Suiter – Richard Suiter Consulting, commented that the term "recording" now also refers to electronic recording and not necessarily a physical printed ticket.

Loren Minnich – NIST OWM, echoes the comments of Richard Suiter. A "recording" could mean a physical ticket or a digitally recorded representation in the background.

The Committee recommends this item remain Developing to address comments made during open hearing.

NEWMA 2025 Interim Meeting:

Retired representative from PA – The proposal has been workshopped and revised by expanding the Specification and user requirements and he now recommends voting status.

Representative from NJ – The proposal has merit and also recommends voting status.

Representative from NH – Recommends voting status.

Representative from NY – Recommends voting status.

SWMA 2025 Annual Meeting:

The 2025 SWMA S&T Committee heard the following comments:

Corey Hainey, SMA – opposes item. Recording zero won't solve balance being out of tolerance. In addition, the term "immediately prior" is too vague.

The committee recommends Developing status on this item.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents.

LMD – LIQUID MEASURING DEVICES

LMD-24.2 I N.4.1. Normal Tests.

NOTE: This item was introduced through the Northeastern Weights and Measures Association.

Source:
New Hampshire Department of Agriculture, Markets, and Food

Purpose:
Provide clarity to 3.30. Liquid—Measuring Devices, N.4.1. Normal Tests.

Item under Consideration:
Amend Handbook 44, Section 3.30. Liquid Measuring Devices Code as follows:

N.4.1. Normal Tests. – The "normal" test of a device shall be made at the maximum discharge flow rate developed under the conditions of installation. Any ~~**additional**~~ test~~s~~ conducted at **the maximum discharge flow rate developed under the conditions of installation** ~~**flow rates**~~ down to and including one-half of the sum of the maximum discharge flow rate ~~**(MDFR)**~~ **developed under the conditions of installation** and the rated minimum discharge flow rate

~~(RMDFR)~~ shall be considered **a** normal test**~~s~~**. **~~As a formula, this is stated as~~To determine the minimum flow rate at or above which a "normal" test is conducted, the following equation is provided**:

$$\frac{(\textbf{\textit{MDFR}}\textit{maximum discharge flow rate} + \textbf{\textit{RMDFR}}\textit{rated minimum discharge flow rate})}{2} = \textit{minimum discharge flow rate for additional tests}$$

Where:

The maximum discharge flow rate is the maximum rate of flow developed under the conditions of installation.

The rated minimum discharge flow rate is the marked minimum discharge rate or the minimum flow rate specified by the manufacturer.

At a minimum, one "normal" test shall be conducted on each meter at the maximum discharge flow rate developed under the conditions of installation.

(Amended 1991**, ~~and~~** 2023**, and 20XX**)

Previous Status:
2025: Informational
2024: Developing

Original Justification:
The existing code requirement is very wordy and difficult to understand without an example and a formula. This proposal adds an example and formula that will give clarity to N.4.1. Normal Tests.

The additional language will be one of several other NIST HB 44 codes that give clarifying examples.

NIST has indicated that in the near future the handbooks will not be printed but will be digitally produced. Therefore, we are no longer constrained by the size of the handbook if the information adds value.

The problem can be resolved through more thorough training. We were informed that a formula can be added, however, an example will make the handbook longer and it sets a precedence for adding examples in the future.

The submitter requested Voting status in 2024.

Comments in Favor:

Regulatory:
2025 Annual: Matt Douglas, California Division of Measurement Standards, commented that he supports Informational status and noted that there may be other codes that require similar language.
2025 Interim: Cheryl Ayer, New Hampshire Department of Agriculture, Markets, & Food, as the submitter of the item, requests a Voting status with the updated language provided by NIST OWM. Currently, in New Hampshire, registered service agents are performing the tests on behalf of the state and this language will help clarify a normal test.
2025 Interim: Matthew Curran, Florida Department of Agriculture & Consumer Services, recommended a Developing or Informational status so that the updated language presented during open hearings can be vetted through the regional associations to gather more input. He doesn't agree with adding examples in the handbooks and thinks examples would be better served in an EPO or other guidance document that is not part of a regulation.
2025 Interim: Scott Wagner, Colorado Division of Oil and Public Safety, supports a Developing status. He recognizes the formula in the 2025 edition of NIST Handbook 44 needs corrected but does not support the example in the item. He recommends the item be vetted through the regional associations.
2025 Interim: Alison Wilkinson, Maryland Department of Agriculture, supports a Developing status. She agreed with the previous comments from Florida and Colorado. She also recommended the formula in the existing code be corrected.

2025 Interim: Steven Harrington, Oregon Department of Agriculture, Weights and Measures Program, supports a Developing status. He commented that he appreciates the use of examples that add clarity.
2025 Interim: Jose Arriaga, Orange County CA Weights & Measures, supports a Developing status to allow the regions to provide feedback.
2025 Interim: Matthew Douglas, California Division of Measurement Standards, supports a Voting status with the language recommended by the WWMA. He recommended a Developing status for all other versions. He is opposed to the example and stated that the last sentence in the updated version presented during open hearings is unnecessary. He noted further that the VTM code may also need similar updates.

Industry:
2025 Annual: Dimitri Karimov, Meter Manufacturers Association, commented that he appreciates the changes that have been made to the item and supports it moving forward.
2025 Annual: Brent Price, Gilbarco, commented that he supports the item.
2025 Interim: Brent Price, Gilbarco Inc, supports a Developing or Informational status. He agrees with the previous comments from Florida and Maryland and recommends the item be vetted through the regional associations.
2025 Interim: Dmitri Karimov, Advanced Flow Solutions, Inc d/b/a Liquid Controls, supports a Developing status. He thinks the item is almost there.

Advisory:
2025 Interim: Loren Minnich, NIST OWM, recommended a Voting status with the updated language suggested in NIST OWM's Detailed Analysis. This suggested language was developed to emphasize that it is the maximum discharge flow rate developed under the conditions of installation along with the rated minimum discharge flow rate that is used in the calculation "To determine the minimum flow rate at or above which a "normal" test is conducted. This new language also amends the formula, which is now part of the paragraph, replacing the acronyms with the terms "maximum discharge flow rate" and "rated minimum discharge flow rate" and provides a description of these terms. In addition, there is a statement that specifies "At a minimum, one "normal" test shall be conducted on each meter at the maximum discharge flow rate developed under the conditions of installation". The language OWM has proposed is intended to provide clarification in regard to how the normal test is conducted but does not change the application of the paragraph.

Comments Against:

Regulatory:
2025 Interim: None

Industry:
2025 Interim: None

Advisory:
2025 Interim: None

Neutral Comments:

Regulatory:
2025 Interim: None

Industry:
2025 Interim: None

Advisory:
2025 Interim: None

Item Development:
NCWM 2025 Annual Meeting: The Committee heard support for the updated language in the item under consideration and is requesting additional feedback from stakeholders.

NCWM 2025 Interim Meeting: The Committee received comments opposing the example and in favor of keeping the equation with correction to the formula. The Committee updated the item to the language developed by the submitter and NIST OWM. The item has been assigned an Informational status to allow the new language to be reviewed by the regions and further development.

NCWM 2024 Annual Meeting: The committee recommends that the submitter works with NIST OWM to harmonize the item under consideration with what currently appears in NIST Handbook 44.

NCWM 2024 Interim Meeting: The committee notes that the item under consideration is inconsistent with 2024 edition of Handbook 44 language and encourages the submitter to work with NIST OWM to harmonize the differences and address the concerns raised during open hearings. The committee has assigned a developing status for this item.

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

During the WWMA 2025 Annual Conference the following comments were received:

Mr. Matthew Douglas (State of California, Division of Measurement Standards): Curious if other sections might benefit from this language and supports Voting status.

The 2025 WWMA S&T Committee recommends a Voting status. The committee believes the item is fully developed and ready for a vote.

CWMA 2025 Interim Meeting:

Loren Minnich – NIST OWM, commented that NIST's analysis of this item has not changed, believes it is fully developed, and supports voting status.

The Committee recommends this item be given a Voting status based on comments heard during open hearing.

NEWMA 2025 Interim Meeting:

Representative from NH – Trying to add clarity to determining what is a normal test. NIST advised to change this code first then change other codes.

Representative from NJ – Recommends voting status.

Representative from NY – Questions if the definition of "Normal Test" could be changed, and an example be provided.

Representative from VT – Questioned the word "developed" means as used, and proposes it would be clearer to use a "percentage of the maximum flow rate as installed" instead of the current equation.

SWMA 2025 Annual Meeting:

The 2025 SWMA S&T Committee heard the following comments:
Alison Wilkinson, Maryland – Proposal causes confusion with example formula. Recommendation is to remove formula and move forward with just the wording. It was intended to be added as editorial but believes the formula doesn't belong in handbook. Remove formula and move forward with voting.

The committee recommends Voting status on this item with editorial changes.

or above which a "normal" test is conducted~~, the following equation is provided~~:

~~$$\frac{(MDFR_{maximum\ discharge\ flow\ rate} + RMDFR_{rated\ minimum\ discharge\ flow\ rate})}{2} = minimum\ discharge\ flow\ rate\ for\ additional\ tests$$~~

Where:

Additional letters, presentations, and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents.

LMD-26.1 S.2. Measuring Elements, S.4. Marking Requirements, N.4. Testing Procedures, U.R.6. ~~Temperature~~ Volume Compensation and Correction Wholesale, and T.5. Density Correction Systems.

Source:
American Petroleum Institute

Purpose:
Clarify the acceptable use of specific density correction methods that allow for the accurate determination of volume growth that occurs when gasoline is blended with ethanol to make a finished motor fuel.

Item under Consideration:
Amend NIST Handbook 44 Liquid Measuring Devices Code as follows:

S.2. Measuring Elements

…

S.2.9. Wholesale Devices Equipped with Electronic Automatic Density-Correction Systems.

S.2.9.1. Automatic Density Correction. – If a device is equipped with an automatic means for adjusting the indication and registration of measured volume of product to correct for the expansion of volume when blending separately metered components to create a new product with altered properties.

(a) Wholesale device must also be equipped with an electronic Automatic Temperature-Compensating System; and

(b) An automatic means to determine and correct for changes in product density shall be incorporated in the system:

(1) automatic means to accept, calculate, or measure a density of the finished product; or

(2) automatic means to accept, calculate, or measure a density and volume of each base component.

S.2.9.2. Provision for Deactivating. – On a device equipped with an automatic density-correction system, provision shall be made for deactivating the automatic density correction so that the meter can indicate and record in terms of the uncorrected volume.

S.2.9.3. Provision for Sealing Automatic Density Correction System. – Provision shall be made for applying security seals for a densimeter in such a manner that no adjustment may be made to the system without breaking the seal.
(Added 202X)
Nonretroactive

…

S.4 Marking Requirements

…

S.4.3. Wholesale Devices.

…

S.4.3.3. Automatic Density Correction for Changes in Product Composition. – If a device is displaying density-corrected volumes, then the volumes must be labeled clearly and conspicuously on the primary indicating elements, recording elements, and recorded representation that the adjustment has been made.
(Added 202X)
Nonretroactive

…

N.4. Testing Procedures

…

N.4.1.2. Wholesale Devices Equipped with Automatic Density Correction. – On wholesale devices equipped with automatic density correction for changes in product composition, normal tests shall be conducted by comparing the density corrected volume as indicated by the device to the actual delivered volume corrected by a reference implementation.

The first test shall be performed with the automatic density-correction system operating in the "as found" condition.

On devices that indicate or record the density-corrected volume, temperature-compensated volume, and uncompensated volume for each delivery, the tests in N.4.1.1.(a), N.4.1.1.(b), and N.4.1.2., may be performed as a single test.
(Added 202X)
Nonretroactive

…

T. Tolerances

T.4. Automatic Temperature-Compensating Systems. *– The difference between the meter errors (expressed as a percentage) determined with and without the automatic temperature-compensating system activated shall not exceed:*

(a) 0.2 % for mechanical automatic temperature-compensating systems; and

(b) 0.1 % for electronic automatic temperature-compensating systems.

The delivered quantities for each test shall be approximately the same size. The results of each test shall be within the applicable acceptance or maintenance tolerance.
[Nonretroactive as of January 1, 1988]
(Added 1987) (Amended 1992, 1996, and 2002)

T.5. Density Compensation Systems. - The error between the calculated net standard volume and the volume as determined in a reference implementation shall not exceed 0.1% for nonautomatic or automatic density-correction system for the total delivered volume.

The delivered quantities for each test shall be approximately the same size. The results of each test shall be within the applicable acceptance or maintenance tolerance.
[Nonretroactive as if January 1, 202X]
(Added 202X)

…

UR.3.6. ~~Temperature~~ Volume Compensation and Correction, Wholesale

UR.3.6.1. Automatic.

UR.3.6.1.1. When to be Used. – If a device is equipped with a mechanical automatic temperature compensator, it shall be connected, operable, and in use at all times. An electronic or mechanical automatic temperature-compensating system may not be removed, nor may a compensated device be replaced with an uncompensated device, without the written approval of the responsible weights and measures jurisdiction.

Note: This requirement does not specify the method of sale for product measured through a meter. (Amended 1989)

UR.3.6.1.2. Invoices.

(a) A written invoice based on a reading of a device that is equipped with an automatic temperature compensator shall show the net volume delivered and that the volume delivered has been adjusted to the volume at 15 °C (60 °F).

(b) The invoice issued from an electronic wholesale device equipped with an automatic temperature-compensating system shall also indicate for **each metered component or the finished product:**

(1) the API gravity, specific gravity, or coefficient of expansion ~~for the product~~;

(2) ~~**product**~~ temperature**(s)**; and

(3) gross reading.

(c) The invoice issued from a wholesale system equipped with an automatic density correction system, in addition to the requirements in (b) above, shall indicate:

(1) excess volume for the finished product; and

(2) the net standard volume inclusive of the excess volume.

Note: Shall include the statement, "Volume delivered has been adjusted to the volume at 15 °C (60 °F) and for changes in density."
Nonretroactive
(Added 202X)

UR.3.6.2. Nonautomatic.

UR.3.6.2.1. Temperature Determination. – If the volume of the product delivered is adjusted to the volume at 15 °C (60 °F), the product temperature shall be taken during the delivery in:

(a) the liquid chamber of the meter; or

(b) the meter inlet or discharge line adjacent to the meter; or

(c) the compartment of the receiving vehicle at the time it is loaded.

UR.3.6.2.2. Density Determination. – If the volume of the product delivered is adjusted for changes in the density of the finished product, then the product density shall be measured, or the product density at base conditions shall be determined by industry accepted practices and applied in the calculation via analysis of each of the base components.
Nonretroactive
(Added 202X)

UR.3.6.2.3. Invoices. The accompanying invoice for a nonautomatic density corrected finished product shall indicate that the volume of the product has been adjusted for temperature variations to a volume at 15 °C (60 °F). Further the invoice shall also indicate for each metered component or the finished product:

(1) the API gravity, specific gravity, or coefficient of expansion;

(2) temperature(s);

(3) gross reading;

(4) excess volume for the finished product; and

(5) the net standard volume inclusive of the excess volume.

Note: Shall include the statement, "Volume delivered has been adjusted to the volume at 15 °C (60 °F) and for changes in density".
Nonretroactive
(Added 202X)

Previous Status:
New Proposal

Original Justification:
The volume of gasoline and ethanol when blended is more than the volume of the two liquids measured separately. Due to the way terminal load racks are configured, some measure the blended product using the custody meter and therefore capture the volume gain at the custody transfer meter (side stream blending), while others use multiple custody transfer meters to measure the gasoline and ethanol components separately (ratio blending) and do not capture the volume gain. The proposed changes will codify that a calculation can be applied at the Ratio-Blend terminal such that the two terminals have a comparable PTD.

The difference in terminal operations can cause inequity between the two types of terminals. The solution is for terminals that don't directly measure the volume growth in the final blended product to apply an industry standard (API Chapter 11.3.4) that calculates that volume expansion. Correcting the volume for this growth is known as Density Correction. The calculation used for density correction would use the same API gravities used by the automatic temperature compensation system to calculate the net volume of the gasoline-ethanol blend at 60^{O}F.

Variable	Temperature Compensation (GST)	Density Correction (Net Volume)
Reference Density of Gasoline (BOB) in API gravity units	✓ (API MPMS 11.1)	✓ (API MPMS 11.1)
Reference Density of Ethanol in API gravity units	✓ (API MPMS 11.3.3)	✓ (API MPMS 11.3.3)
Gross Meter Readings	✓ (API MPMS 12.2)	✓ (API MPMS 12.2)
Product Temperature (load average)	✓ (API MPMS 7.4)	✓ (API MPMS 7.4)
Net Meter Readings for ethanol and BOB	*(output from Temp Comp)*	
Ideal Fraction Ethanol (i.e., ethanol blend percentage)		✓ (API MPMS 11.3.4)

The proposed changes to Handbook 44 identify the sections that should be updated to codify the use of the API standard without replumbing the terminal. [Note there is also a separate but related proposal to change Handbook 130, Method of Sale.]

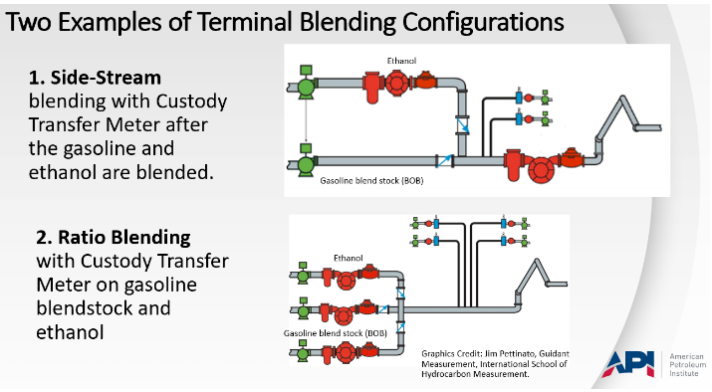
The proposed changes to HB 44 are the result of nine task force meetings where the group reviewed the science of the expanded volume, raised and discussed concerns, and discussed the proposed language incorporated in this proposal. The task force was led by API with participation from five states, NIST staff, retailer representatives, meter manufacturers, terminal operators, ethanol representatives, and consultants.

Background:

When gasoline and ethanol are blended the volume of the finished fuel increases by about 0.2% (range 0.08% to 0.4%) that is dependent on the density of the gasoline blend stock and the percentage of ethanol blended into the finished gasoline-ethanol fuel.

Some terminal configurations capture the volume expansion in the overall net calculation, while others do not, resulting in an inequity between the two configurations. To understand the inequity at the terminals, it is helpful to consider two of the terminal configurations that blend gasoline and ethanol (e.g., 10% ethanol, 15% ethanol, 85% ethanol). For simplicity, when we refer to a fuel it will be E10 as that fuel is more than 95% of the consumed gasoline in the U.S.

The first configuration is a **Side-Stream terminal.** It measures the ethanol which is then added to the gasoline blend stock ahead of the custody transfer meter. This configuration captures the volume growth that takes place when the net volume of the blended product is calculated.



The second is a **Ratio-Blending terminal.** The ethanol is measured through a custody transfer meter and the gasoline blend stock is measured through a separate custody transfer meter. The two components are blended in the terminal piping or in the tank truck where the volume growth takes place. Since the component net volumes are calculated separately, the volume growth of the blended product is not captured.

In a Ratio-Blending terminal a calculation can be applied using the process identified in API MPMS Ch. 11.3.4. that corrects for the change in the density of the combined products and the additional volume gain that will occur.

Additional questions and answers:

Q1. If the API standard is used at a Ratio-Blending Terminal, how does an inspector prove that the density correction has been appropriately applied?

A1. An inspector would use a process similar to proving a terminal with an automatic temperature compensation system. The EPO No. 25, Loading Rack Meters, would be updated.

Q2. What are the Density Correction System requirements?

A2. API believes that HB 44 allows for a system to correct for a density shift in a gasoline-ethanol blend and recognizes that some NTEP devices are currently approved for that use. However, to ensure that the use of this correction is clearly permissible, we identify language in Handbook 44 that would be clarifying for devices that provide density correction algorithms per API standards.

A metering system uses the same data to determine the excess volume as it uses for the correction for temperature (the reference density, the meter gross volume reading and the live temperature measurement). The device then will apply the density of the finished product or of the base components (e.g., gasoline or ethanol) to determine the correction for excess volume. The BOB reference density is typically quite stable. Only the observed (live) density varies from batch to batch, depending on temperature. As such a density correction system can accept, calculate, or measure the density of the finished product or of each base component (i.e., gasoline or ethanol) using these inputs. This would apply to HB 44 Section 3.30 Liquid Measuring Devices paragraphs S.2.9., S.4., N.4., UR.3.6.1., and T.5.

Q3. How is the density of the gasoline blend stock measured?

A3. Terminals measure the density (as an API Gravity) of gasoline in the aboveground storage tank by using a handheld density meter, an in-tank densitometer, or sending it to the lab. The sample that is tested using the handheld device or the

lab uses the procedures identified in API MPMS Ch. 8 which details how to grab a sample from the bottom, middle, and top of tank. The API Gravity of the gasoline blend stock must be brought to a reference temperature of 60ºF or 15ºC.

The API gravity is entered into the terminal automation system either manually or through a connected system. The API Gravity, corrected to 60ºF of the individual products (i.e., BOB) does not change between the tank and the meter.

Q4. How is the API Gravity of ethanol determined?

A4. Ethanol is a single-molecule fuel that is denatured with 2-5% petroleum fuel. The small percentage of denaturant does not meaningfully affect the API Gravity of the ethanol between batches. Thus when calculating denatured ethanol net volumes, for any ethanol with 1 to 5% denaturant (regardless of whether the denaturant is natural gasoline or gasoline), the calculation should use API Table 6C with an alpha coefficient of 0.000603 ºF or use API Table 6B with 50.61 ºAPI.

API MPMS Chapter 11.3.3, paragraph 4.2 Denatured 95 % to 99 % Fuel Ethanol

> For volume or density correction from observed temperature to 60 °F, the implementation procedure given in API MPMS Ch. 11.1-2004 shall be used for ethanol denatured with 1 % to 5 % by volume of either natural gasoline or gasoline (Annex B). Such denatured ethanol is classified a "special application" (formerly known as Table 6C or Table 54C) with an alpha coefficient of 0.000603 °F or 0.001085 °C (Annex C). For more information on denaturant choice, see Annex B. For more information on the applicability of these alpha coefficients to other denaturants, see Annex C and Annex D.

Q5: With the possibility of the density of the BOB changing each time the terminal receives a batch from the pipeline, and given that the density impacts the calculated net temperature correction and the density correction, is the density traceable within the terminal metering system? If not when new density values are entered, should they be traceable and verifiable?

A5: The answer to both questions is, yes. Some, if not all systems have an audit log, and if it is properly configured, it will log the changes to the reference density. Each system will be different, but as an example, an inspector could look at the log to see the old densities that were entered. To determine if the system is properly configured, an inspector could perhaps change the reference density value temporarily to determine if it is properly logged in the system.

Q6. What is the relationship between specific gravity and API gravity of a fuel?

A6. According to Pennsylvania State University, "Density is defined as mass per unit volume of a fluid. The density of crude oil and liquid hydrocarbons is usually reported in terms of specific gravity (SG) or relative density, defined as the density of the liquid material at 60°F (15.6°C) divided by the density of liquid water at 60°F. At a reference temperature of 15.6°C, the density of liquid water is 0.999 g/cm^3 (999 kg/m^3), which is equivalent to 8.337 lb/gal (U.S.). Therefore, for a hydrocarbon or a petroleum fraction, the SG is defined as:

$$\text{SG } (60^{O}\text{F}/60^{O}\text{F}) = (\text{Density of liquid at } 60^{O}\text{F in g/cm3})/(0.999\text{g/cm3})"$$

In the early years of the petroleum industry, the American Petroleum Institute (API) adopted the API gravity (°API) as a measure of the crude oil density. The API gravity is calculated from the following equation:

$$API = 141.5/(SG15.6\,°C/15.6°C) - 131.5$$

Source: https://www.e-education.psu.edu/fsc432/content/api-gravity

Q7. At what temperature should API gravity be observed?

A. API gravity and specific gravity must always be observed at 60^{O}F or 15^{O}C.

Q8. How will an invoice or product transfer document (PTD) be affected?

A8. The major requirement would be that the invoice/PTD reflects either the metered components or the finished product. All the appropriate information to provide a transparent invoice would be included on the invoice/PTD for an Automatic Density Correction system and Nonautomatic system. Specifically, it would include API gravity, temperature, gross readings, excess volume, and the net volume including the calculated growth. A statement would be required stating, "Volume delivered has been adjusted to the volume at 15 °C (60 °F) and for changes in density".

Q9. What API standards are used in a terminal to ensure an accurate measurement?

A9. There are at least 12 different API Manual of Petroleum Measurement Standards (MPMS) that form the basis of an accurate measurement at a terminal.[3]

- Ch. 8.1 Manual Sampling of Petroleum Products (ASTM D4057)
- Ch. 5.x Metering (5.1 General Considerations for Measurement by Meters, with specific chapters that address for displacement meters, turbine meters, Coriolis meters, ultrasonic flow meters, Fidelity and Security of Flow Measurement Pulsed-Data Transmissions Systems)
- Ch. 6.x – Metering Systems (6.1 Metering Assemblies- General Considerations, with specific chapters for - Truck and Rail Loading and Unloading Measurement Systems; - Pipeline and Marine Loading/Unloading Measurement Systems; and Lease Automatic Custody Transfer Systems)
- Ch. 4.x Proving Systems (Displacement Provers, Master-Meter Provers, Field Standard Test Measures, Methods of Calibration for Displacement and Volumetric Tank Provers, Part 1—Introduction to the Determination of the Volume of Displacement and Tank Provers)
- Ch. 7.4 Dynamic Temperature Measurement
- Ch. 11 Physical Properties Data (ASTM D1250, Adjunct)
    - Chapter 11.1 - Temperature and Pressure Volume Correction Factors for Generalized Crude Oils, Refined Products, and Lubricating Oils
    - Ch. 11.3.3 Miscellaneous Hydrocarbon Product Properties—Denatured Ethanol Density and Volume Correction Factors
    - Ch. 11.3.4 Miscellaneous Hydrocarbon Properties - Denatured Ethanol and Gasoline Component Blend Densities and Volume Correction Factors
    - Ch. 11.4.1 Density of Water and Water Volumetric Correction Factors for Water Calibration of Volumetric Provers
- Ch. 12.2 Calculation of Petroleum Quantities using Dynamic Measurement Methods and Volumetric Correction Factors
- Ch. 21.2 Electronic Liquid Measurement Using Positive Displacement and Turbine Meters

Q10. How are API standards used in terminals today?

A10. Terminals require the implementation of multiple API standards including all the standards identified in A9 above to ensure there is an accurate and transparent measurement for the customer receiving the product into the tank and the customer receiving the product from the terminal into a tank truck for delivery to a retail gasoline station. Further, sales

[3] https://www.api.org/-/media/files/publications/2024-catalog/2024-publication-catalog.pdf.

agreements may state that where temperature compensation is used, those calculations incorporate the methods and procedures specified in API MPMS Chapter 11.

Q11. How is an automatic temperature compensation system proven today?

A11. Regulators may use spreadsheets, lookup tables or commercial software to compare the calculated temperature compensated volume to the net volume that is printed on the Bill of Lading, Invoice or on the ticket from the terminal system.

Q12. How would an inspector prove the calculated volume expansion at a terminal?

A12. The volume expansion that occurs due to physical chemistry can be proven in the same manner as an automatic temperature compensation system that calculates the net volume of gasoline. The volume expansion that occurs when the components are blended can be demonstrated using a spreadsheet, look-up table or commercial software. Additionally, the Examination Procedure Outline (EPO) No. 25 for Loading Rack Meters would be updated to incorporate the appropriate procedures.

Q13. Is there a specific API standard that should be used to calculate the volume expansion?

A13. Yes. API MPMS Ch. 11.3.4 which is a subchapter of Ch. 11.1 should be used. The volume change calculated using Ch. 11.3.4 is needed to reconcile the fact that the volume of gasoline and ethanol when blended is slightly greater than the volume of the two liquids measured separately. In equation form,

$$\text{Gasoline BOB}_{\text{(net volume)}} + \text{Ethanol}_{\text{(net volume)}} \neq \text{Gasoline-Ethanol Blend}_{\text{(net volume)}}$$

Q14. In the context of NCWM, why should the API standards be accepted?

A.14. Handbook 130, Uniform Weights and Measures Law, Section 16, recognizes "firmly established trade custom and practice" that dictate how liquid fuels are sold. Specifically, it states,

> **Section 16. Method of Sale**
>
> Except as otherwise provided by the Director or by firmly established trade custom and practice,
>
> (a) commodities in liquid form shall be sold by liquid measure or by weight; and
>
> (b) commodities not in liquid form shall be sold by weight, by measure, or by count.
>
> The method of sale shall provide accurate and adequate quantity information that permits the buyer to make price and quantity comparisons.
>
> (Amended 1989)

In 2024, the U.S. customers consumed 137 billion gallons of gasoline (most of which was 10% ethanol) and 63 billion gallons of diesel fuel. Another 24 billion gallons of jet fuel were consumed in the U.S. At each stage of the process from producing the crude oil to selling the finished fuel to a retail gasoline station the product is measured. So, while there is over 224 billion gallons of finished product consumed in the U.S., those molecules have likely been measured many times over. These measurements are so important that the API Committee on Petroleum Measurement (COPM) meets twice a year, with over 700 people in attendance, at each meeting to review the standards that are used in the U.S. and around the world. By definition, the petroleum industry uses the API standards which are firmly established trade custom and practice.

- **Possible Opposing Arguments:** Demonstrate that you are aware and have considered possible opposition.

Some have suggested that the terminal should be replumbed to allow the finished fuel to flow through a custody meter. However, this is often not possible due to the footprint and design of the terminal. Regardless, it should not be required as there is accurate technology available and approved NTEP equipment already available.

Some have raised concerns that metering systems should not modify the volume of the product after it has gone through the custody meter. This concern appears to be premised on the belief that the gross volume **and** the net volume are measured. In practice, the only measured volume is the gross volume and that is measured by counting pulses from the meter in accordance with an API standard. The gross volume is then used by the custody transfer system or the automatic terminal management system to calculate the net volume using another set of API standards including Chapters 5.x, 6x, 7.4, 11.1, 11.3.3, 11.3.4, 12.2, and 21.2. Please see above for the names of these standards.

Some have shared concerns that only standards approved by NCWM or by NIST and referenced in the Handbooks or in Publications can be used to determine volumes. As stated in the previous paragraph, this is simply not possible. None of the API standards that are needed to calculate the temperature corrected volume of fuels is listed in the NIST/NCWM publications or Handbooks. With this logic, it would be impossible to determine the net volume of fuels and other chemicals.

The submitter requested Voting status in 2026.

Comments in Favor:

Regulatory:
-

Industry:
-

Advisory:
-

Comments Against:

Regulatory:
-

Industry:
-

Advisory:
-

Neutral Comments:

Regulatory:
-

Industry:
-

Advisory:
-

Item Development:
[Explain any changes made to the original proposal and committee recommendations]

Regional Associations' Comments:

WWMA 2025 Annual Meeting:
During the WWMA 2025 Annual Conference the following comments were received:

Mr. Matthew Shein (Chevron): Handbook 144 was the original intention on density correction, believes the item can move forward on its own, LNR remains important, presented a 10 minute slideshow, temperature compensation is done appropriately, and has been calculated through calibration, blended molecules do not stack well, add statements to NIST HB 44 to calculate density with information that has already been collected, submitted a form 15, goal of voting in January of 2026.

Mr. Rusty Lewis (Marathon): Was part of the work group and requests the item be Voting.

Mr. Matthew Douglas (State of California, Division of Measurement Standards): Supports a Voting status.

Mr. Mahesh Albuquerque (Colorado Division of Oil & Public Safety): Questions if the expansions are over tolerance but supports Voting status.

Mr. Matthew Shein (Chevron): Admits that tolerance could be over the expansion.

Mr. Steve Benjamin (API Consulting): States expansion happens in transit; expansion cannot occur twice.

Mr. Matthew Shein (Chevron): Supports Voting status.

The 2025 WWMA S&T Committee recommends a Voting status. The committee believes this item is fully developed and ready for a vote.

CWMA 2025 Interim Meeting:

Prentiss Searles – API, gave a presentation in support of this item.
Steve Carter – IL, gave a presentation in opposition of this item.

Steve Carter – IL, recommends withdrawal of this item, commenting that billing should not be based off estimates.
Andrew Montanye – NE, recommends withdrawal of this item, commenting that this has not been vetted and questions why a meter can't be used to measure the blended product.
Marcus Belshe – MO, recommends withdrawal of this item, and suggests that a meter be used to measure the blended product.

Chuck Corr – CC Consulting, states that this is not fully developed nor ready for a vote. Questions the variability of the calculation due to the unpredictability of the blending process, and questions if this could be applied to, and impact, many different products. Suggests that a meter be used to measure the blended product. Written comments were also provided and available on the CWMA site.

Ivan Hankins – IA, supports further development or withdrawal. Suggests that a meter be used to measure the blended product.

Greg VanderPlaats – MN, commented that this would not apply in MN, since they do not allow temperature or other compensation. Recommends that some terms being used be defined, such as "reference", "excess volume", "net standard volume", "industry accepted practices", and "base condition." Suggests the solution is to use a meter to directly measure the blended product.

The Committee recommends this item be given a Developing Status based on comments received during open hearing.

NEWMA 2025 Interim Meeting:

Representative from API – Gave a presentation on the science and reasons this proposal is warranted. Recommends voting status. Responded to the Representative from NJ that "densimeter" is the best term. The presentation is available on the NEWMA website.

Representative from NY – Questions whether there should be a UR disallowing Density Corrections for side stream blending since the custody meter already accounts for the volume growth. Recommends developing status.

Representative from NJ – "Densimeter" should it be that word or not. Should this be defined in Appendix D. In UR.3.6 the word "temperature" should be kept when adding "volume" and "correction". Suggested keeping temperature in the title and adding a separate line requirement for volume correction. Recommends developing status.

Representative from Marathon Petroleum – Supports this proposal.

Representative from Growth Energy – No position but has question about implementation for blending and retailers.

The committee recommends a developing status for this item.

SWMA 2025 Annual Meeting:

The 2025 SWMA S&T Committee heard the following comments:

Prentiss Searles, American Petroleum Institute– Presentation – Fact Sheet Handout – looking at density correction for gasoline-ethanol blend stating it is necessary at certain terminals to provide equitable comparison of fuel volumes. A technician – using software - you can test and grab variables and calculate – let spreadsheet do the math Not an actual device being recommended – more a practice – using temperature probes already in place and software. Doing a net calculation, take variables and input to find temperature compensated volumes.

Software did go through NTEP approved for Guidant. Software was approved for density correction. Recommends voting status.

Jason Glass, Kentucky – Presented a question; while not arguing the science he is curious how to look at meters/provers and questions if this has shown up to be an error often.

Prentiss Searles, API– answers, issue initiated in Illinois – a bill of lading didn't identify how additional gallons "got there". This proposal can add language to the bill of lading, net and "new" gallons, to better understand how it comes together. There is an L&R recommendation that accompanies this proposal.

Tory Brewer, West Virginia – Presented a question. Is this a new device or more a software in S.2.9.3. Are inspectors to be looking for an actual seal or an audit log?

Prentiss Searles, API – Confirms it is not a device and may not need the section regarding sealing. Software must be sealable and auditable (per other sections) so that is why it was included.

Mauricio Mejia, Florida – What is the impact of the 0.2 % ? This could be very impactful economically – comparing that value to the cost to replace the pipes at the terminal.

Prentiss Searles, API– He doesn't have a specific cost, the terminal may not have the ability to have the additional meters installed due to lack of real estate.

Michael Keilty, Endress+Hauser – There is no NTEP test procedure but there is a policy added. In recent discussions, because there is no reference in HB44, they removed that policy. No device has been tested for this mechanism. It is simply an adjustment factor in the existing device – not compared at each individual location. Number of companies that have this type of ratio blending system is approx. 20, nationwide per Jim Pettinato. Diagram of testing system and asked about the timing, given that it takes time for the readjustment. What happens when ethanol is added to just before

the custody meter – blend must happen significantly upstream. If it isn't blended at time of testing, this changes how it would be applied. How would a WM official know which system is eligible for this density correction? How will the mechanism be tested for type approval?

Prentiss Searles, API – To clarify, density is calculated each time you get a new batch at the terminal and is not a fixed correction. Density of the blend stock side stream takes 6 feet to completely blend the product.

Michael Keilty, Endress+Hauser – The correction value is not "behind the seal" and would require a readjustment each delivery. What are the limits of adjustability?

Prentiss Searles, API – It is not being adjusted, density is measured for net also and comes as each batch of new fuel comes into the terminal. When they receive a batch they have a grab sample from bottom, middle and top checking for density.

Alison Wilkinson, Maryland – reading the proposal is misleading that it is portrayed as a device and not a software. She would like to see the software submitted as a system with an NTEP approved meter for evaluation and receive a certificate of conformance as a whole system. If it goes into the handbook, as written, it leads to confusion for inspectors. They'll be looking for a device. Using software in confusion with already approved devices (temperature probe). Recommends Withdrawn or Developing, as it isn't ready for handbook.

Russell Lewis, Marathon Petroleum – Regarding comments to if it is a device or not – devices are in place – a study in 2019 was done to create 11.3.4 – it went through D0202 ASTM – as a peer review during that study gathering roughly 6,000 data points and then pared down to under 2,000 to meet the criteria for test conditions. 11.3.4 is cited in an ASTM document. The difference is getting factors off existing factors – applying a formula from that 2019 study (spreadsheet or software). Using temperature corrections and density already – this is an additional step based on different hydrocarbon densities. Work Group had state regulators and NIST who collectively came up with this language. There have been suggestions for consideration, but the item doesn't change the technical approach. In support of this being a Voting Item

Alison Wilkinson, S&T Committee – Software vs charts . Inquired whether to use the correction factors for density with software or by hand using charts.

Russel Lewis, Marathon Petroleum– Answered previous question that it could be both. The working group decided these were the parts of the HB that needed to be addressed (it is also affecting HB130 with L&R)

Matt Sheehan, Chevron –in support of Prentiss' and Russ' comments. They prefer to use this calculation. In support of this item.

Jared Scott, Exxon – in support of this item. Believes this is a way to ensure fair and equitable trade. We want accuracy, both as a consumer and business.

Alison Wilkinson, Maryland – Proposal uses existing technology with addition of correction factors – feels this proposal is misleading the way it's currently written. Recommends Developing for further development, for clarification.

The committee recommends Developing status on this item.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents

HGV – HYDROCARBON GAS VAPOR-MEASURING DEVICES

HGV-25.1 D S.1.1.4. Advancement of Indicating and Recording Elements., S.11.5. Proving Indicator., S.2.2. Provision for Sealing., S.4.3. Temperature Compensation.,

S.4.4. ~~Badge~~Identification., N.3. Test Drafts., N.4.1. Normal Tests., and Appendix D. Definitions register

Source:
California Department of Food and Agriculture – Division of Measurement Standards

Purpose:
The proposed changes are to recognize new technologies in hydrocarbon gas vapor-measuring devices.

Item under Consideration:
Amend the Handbook 44 Hydrocarbon Gas Vapor-Measuring Devices Code as follows:

NOTE: This item was modified for 2026 by the developer. Changes are highlighted.

S.1.1.4. Advancement of Indicating and Recording Elements. – Primary indicating and recording elements ~~**shall advance digitally or continuously and be susceptible to advancement only by the mechanical operation of the device.**~~ **shall advance only by the designed operation of the device.**

(Amended 20XX)

S.1.1.5. Proving Indicator. – **All Hydrocarbon Gas Vapor-Measuring Devices shall be equipped with a proving indicator as described below or an indication which satisfies the resolution requirements identified below applicable to a proving indicator.**

(a) For mechanical (analog) proving indicators the following applies:

(1) Devices rated less than 280 m3/h (10 000 ft3/h) gas capacity shall be equipped with a proving indicator measuring 0.025 m3, 0.05 m3, 0.1 m3, 0.2 m3, or 0.25 m3 per revolution, (1 ft3, 2 ft3, 5 ft3, or 10 ft3 per revolution) for testing the meter. ~~**Devices with larger capacities shall be equipped as follows:**~~

~~(a)~~(2) Devices rated 280 m3 (10 000 ft3) up to but not including 1700 m3/h (60 000 ft3/h) gas capacity shall be equipped with a proving indicator measuring not greater than 1 m3 (100 ft3) per revolution.

~~(b)~~(3) Devices rated 1700 m3/h (60 000 ft3/h) gas capacity or more shall be equipped with a proving indicator measuring not more than 10 m3 (1000 ft3) per revolution.

~~**The t**~~**T**est circle ~~**of the**~~ proving indicator**s** shall be divided into ten equal parts. Additional subdivisions of one or more of such equal parts may be made.

(b) For electronic (digital) proving indications, the smallest unit of volume displayed shall be no larger than 1/1000 of the value of the smallest unit of indicated delivery required in S.1.1.3. Value of Smallest Unit. The meter shall be capable of displaying the proving indication continuously while testing the meter.

(Amended 1973**,** ~~and~~ 1988**, and 20XX**)

…

S.2.2. Provision for Sealing. – For devices or systems in which the configuration or calibration parameters can be changed by use of a removable digital storage device, security shall be provided for those parameters as specified in G-S.8.2. Devices and Systems Adjusted Using Removable Digital Storage Devices. For parameters adjusted using other means, the following applies.

~~**Adequate provision shall be made for applying security seals in such a manner that no adjustment or interchange can be made of any measurement element.**~~

Adequate provision shall be made for an approved means of security (e.g., data change audit trail) or for physically applying a security seal in such a manner that requires the security seal to be broken before an adjustment or interchange can be made of:

(a) any measuring or indicating element;

(b) any adjustable element for controlling delivery rate when such rate tends to affect the accuracy of deliveries; and

(c) any metrological parameter that will affect the metrological integrity of the device or system.

When applicable, the adjusting mechanism shall be readily accessible for purposes of affixing a security seal.

Audit trails shall use the format set forth in Table S.2.2. Categories of Device and Methods of Sealing.*

[*Nonretroactive as of January 1, 20XX]

(Amended 2019**, and 20XX**)

Table S.2.2. ***Categories of Device and Methods of Sealing***	
Categories of Device	***Method of Sealing***
Category 1: No remote configuration capability.	***Seal by physical seal or two event counters: one for calibration parameters and one for configuration parameters.***
Category 2: Remote configuration capability, but access is controlled by physical hardware. The device shall clearly indicate that it is in the remote configuration mode and record such message if capable of printing in this mode or shall not operate while in this mode.	***The hardware enabling access for remote communication must be on-site. The hardware must be sealed using a physical seal or an event counter for calibration parameters and an event counter for configuration parameters. The event counters may be located either at the individual measuring device or at the system controller; however, an adequate number of counters must be provided to monitor the calibration and configuration parameters of the individual devices at a location. If the counters are located in the system controller rather than at the individual device, means must be provided to generate a hard copy of the information through an on-site device.***
Category 3: Remote configuration capability access may be unlimited or controlled through a software switch (e.g., password). The device shall clearly indicate that it is in the remote configuration mode and record such message if capable of printing in this mode or shall not operate while in this mode.	***An event logger is required in the device; it must include an event counter (000 to 999), the parameter ID, the date and time of the change, and the new value of the parameter. A printed copy of the information must be available on demand through the device or through another on-site device. The information may also be available electronically. The event logger shall have a capacity to retain records equal to 10 times the number of sealable parameters in the device, but not more than 1000 records are required. (Note: Does not require 1000 changes to be stored for each parameter.)***

[Nonretroactive as of January 1, 20XX]

(Table Added 20XX)

S.2.5. Adjustments and Corrections for Measuring Elements and Measuring Systems. – Other than devices with mechanical meters, Hydrocarbon Gas Vapor-Measuring Devices shall be equipped with automatic means to determine and correct for changes in the product's properties or variations in other parameters having a significant metrological effect that results in a measured quantity in excess of allowable error limits when compared with the delivered quantity. The device shall provide a means to identify when these features are not operating properly.

[Nonretroactive as of January 1, 20XX]
(Added 202X)

S.4. Marking Requirements. - In addition to all the marking requirements of Section 1.10. General Code, paragraph G-S.1. Identification, each Hydrocarbon Gas Vapor-Measuring Device shall have the following information conspicuously, legibly, and permanently marked:

(Amended 20XX)

S.4.1. Limitations of Use. – If a device is intended to measure accurately only products 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 device.

S.4.2. Discharge Rates. – ~~**A device shall be marked to show it's**~~ **The** rated gas capacity in cubic meters per hour or cubic feet per hour~~.~~ **for the particular products that the device was designed to meter as identified by the manufacturer.**

(Amended 20XX)

S.4.3. Temperature Compensation. – If a device is equipped with an automatic temperature compensator, this shall be **marked on the front of the** ~~**indicated on the badge or immediately adjacent to the badge of the**~~ device**. If the device is equipped with a removable indicating and/or recording element, this information shall also appear** ~~and~~ on the ~~**register**~~ **indicating/recording element**.

(Amended 20XX)

~~**S.4.4. Badge.** – A badge affixed in a prominent position on the front of the device shall show the manufacturer's name, serial number and model number of the device, and capacity rate of the device for the particular products that it was designed to meter as recommended by the manufacturer.~~

…

N.3. Test Drafts. – Except for low-flame tests, test drafts shall be at least equal to**:**

(a) For devices equipped with a mechanical indicating and/or recording elements:

(1) Meters equipped with test circles - one complete revolution of the largest capacity proving indicator and shall in no case be less than 0.05 m3 or 2 ft3.

(2) Meters not equipped with test circles - ten times the smallest proving indicator division and shall in no case be less than 0.05 m3 or 2 ft3.

(b) For devices equipped with an electronic register - at least ten times the smallest proving indicator division and in no case less than 0.05 m^3 or 2 ft^3.

All flow rates shall be controlled by suitable outlet orifices.

(Amended 1973**,** ~~and~~ 1991 **and 20XX**)

…

N.4.1. Normal Tests. – The normal test of a device shall be made at a rate not to exceed the capacity rate ~~given on the badge~~ **marked on** ~~of~~ the meter.

(Amended 1988**, and 20XX**)

…

N.4.2.4. Leak Test. – The device shall be tested for leaks up to a pressure not to exceed the manufacturer's maximum rated pressure. The device shall not leak. Meters which are not intended to be leak tested by submersion under water are to be leak tested as described on the type approval certificate.

(Added 20XX)

…

UR.1.1. Customer Indicating Element, Accessibility. – For systems in which the primary indicating element is not reasonably accessible to the customer, one of the following shall be provided.

(a) Console display which is accessible to the customer on which the customer can clearly identify and then select the device's reading information,

(b) A remote display which is provided to the customer as part of the system, or

(c) At the option of the customer, an application that provides readings in real time. [Nonretroactive as of January 1, 20XX]

(Added 20XX)

UR.2.4.6. Tenant Premise Identification. – Tenant premise identification shall be clearly and permanently shown on or at the device, and on all separate components of a device. Remote indications and all recorded indications shall be readily identifiable and readily associated with the customer's premises. Recorded indications shall also include time and date information.

[Nonretroactive as of January 1, 20XX]

(Added 20XX)

…

NIST HB 44 – Appendix D. Definitions

~~**badge. A metal plate affixed to the meter by the manufacturer showing the manufacturer's name, serial number and model number of the meter, and its rated capacity. [3.33]**~~

Comments in Favor:

Regulatory:
2025 Annual: Matt Douglas, California Division of Measurement Standards, commented that he received feedback from NIST OWM that he plans to incorporate into the item. He hopes revised language will be available by the Interim Meeting, if not by the fall regional meetings. He is also requesting additional feedback.
2025 Interim: Matthew Douglas, California Division of Measurement Standards, as submitter of the item, requests a Developing status to get additional feedback and technical assistance. This item is intended to address new technologies in the meters. He referenced his comments from the Western Weights and Measures Association S&T Committee 2024 annual report. He also clarified S.1.1.4. as referenced in NIST OWM's analysis is in congruence with water meter codes.

Industry:
2025 Interim: None

Advisory:

2025 Interim: Loren Minich, NIST OWM, supports a Developing status. NIST OWM will evaluate other requirements in this section to ensure they adequately address newer technologies. This may require additional paragraphs, such as the new paragraphs suggested in the NIST OWM Detailed Technical Analysis, or amendment of existing paragraphs.

Comments Against:

Regulatory:
2025 Interim: None

Industry:
2025 Interim: None

Advisory:
2025 Interim: None

Neutral Comments:

Regulatory:
2025 Interim: None

Industry:
2025 Interim: None

Advisory:
2025 Interim: None

Item Development:
NCWM 2025 Annual Meeting: The Committee looks forward to revisions for this item and encourages stakeholders to provide additional feedback to the submitter.

NCWM 2025 Interim Meeting: The Committee added the original justification to the item and assigned a Developing status based on comments heard during Open Hearings. The Committee encourages the submitter to continue developing the item in collaboration with NIST OWM and other stakeholders.

Contact: Matthew Douglas
matthew.douglas@cdfa.ca.gov

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

During the WWMA 2025 Annual Conference the following comments were received:

Mr. Matthew Douglas (State of California, Division of Measurement Standards): Submitter of the item, worked with NIST to develop this item, this is the first time he has introduced an item with substantial changes, supports a voting status, font changes S&T page 50 lines 7-9 and 20: larger font is an error.

The 2025 WWMA S&T Committee recommends this item remain Developing. The committee encourages the submitter to seek feedback from stakeholders and allow NIST OWM time to review the changes made by the submitter.

The committee recognizes the submitter's intention to highlight changes to the item; however, the committee encourages the submitter to consider proper editorial notations and remove the highlighted sections from the proposed item.

CWMA 2025 Interim Meeting:

Hearing no comments, the Committee recommends this item be given a Voting status.

NEWMA 2025 Interim Meeting:

No comments. No recommendation.

SWMA 2025 Annual Meeting:

No comments were heard

The committee has no recommended status for this item.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents.

WTR – WATER METERS CODE

WTR-26.2 S.1.1.4. Advancement of Indicating and Recording Elements.

Source:
NIST Office of Weights and Measures

Purpose:
Clarify that a meter shall advance only by the designed operation of the device in accordance with General Code requirements, specifically G-S.3. Permanence.

Item under Consideration:
Amend NIST Handbook 44 Water Meters Code as follows:

> **S.1.1.4. - Advancement of Indicating and Recording Elements.** – Primary indicating and recording elements shall advance only by the designed operation of the device~~**, as intended by the manufacturer**~~. (Amended 2021 **and 20XX**)

Previous Status:
New Proposal

Original Justification:
The phrase “as intended by the manufacturer” may be interpreted as allowing a device to be designed to operate in a manner that is contrary to the principles of NIST Handbook 44. By removing this phrase, this implication is removed. While manufacturers may intend to make a device that complies with the parameters of NIST Handbook 44, there are times when, inadvertently, a device is developed that does not comply.

It should be recognized that very few jurisdictions evaluate or regulate water meters. In this context, this paragraph has been in the handbook since 2021, and no concerns have been raised since then.

The submitter requested Voting Status.

Comments in Favor:

Regulatory:
-

Industry:
-

Advisory:
-

Comments Against:

Regulatory:
-

Industry:
-

Advisory:
-

Neutral Comments:

Regulatory:
-

Industry:
-

Advisory:
-

Item Development:
New Proposal

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

During the WWMA 2025 Annual Conference the following comments were received:

Mr. Loren Minnich (NIST Office of Weights and Measures): This item removes the term as intended by the manufacture and is editorial change. The item is ready for a vote.

Mr. Matthew Douglas (State of California, Division of Measurement Standards): Supports Voting status.

The 2025 WWMA S&T Committee recommends a Voting status. The committee believes the item is fully developed and ready for a vote.

CWMA 2025 Interim Meeting:

Loren Minnich – NIST OWM, commented that the language has been amended to incorporate meters with no mechanical parts, which was a necessary change and now better reflects the intent of the item. Supports as voting.

The Committee recommends this item be given a Voting status based on comments received during open hearing.

NEWMA 2025 Interim Meeting:

No comments. No recommendation.

SWMA 2025 Annual Meeting:

No comments were heard

The committee has no recommended status for this item.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents

EVF – ELECTRIC VEHICLE FUELING SYSTEMS

EVF-26.2 3.40 Electric Vehicle Fueling System A.2. Exemptions, S.1 Primary Indicating and Recording Element, S.1.2. EVSE Indication Elements, S.1.3.2 EVSE Values of Smallest Units, S.2.3. EVSE Provision for Power Loss, S.2.4.2. Equipment Capacity and Type of Voltage, S.2.4.4. Agreement Between Indications, S.2.5.1. Money-Value Divisions Digital, S.7 Totalizer for EVSE Systems, N.3.2. Type Evaluation of a DC EVSE

Source:
Vermont Division of Food Safety & Consumer Protection Weights and Measures

Purpose:
The intent of the proposed changes is to add clarity, uniformity, and consistency to NIST Handbook 44, Section 3.40. Electric Fueling Systems. The proposal adds language and removes exemptions, which will be beneficial to compliance programs, consumers, and the EVSE industry.

Item under Consideration:
Amend NIST Handbook 44 Electric Vehicle Fueling Systems Code as follows:

A.1. General. – This code applies to devices, accessories, and systems used for the measurement of electricity dispensed in vehicle fuel applications wherein a quantity determination or statement of measure is used wholly or partially as a basis for sale or upon which a charge for service is based.

A.2. Exceptions. – This code does not apply to:

The use of any measure or measuring device owned, maintained, and **only used to charge equipment owned by that** public utility or municipality **operating in a public utility system and** only in connection with measuring electricity subject to the authority having jurisdiction such as the Public Utilities Commission.

~~Electric Vehicle Supply Equipment (EVSEs) used solely for dispensing electrical energy in connection with operations in which the amount dispensed does not affect customer charges or compensation.~~

The wholesale delivery of electricity.

A.3. Additional Code Requirements. – In addition to the requirements of this code, Electric Fueling Systems shall meet the requirements of Section 1.10. General Code.

A.3.1. Electric Vehicle Supply Equipment (EVSE) with Integral Time-Measuring Devices. – An EVSE that is used for both the sale of electricity as vehicle fuel and used to measure time during which services (e.g., vehicle parking) are received. These devices shall also meet the requirements of Section 5.55. Timing Devices.

A.4. Type Evaluation. – The National Type Evaluation Program (NTEP) will accept for type evaluation only those EVSEs that comply with all requirements of this code and have received safety certification by a nationally recognized testing laboratory (NRTL).

S. SPECIFICATIONS

S.1. Primary Indicating and Recording Elements.

S.1.X. General. – Electric Vehicle Supply Equipment (EVSE).

shall be equipped with a primary indicating element as part of the device; and

may be equipped with a primary recording element

[Nonretroactive as of January 1, 2027]

S.1.1. Electric Vehicle Supply Equipment (EVSE). – An EVSE used to charge electric vehicles shall be of the computing type and shall indicate the electrical energy, the unit price, and the total price of each transaction.

EVSEs capable of applying multiple unit prices over the course of a single transaction shall also be capable of indicating the start and stop time, the total quantity of energy delivered, the unit price, and the total price for the quantity of energy delivered during each discrete phase corresponding to one of the multiple unit prices.

(b) EVSEs capable of applying additional fees for time-based and other services shall also be capable of indicating the total time measured; the unit price(s) for the additional time-based service(s); the total computed price(s) for the time measured; and the total transaction price, including the total price for the energy and all additional fees.

S.1.2. EVSE Indicating Elements. – An EVSE used to charge electric vehicles shall include an indicating element that accumulates continuously and can display~~**, for a minimum of 15 seconds at the activation by the user and at the start and end of**~~ **the required information throughout the transaction at the consumers request. Following the completion of a charge and transaction, the correct measurement results relative to quantity, unit price, total price, and any other fees shall be displayed for a minimum of 1 minute following the charger being unplugged from the vehicle.** Indications shall be clear, definite, accurate, and easily read under normal conditions of operation of the device. All indications and representations of electricity sold shall be clearly identified and separate from other time-based fees indicated by an EVSE that is used for both the sale of electricity as vehicle fuel and the sale of other separate time-based services (e.g., vehicle parking).

S.1.2.1. Multiple EVSEs Associated with a Single Indicating Element. – A system with a single indicating element for two or more EVSEs shall be provided with means to display information from the individual EVSE(s) selected or displayed, and shall be provided with an automatic means to indicate clearly and definitely which EVSE is associated with the displayed information.

S.1.3. EVSE Units.

S.1.3.1. EVSE Units of Measurement. – EVSE units used to charge electric vehicles shall be indicated and recorded in kilowatt-hours (kWh) and decimal subdivisions thereof.

(Amended 2022)

S.1.3.2. EVSE Value of Smallest Unit. – The value of the smallest unit of indicated delivery by an EVSE, and recorded delivery ~~**if the EVSE is equipped to record**~~**:**

~~**for AC systems shall not exceed 0.0001 kWh;**~~

~~**for DC systems**~~ shall not exceed 0.001 kW and kWh; and

the value of the kWh shall be expressed only as a decimal submultiple of 1 ~~**that satisfy (a) and (b).**~~ (Amended 2022)

S.1.3.3. Values Defined. – Indicated values shall be adequately defined by a sufficient number of figures, words, symbols, or combinations thereof. An indication of "zero" shall be a zero digit for all displayed digits to the right of the decimal mark and at least one to the left.

S.2. EVSE Operating Requirements.

S.2.1. EVSE Return to Zero.

The primary indicating and the primary recording elements of an EVSE used to charge electric vehicles, if the EVSE is equipped to record, shall be provided with a means for readily returning the indication to zero either automatically or manually.

It shall not be possible to return primary indicating elements, or primary recording elements, beyond the correct zero position.

S.2.2. EVSE Indicator Zero Reset Mechanism. – The reset mechanism for the indicating element of an EVSE used to charge electric vehicles shall not be operable during a transaction. Once the zeroing operation has begun, it shall not be possible to indicate a value other than: the latest measurement; "all zeros;" blank the indication; or provide other indications that cannot be interpreted as a measurement during the zeroing operation.

S.2.3. EVSE Provision for Power <u>or Network</u> Loss.

S.2.3.1. Transaction Information. – In the event of a power loss <u>or network loss</u>, the information needed to complete any transaction (i.e., delivery is complete and payment is settled) in progress at the time of the power loss (such as the quantity and unit price, or sales price) shall be determinable through one of the means listed below or the transaction shall be terminated without any charge for the electrical energy transfer to the vehicle:

at the EVSE;

at the console, if the console is accessible to the customer;

via on site internet access; or

through toll-free phone access.

For EVSEs in parking areas where vehicles are commonly left for extended periods, the information needed to complete any transaction in progress at the time of the power loss shall be determinable through one of the above means for at least eight hours.

S.2.3.2. Transaction Termination. – In the event of a power loss <u>or network loss</u>, either:

(a) the transaction shall terminate at the time of the power loss <u>or network loss</u>; or

(b) the EVSE may continue charging without additional authorization if the EVSE is able to determine it is connected to the same vehicle before and after the supply power outage.

In either case, there must be a clear indication on the receipt provided to the customer of the interruption, including the date and time of the interruption along with other information required under S.2.6. EVSE Recorded Representations.

S.2.3.3. User Information. – The EVSE memory, or equipment on the network supporting the EVSE, shall retain information on the quantity of fuel dispensed and the sales price totals during power loss.

S.2.4. EVSE Indication of Unit Price and Equipment Capacity and Type of Voltage.

S.2.4.1. Unit Price. – An EVSE shall be able to indicate on each face the unit price at which the EVSE is set to compute or to dispense at any point in time during a transaction.

S.2.4.2. Equipment Capacity and Type of Voltage. – An EVSE **and any app used to advertise, or activate, or both shall ~~be able to~~** conspicuously indicate **~~on each face~~** the maximum rate of energy transfer **possible and the maximum rate of energy transfer currently** available (i.e., maximum power) and the type of current associated with each unit price offered (e.g., 7 kW AC, 25 kW DC, etc.).

S.2.4.3. Selection of Unit Price. – When electrical energy is offered for sale at more than one unit price through an EVSE, the selection of the unit price shall be made prior to delivery through a deliberate action of the purchaser to select the unit price for the fuel delivery. Except when the conditions for variable price structure have been approved by the customer prior to the sale, a system shall not permit a change to the unit price during delivery of electrical energy.

Note: When electrical energy is offered at more than one unit price, selection of the unit price may be through the deliberate action of the purchaser: 1) using controls on the EVSE; 2) through the purchaser's use of personal or vehicle-mounted electronic equipment communicating with the system; or 3) verbal instructions by the customer.

S.2.4.4. Agreement Between Indications. – All quantity, unit price, and total price indications within a measuring and billing system shall agree for each transaction.

S.2.5. EVSE Money-Value Computations. – An EVSE shall compute the total sales price at any single-purchase unit price for which the electrical energy being measured is offered for sale at any delivery possible within either the measurement range of the EVSE or the range of the computing elements, whichever is less.

S.2.5.1. Money-Value Divisions Digital. – An EVSE with digital indications shall comply with the requirements of paragraph G-S.5.5. Money-Values, Mathematical Agreement, and the total price computation at the end of the transaction shall be based on **~~quantities not exceeding 0.01 kWh~~ the minimum value of the smallest unit as defined in S.1.3.2.**

(Amended 2023)

S.2.5.2. Auxiliary Elements. – If a system is equipped with auxiliary indications, all indicated money value and quantity divisions of the auxiliary element shall be identical to those of the primary element.

…

S.7. Totalizers for EVSE Systems. – EVSE systems shall be designed with a nonresettable totalizer for the quantity delivered through each separate measuring device. Totalizer information shall be adequately protected and unalterable. The system shall provide totalizer information and readily available on the face of the device ~~site or via on site internet access~~.

…

N.3. Test of an EVSE System. – The testing methodology compares the total energy delivered in a transaction and the total cost charged as displayed/reported by the EVSE with that measured by the measurement standard. Each test shall be performed for at least the minimum measured quantity (MMQ).

N.3.1. Testing of an AC EVSE. – Accuracy tests shall be performed at the following current levels:

A point between 4 A and 10 A;

A point between 40 % and 60 % of the MDA; and

A point between 70 % and 100 % of the MDA.

(Amended 2024)

~~**N.3.2. Type Evaluation Testing of a DC EVSE. Tests shall be performed at the following voltage points one between 350 VDC and 450 VDC and if supported by the EVSE a second at between 700 VDC and 900 VDC:**~~

~~**Accuracy tests shall be performed at the following current levels:**~~

~~**A point between 10 % and 20 % of the MDA, but not less than 30 A;**~~

~~**A point between 40 % and 60 % of the MDA; and**~~

~~**A point between 70 % and 100 % of the MDA.**~~
~~**(Amended 2024)**~~

N.3.3. ~~Performance Verification in the Field~~ Testing of a DC EVSE. – Accuracy tests shall be performed at any voltage and the following current levels:

A point between 10 % and 20 % of the MDA, but not less than 30 A; and

A point between 25 % and 100 % of the MDA, with the recommendation to test at the maximum power level within that range that is possible using the test load and test standard available.

Note: The test points (a) and (b) above must not be at the same current level. It is recommended that the current levels should be separated to the extent that the test load and test standard will allow.

For DC systems it is anticipated that an electric vehicle may be used as the test load. Under that circumstance, testing at the load presented by the vehicle shall be sufficient for field verification provided that it is greater than 40 % of the MDA and no less than 30 A.

All DC EVSE placed into service prior to January 1, 2025 are exempt from this requirement until January 1, 2028.
(Amended 2022 and 2024)

N.4. Repeatability Tests. – Tests for repeatability shall include a minimum of three consecutive tests at the same load, similar time period, etc., and be conducted under conditions where variations in factors are reduced to minimize the effect on the results obtained.

Previous Status:
New Proposal

Original Justification:

The EVSE industry, consumers, and regulators can benefit from increased clarity, uniformity, and consistent expectations. These proposed changes will enhance consumer confidence, leading to increased use and support of the electric vehicle charging network. Many consumers desire more clarity and understanding when using EVSEs. As one consumer stated, “using EVSE should be the same experience as using a gas pump.”

Several of the proposed changes clarify legally ambiguous and inconsistent statements within the Electric Vehicle Fueling Systems code. As weights and measures compliance programs are implemented around the country, it is crucial to establish clear standards where everyone agrees on the meaning of each requirement. Standards that are unclear, confusing or susceptible to multiple interpretations promote misunderstanding and a lack of confidence in the industry and enforcement programs. One manufacturer might be trying to comply with interpretation “y,” while another operates under assumption “x,” and compliance jurisdictions take actions based on interpretation “z.” This last type of misunderstanding leads to added costs to manufacturers and installers, as well as wastes time of compliance programs.

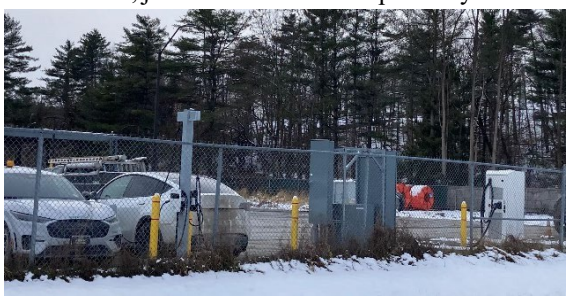
A.2. Exemptions (a)

In Vermont, public utilities own between 15% and 20% of EVSEs commercially available to the public and in direct competition with EVSEs owned by the government and other private companies. This exemption, as is currently written, creates varying standards within the industry. To ensure uniformity, all commercial EVSEs available to the public should comply with a single standard. Therefore, EVSEs owned by public utilities and accessible to the public should not be exempt from these regulations, as they are in direct competition with those EVSEs that are subject to these requirements.

The word "used" is ambiguous and lends itself to multiple interpretations. "Used" could mean the person who plugs in to charge their personal vehicle, but it could also mean the entity who is "using" the EVSE to sell power, or both. The added language aims to provide a clear interpretation of this exemption.

Public utilities and private companies should be permitted to own and operate EVSEs for internal use and which are not open to the public, without having to comply with Handbook 44 requirements for these chargers. Example 1 shows a set of EVSEs inside a fence in the yard of a public utility which are not open to the public and are only used to charge company vehicles. These devices should remain exempt from this regulation.

Example 2 shows EVSEs owned by the same public utility and located in the same town as those shown in Example 1. However, these Example 2 devices are in a public parking lot, open to the general public, and charge a fee to anyone who uses them, just like another set of privately owned EVSEs across the street.



Example 1: EVSE behind a fence owned by a public utility for their exclusive use.

Example 2: EVSE is a public parking lot owned by a public utility open to anyone who would like to use it and charging the general public by kWh and time.

A.2 Exemptions (b)

This exemption is inconsistent with other parts of the standard and potentially creates a loophole for anyone wanting to be exempt from these requirements. With this exemption in place, any device charging $0.00 per kWh could be considered exempt from NIST Handbook 44 Section 3.40. Although Handbook 130 specifies electrical energy kept, offered, or exposed for sale and sold as vehicle fuel must be in terms of kWh (section 2.33.2 of the Uniform Regulation for the Method of Sale of Commodities). This does not prohibit charging $0.00 per kWh to circumvent these requirements.

Presently, consumers encounter various methods of sale from one EVSE to another. Some EVSEs bill by the kilowatt-hour, others by the hour, and some employ both methods of sale. For consumers to make accurate value comparisons between EVSEs with these different billing criteria, the consumer must be informed of the total kilowatt-hours received following all transactions.

Exception A.2 (b) exempts devices charging by time alone (or $0.00 per kWh) from the requirements of Section 3.40. Removing Exemption (b) would explicitly mandate all EVSEs to adhere to the same standards if they charge fees, whether by time, or energy, or any other method. For instance, Section 2.2.6. EVSE Recorded Representation requires the receipt to provide the total quantity of energy delivered, regardless of the cost per kWh, which would allow all consumers to make value comparisons between EVSEs.

S.1

The requirement for an indicating element which is part of the EVSE itself is implied throughout the 3.40 Electric Vehicle Fueling Systems standard, but it isn't explicitly stated as in the NIST HB 44 3.30 Liquid-Measuring Devices code. This proposal would explicitly require an indicating element to be part of the device, using language nearly identical to the LMD code.

This proposal would enhance clarity for both manufacturers and state officials alike, enabling consistent enforcement across all weights and measure jurisdictions. Most EVSE models currently have some form of display, so requiring all devices to have them would not increase the cost of most EVSE devices. Moreover, it would be a non-retroactive requirement, taking effect with its adoption into the handbook. Consequently, existing devices would not need to be updated until they require replacement or significant upgrades to their measuring systems.

S.1.2

Vermont Weights & Measures has identified numerous cases where the information on the receipt regarding the energy dispensed differs from the information provided on the primary indicating element of a device. Most of these discrepancies arise from rounding or truncation, but other times are simply different numbers. While these inconsistencies have been minor and have not affected monetary calculations based on what we have seen thus far, they may be confusing to the consumer.

This change aims to provide a more consistent experience for the consumer while preserving manufacturers' flexibility. Unlike gas pumps or deli scales, the consumer may not be present watching the fueling process. The updated language would require the important transaction-related information (total quantity of energy dispensed, total price, unit price, sales tax, etc.) to be displayed on the primary indicating element after the transaction but also when the purchaser is present. Currently, many EVSEs display his information immediately following the completion of power delivery, typically without the consumer present. Additionally, the new language extends the time available to read and comprehend this information (to 1 minute from 15 seconds) before the primary indicating element resets to the default screen.

The revised language empowers manufacturers to display pertinent information during the charging process, so long as the consumer can access all the necessary information on the primary indicating element at their leisure during the fueling process.

S.1.3.2. & S.2.5.1

The number of decimal places required should be simplified because it will make it easier for manufacturers to comply with the requirements. Moreover, the fourth decimal place does not affect the final dollar amount charged to the consumer or the measurement integrity for most minimum measured quantity (MMQ) used during testing.

Numerous EVSE brands currently do not comply with the existing requirements in S.1.3.2. The quantities displayed on the primary indicating element and information on the primary recording element (i.e. receipt, statement, etc.) can be inconsistent in relation to energy delivered by a device. These errors are usually due to rounding or truncation. While these discrepancies have been small and have not impacted monetary computation based on what we have seen, they may be confusing to the consumer.

The proposed change to S.2.5.1. is put forth because this section is inconsistent with section S.1.3.2 EVSE Value of Smallest Unit. If the devices need to measure in finer units, then the computation of money-value should be displayed and be based on those units. As the cost increases, this discrepancy could lead to unnecessary computational errors.

In this case, presenting consistent information to the consumer will benefit the industry by increasing consumer confidence.

S.2.3.

Many, if not all, EVSEs require a network connection to complete and finalize transactions, and do not automatically time out

when the plug is returned to the holster/port. Vermont Weights & Measures has encountered one case where an EVSE lost its network connection during our testing and did not time out when the plug was returned to the holster/port. Figure 1 shows the charging timeline of a transaction where the inspector tested the device a little before 3:00 pm and received a network lost message and did not time out, as indicated with the sharp spike on the left-hand side of the graph. Later that same day just before 6:30 pm, someone else plugged their vehicle into the EVSE and charged their vehicle for roughly 2 hours on our account, as shown by the blue shaded block to the right of the graph.

This language would make the requirements which currently apply to power loss also apply to network loss.

S.2.4.2.

Vermont Weights & Measures has found that about 30% of DC EVSE are not supplying the maximum kW amount stated on the device and/or the app used to advertise and activate the EVSE when we test them with the Tesco

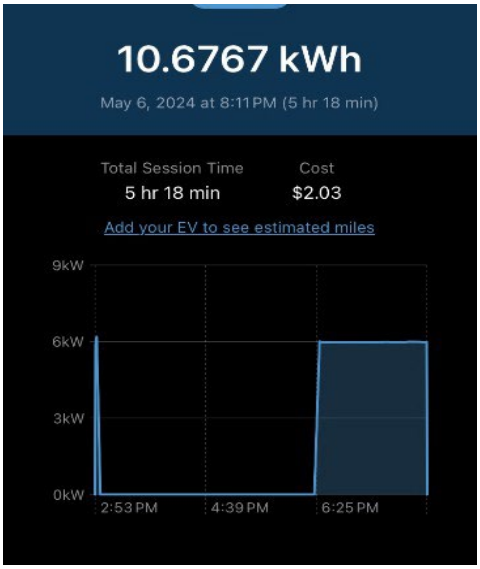


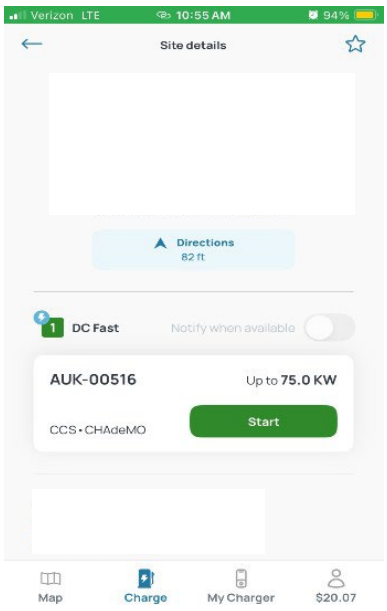
Figure 1: EVSE did not time out following a network loss during test and another consumer commenced charging on the Vermont account 2.5 hour after we had left the site.

PL4150 load emulator. Consumers rely on this information to select which EVSE they will use when multiple units are available, so the information presented to the potential purchaser must be accurate and correct. These changes will allow the consumer to make informed purchasing decisions, regardless of their preferences.

In some instances, a single app shows different maximum kW ratings at different times. Figure 2 shows charger AUK-00516 advertised as up to 25 kW at 10:49 am while at 10:55 am the same charger was advertised on the app as a maximum output of 75 kW. The inspector was on site this entire time, and nothing about the state of the EVSE had changed.

This proposed language would expand the labeling requirement that apply to the device itself to the apps used to locate and sometimes operate those same EVSEs, so the consumer knows what to expect in advance of arriving on site. It would also require the device to be labeled with the maximum power output the consumer can realistically expect at that time.

S.2.4.4



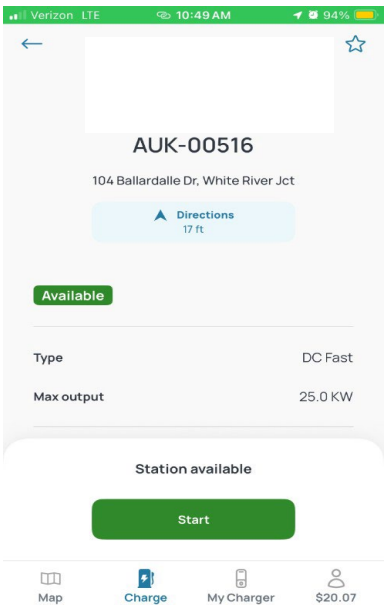


Figure 2: Two screen shot of the same EVSE taken 6 minutes apart on the same app

This language is put forward because we have discovered discrepancies between information displayed on the EVSE and information recorded in apps providing receipt or billing information or both for transactions. See the justification for S.1.2, S.1.3.2, and S.2.5.1 above.

S.7

The new language simplifies complicated wording. The proposed language requires the totalizer information to be available on the face of the device, regardless of whether the face is built into the device, or it is a remote display such as the vehicle, or a phone based app.

N.3.2

Type evaluations information belongs in the NCWM Publication 14 EVSE Devices not in Handbook 44. No other device type has type evaluation information in Handbook 44.

Possible Opposing Arguments:

The EVSE industry has argued and presumably will continue to argue that consumers don't use EVSE's like gas pumps or scales and are not present during the bulk of the transaction, so a display and consistency doesn't matter if the consumer ultimately gets what they paid for. The EVSE industry will likely advocate that the maintenance of screens adds significant cost to the operation of the device and creates an unnecessary financial burden on the industry.

Opposition may argue that all EVSE's operated by public utilities should not come under weights & measures jurisdiction because they are already regulated by public utility commissions and the like throughout the country.

Another opposing argument might be that if the power is free then the transaction is not commercial, and the standard should not apply.

The possible argument against standardizing the number of decimal places measuring the power dispensed does not make a difference in the end price, then they shouldn't have to include it in the recorded information.
A possible argument about the totalizer wording is that if it is available, why does it matter where and how it is available. The industry will argue that type evaluation criteria need to be somewhere, so Handbook 44 is where it should be.

The submitter requested Voting status in 2026.

Comments in Favor:

Regulatory:
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Industry:
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Advisory:
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Comments Against:

Regulatory:
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Industry:
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Advisory:
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Neutral Comments:

Regulatory:
•

Industry:
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Advisory:
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Item Development:
New proposal.

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

During the WWMA 2025 Annual Conference the following comments were received:

Mr. Matthew Douglas (State of California, Division of Measurement Standards): Recommends a Developing status, disagrees with changing the smallest indicated unit, feels the change should be to make the DC requirement match the AC value, will provide references in writing.

Mr. Mal Scalron (Tesla): Recommends a Developing status, including many minor changes to 3.40 that require stakeholder input, S.1. requires indicating element to be part of the device, EV charging is different than gas pumps, it takes 25 minutes or more to charge in that time a consumer may step away, the remote is more transparent and allows users to monitor the charging, S.1. needs a revision, S.2.4.2. agrees with the premise but the language is too broad, language should be limited, S.7 is not wording clarification but substantive change, no longer web based.

Mr. Mahesh Albuquerque (Colorado Division of Oil & Public Safety): Supports this item, this item has good intent, and recommends a Developing status.

The 2025 WWMA S&T Committee recommends a Developing status. The committee encourages the submitter to consider comments made during Open Hearings and seek feedback from stakeholders to continue developing this item.

CWMA 2025 Interim Meeting:

Ron DePouw – WI, supports the item as developing with the suggestion to add a date requirement for older equipment. Steve Griffith – NEMA, supports the item as developing, with additional clarifications and definitions needed. S.7. Totalizer information could be provided via a web portal.

The Committee recommends this item be given a Developing status based on comments received during open hearing.

NEWMA 2025 Interim Meeting:

Representative from VT – Gave a presentation explaining what is trying to be accomplished with each change. The presentation is available on the NEWMA Website.

Representative from ChargePoint – Recommends developing status. Revisions of small words but big practical changes. Support public utility exemption. We should develop language around how a device operates with network loss. S.2.4.2. Any app language.

Representative from NEMA – Display requirement encourage that remote display should be allowed. EVSE are usedn differently than gas pumps. Oppose as currently written.

Representative from NJ – S.2.4.4. The words “and billing” should be bolded. Billing system needs a definition. Recommends developing status.

Representative from SWTCH – Supports ChargePoint’s comments. Supports Developing status.

Representative from MN8 Energy – Supports ChargePoint’s comments.

Representative from NY – Recommends developing status.

Committee recommends a Developing Status for this item.

SWMA 2025 Annual Meeting:

The 2025 SWMA S&T Committee heard the following comments:

Robert Huff, Delaware – S.1.2 states indication will remain on device 1 minute. Recommends 5 minutes to align with gas pumps. Recommends Voting status.

Alison Wilkinson, Maryland – recommends Voting status as this item will help states and regulators clarify EV code and defines gray area.

Steve Griffith, NEMA - Recommends Developing Status. He believes it to have merit but needs more development.

Mauricio Mejia, Florida – Supports item as Developing. As it is proposed, it removes the verbiage that it does not apply to Non-Commercial Devices, by hour / time, and would like to have that added. Believes the primary indicator for all devices is a good idea.

The committee recommends Developing status on this item.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents.

FMT – FARM MILK TANKS

FMT-26.1 S.1.4. General.

Source:
USDA

Purpose:
To add a physical address requirement to the conversion charts of on farm milk bulk tanks.

Item under Consideration:
Amend NIST Handbook 44 Farm Milk Tanks Code as follows:

> **S.4.1. General.** – A volume chart shall show volume values only, over the entire range of the volume of the tank from 5% of capacity or 2m3 (500 gal) whichever is less, to its maximum capacity. All letters and figures on the chart shall be distinct and easily readable. The chart shall be substantially constructed, and the face of the chart shall be so protected that its lettering and figures will not tend easily to become obliterated or illegible. **The volume chart shall also include the address where the tank was most recently gauged.**

Previous Status:
New Proposal

Original Justification:
The calibrations that are performed on farm bulk tanks are specific for that location. If a bulk tank is moved it needs to be calibrated again. Without the address requirement on the chart it is harder to know at what location the calibration was perform at and if it is still valid.

The submitter acknowledges that milk bulk tank calibration agencies may have to update conversion chart templates.

Comments in Favor:

Regulatory:
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Industry:
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Advisory:
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Comments Against:

Regulatory:
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Industry:
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Advisory:
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Neutral Comments:

Regulatory:
-

Industry:
-

Advisory:
-

Item Development:
New Proposal.

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

During the WWMA 2025 Annual Conference the following comments were received:

Mr. Matthew Douglas (State of California, Division of Measurement Standards): Questioned how often milk tanks are calibrated as associated with the corresponding volume chart and gauge on the tank.

Mr. Loren Minich (NIST Office of Weights and Measures): Addressed the question posed by Mr. Matt Douglas regarding certain locations often moves milk tanks. He stated that the USDA is finding tanks in a location that was moved from another location and cannot verify if it is accurate in the new location. He clarified that the tank is gauged in the new location after being transported.

Mr. Matthew Douglas (State of California, Division of Measurement Standards): Appreciated the clarification from Mr. Minich and questioned if the item should be a Retroactive requirement. He stated consideration should be given to the implication for locations that don't have addresses already marked on the volume chart and the potential burden to put the address on the chart. He stated he has no position on the item.

The 2025 WWMA S&T committee recommends that this item be assigned a Developing Status and recommends the submitter consider the comments heard during open hearings.

Furthermore, the WWMA S&T Committee recommends the submitter work with the NCWM S&T Milk Meter Tolerance Task Group to further develop this item.

CWMA 2025 Interim Meeting:

Hearing no comments, the Committee recommends this item be given a Voting status.

NEWMA 2025 Interim Meeting:

Representative from NY – – Instead of using the word "address" change it to "physical location", or add the word "physical" to address. "recently gauged" should be changed to calibrated, certified or some other common weights & measure term.

Representative from USDA – Gauged is not a term used by USDA but is consistent with the rest of the section. These were words that OWM suggested.

Representative from NJ – Recommends a voting status with language changes proposed by NY.

Representative from VT – Recommends voting status.

The committee recommends voting status with the following language change:

S.4.1. General. – A volume chart shall show volume values only, over the entire range of the volume of the tank from 5% of capacity or 2m3 (500 gal) whichever is less, to its maximum capacity. All letters and figures on the chart shall be distinct and easily readable. The chart shall be substantially constructed, and the face of the chart shall be so protected that its lettering and figures will not tend easily to become obliterated or illegible. **The volume chart shall also include the physical address where the tank was most recently gauged.**

SWMA 2025 Annual Meeting:

The 2025 SWMA S&T Committee heard the following comments:

Matthew Curran, Florida – We recommend this item moving forward with a Developing status. The intent appears to capture when tanks are moved so regulators can ensure they are recalibrated, which we can appreciate. However, the proposal does not capture on-farm movement (i.e., same address), which should arguably require the same.

The committee recommends Developing status on this item.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents.

FMT-25.1 D UR.1. Installation

Source:
USDA-AMS-Dairy Programs

Purpose:
To create more robust installation requirements for On Farm Milk Bulk Tanks

Item under Consideration:
Amend the Handbook 44, Section 4.42. Farm Milk Tanks Code as follows:

UR.1. Installation – A stationary tank shall be rigidly installed in level without the use of removable blocks or shims under the legs. **A means shall be in place to prevent any readjustment or shifting out of level after the equipment's calibration. The means used shall be constructed of impervious material, maintained free of breaks, depressions and surface peelings. A stationary tank shall not move during the loading or unloading process.** If such tank is not mounted permanently in position, the current position on the floor for each leg shall be clearly and permanently defined.

(Amended 20XX)

Previous Status:
2025: Developing

Original Justification:
In many states in the Northeastern region such as NY, PA and VT this change is of little importance because the States already have a cement requirement on the books. However, in states with no such cement requirement such as CT or ME I find significantly higher rates of failed recertification in my capacity as a dairy regulator.

This will increase costs associated with the installation of on-farm milk bulk tanks and increase the time associated with the installation of on-farm milk bulk tanks.

The submitter recommended that this be a Retroactive requirement.

Comments in Favor:

Regulatory:

- 2025 Interim: Joel Northrop, USDA, gave a presentation and asked for this item to be assigned Voting status. Regarding comments from Florida, he also commented that he has had no issues regarding health. He finalized comments by agreeing to move forward with developmental status.
- 2025 Interim: Steve Timar, New York Department of Agriculture & Markets, expressed support as this proposal is already a requirement in NY and recommended a voting status.

Industry:

- 2025 Interim: None

Advisory:

- 2025 Interim: Loren Minnich, NIST OWM, recommended a developing status. He supports intent but believes the language is too prescriptive and noted alternative language in the NIST analysis.

Comments Against:

- **Regulatory:**2025 Interim: Matt Curran, Florida Department of Agriculture and Consumer Services, raised possible issues with floor pitting and permanently mounting to the floor creating a possible health issue. He recommended a development status.

Industry:

- 2025 Interim: None

Advisory:

- 2025 Interim: None

Neutral Comments:

Regulatory:

- 2025 Interim: Aaron Yanker, Colorado Department of Agriculture, recommended development status and suggested the submitter work with the Milk Meter Task Group.
- 2025 Interim: Regulators from California and Arizona recommended developmental status in order to work through some of the issues and comments heard.

Industry:

- 2025 Interim: None

Advisory:

- 2025 Interim: None

Item Development:

NCWM 2025 Annual Meeting: The Committee looks forward to the continued development of the item. No comments were heard at the Annual Meeting. However, the Committee did receive written comments after the meeting and has requested they be posted in supporting documents on the NCWM website.

NCWM 2025 Interim Meeting: The Committee believes this item needs additional development. The submitter provided new language to the Committee following the Interim Meeting and the Item Under Consideration reflects updated language. The original Item Under Consideration is shown below for reference. The Committee encourages the submitter to continue to collaborate with other regulators, NIST OWM, and other stakeholders to further develop the item.

UR.1. Installation. – A stationary tank shall be rigidly installed in level without the use of removable blocks or shims under the **leveling** legs**. The leveling legs must be permanently cemented using a form to the floor to prevent any adjustment after the calibration.** ~~**If such tank is not mounted permanently in position, the correct position on the floor for each leg shall be clearly and permanently defined.**~~ **A stationary tank shall not move during the loading or unloading process.**

Contact: Joel Northrop
jnorthrop@fedmilk1.com

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

During the WWMA 2025 Annual Conference the following comments were received:

No comments were received during open hearings.

The 2025 WWMA S&T committee recommends that this item be assigned a Developing Status. The WWMA S&T Committee recommends the submitter work with the NCWM S&T Milk Meter Tolerance Task Group to further develop this item.

CWMA 2025 Interim Meeting:

Ron DePouw – WI, supports the item and is in favor of this update.

The Committee recommends this item be given a Voting status based on comments received during open hearing.

NEWMA 2025 Interim Meeting:

Representative from NY – Recommends voting status with the recent updated changes.

Representative from NJ – Recommends voting status.

Representative from VT – Recommends voting status.

Representative from ME – Recommends voting status.

Representative from CT - Recommends voting status.

Representative from NH - Recommends voting status.

The committee recommends a voting status for this item.

SWMA 2025 Annual Meeting:

The 2025 SWMA S&T Committee heard the following comments:

Matthew Curran, Florida – We recommend this item moving forward with a Voting status. We appreciate the submitter acknowledging our previous concerns and believe the changes now allow for compliance without receiving debits during IMS rating inspections.

The committee recommends Voting status on this item.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents.

TIM – TIMING DEVICES

TIM-26.1 S.1.1.3. Value of Smallest Division

Source:
NIST Office of Weights and Measures

Purpose:
To provide clarification that the maximum interval of time specified for Electric Vehicle Supply Equipment (EVSE) that have an integral time-based feature is one minute.

Item under Consideration:
Amend NIST Handbook 44 Timing Devices Code as follows:

S.1.1.3. Value of Smallest Unit. – The value of the smallest unit of indicated time and recorded time, if the device is equipped to record, shall not exceed the following.

(a) For parking meters:

(1) one-half hour on parking meters indicating time in excess of two hours; or

(2) six minutes on parking meters indicating time in excess of one but not greater than two hours.

(b) For an EVSE equipped with an integral time-based feature~~:~~**, one minute for each separate service related to a delivery of electrical energy to be displayed in:**

(1) ~~**One**~~minute**s** on an EVSE **when** indicating **quantities of** time not greater than or **that are** equal to 60 minutes; or

(2) **a combination of** hours and minutes on an EVSE indicating time intervals in excess of 60 minutes.

(c) For all other devices five minutes, except those equipped with an in-service light.

(Amended 1975~~ **and,**~~ 2021**, and 20XX**)

Previous Status:
New Proposal

Original Justification:
When S.1.1.3. Value of Smallest Unit was amended in 2021, the intent was to specify an interval of no more than one minute for EVSE that have an integral time-based feature. While S.1.1.3.(b)(1) is very clear in regard to requiring an interval of no more than one minute for EVSE that accesses a time-based fee of 60 minutes or less, S.1.1.3.(b)(2) only references "hours and minutes" but does not specify a maximum interval for an EVSE that accesses a time-based fee of more than 60 minutes.

The application of paragraph S.1.1.3 (b)(2) in the current version of NISTHandbook 44 is unclear for devices measuring time-related services of more than 60 minutes. Some devices may be designed with an interval that exceeds a one-minute interval, as was intended when this item was amended in 2021 to incorporate EVSE that access time-related fees.

The submitter requested Voting status in 2026.

Comments in Favor:

Regulatory:
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Industry:
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Advisory:
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Comments Against:

Regulatory:
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Industry:
-

Advisory:
-

Neutral Comments:

Regulatory:
-

Industry:
-

Advisory:
-

Item Development:
[Explain any changes made to the original proposal and committee recommendations]

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

During the WWMA 2025 Annual Conference the following comments were received:

Mr. Loren Minich (NIST Office of Weights and Measures): After reviewing the time code specifications of what is required, the item is intended to clarify the intervals should not exceed 1 minute. If it is over 60 minutes, then it can display hours and minutes.

Mr. Matthew Douglas (State of California, Division of Measurement Standards): Recommended the item be assigned a Voting Status.

The 2025 WWMA S&T Committee recommends a Voting status. The committee believes the item is fully developed and ready for a vote

CWMA 2025 Interim Meeting:

Loren Minnich – NIST OWM, commented that this clarification was needed to be clear that the maximum value is 1 minute. Supports as voting.

The Committee recommends this item be given a Voting status based on comments received during open hearing.

NEWMA 2025 Interim Meeting:

Representative from NJ – Item has merit, but the language needs work. In the future device could be used as both parking meter and/or EV charging. The code should separate analog and digital parking meters due to potential large tolerance or have EVSE fall under digital. Recommends developing status.

SWMA 2025 Annual Meeting:

No comments were heard

The committee has no recommended status for this item.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents

MDM – MULTIPLE DIMENSION MEASURING DEVICES

MDM-25.1 I Multiple Sections Regarding Adding Volumetric Measuring Devices to Section 5.58.

Source:
Multiple Dimension Measuring Devices Work Group

Purpose:
Rename and amend Section 5.58. Multiple Dimension Measuring Devices to incorporate devices that measure volume directly rather than measuring three dimensions to calculate a volume. These devices measure, either statically or in-motion, the volume of a commodity, such as sand, gravel, rock, and dirt, etc., which is transported in a truck or other conveyance. The proposal will amend the application paragraphs and add or amend the specifications, test notes, tolerances and user requirements in this section to ensure these devices are designed to operate correctly and to facilitate their proper operation and evaluation.

Item under Consideration:
Amend the Handbook 44, Section 5.58. Multiple Dimension Measuring Devices Code as follows:

Section 5.58. Multiple Dimension and Volumetric Measuring Devices

A. Application

A.1. General. – This code applies to**:** ~~**dimension and volume measuring devices used for determining the dimensions and/or volume of objects for the purpose of calculating freight, storage, or postal charges based on the dimensions and/or volume occupied by the object. A multiple dimension measuring device:**~~

(a) Multiple Dimension Measuring Devices used for determining the dimensions and/or dimensional volume of objects which are generally hexahedron-shaped but may be irregularly-shaped for the purpose of calculating freight, storage, or postal charges based on the dimensions and/or volume occupied by the object.~~is generally used to measure hexahedron-shaped objects; and~~

(Added 2008) **(Amended 20XX)**

(b) Volumetric Measuring Devices that make multiple measurements to determine the volume of a bulk commodity~~may be used to measure irregularly-shaped objects~~.

(Added 2008) **(Amended 20XX)**

(Amended 2008 **and 20XX**)

~~**A.2. Other Devices Designed to Make Multiple Measurements Automatically to Determine a Volume** – **Insofar as they are clearly applicable, the provisions of this code apply also to devices designed to make multiple measurements automatically to determine a volume for other applications as defined by Section 1.10. General Code Paragraph G-A.1. Commercial and Law-Enforcement Equipment.**~~

A.2~~3~~. Additional Code Requirements. – In addition to the requirements of this code, Multiple Dimension **and Volumetric** Measuring Devices shall meet the requirements of Section 1.10. General Code.

(Amended 20XX)

A.3~~4~~. Exceptions. – This code does not apply to:

(a) devices designed to indicate automatically (with or without value-computing capabilities) the length of fabric passed through the measuring elements (also see Section 5.50. for Fabric-Measuring Devices);

(b) devices designed to indicate automatically the length of cordage, rope, wire, cable, or similar flexible material passed through the measuring elements (also see Section 5.51. for Wire- and Cordage-Measuring Devices); or

(c) any linear measure, measure of length, or devices used to measure individual dimensions for the purpose of assessing a charge per unit of measurement of the individual dimension (also see Section 5.52. for Linear Measures).

~~**A.5. Type Evaluation. – The National Type Evaluation Program (NTEP) will accept for type evaluation only those devices that comply with all requirements of this code.**~~

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S.1.4. Dimensions Indication, Multiple Dimension Measuring Device. – If ~~**in**~~**during** normal operation the device indicates or records only volume, a testing mode shall be provided to indicate dimensions for all objects measured.

(Amended 20XX)

S.1.5. Value of ~~Dimension/Volume~~Measuring Division Units. – The value of a ~~**device**~~**measuring** division "d" expressed in a unit of dimension **or volume** shall be ~~**presented in a decimal format. The value of "d" for each measurement axis shall be in the same unit of measure and**~~ expressed as:

(a) 1, 2, or 5;

(b) a decimal multiple or submultiple of 1, 2, or 5; or

(c) a **decimal** binary submultiple of a specific U.S. customary unit of measure.

Examples: device divisions may be 0.01, 0.02, 0.05; 0.1, 0.2, or 0.5; 1, 2, or 5; 10, 20, 50, or 100; 0.5, 0.25, 0.125, 0.0625, etc.

(Amended 20XX)

S.1.5.1. Value of Measuring Division Units, Multiple Dimension Measuring Device.

(a) The value of "d" for each measurement axis shall be in the same unit of measure.

(Amended 20XX)

~~**S.1.5.1**~~**(b)** For Indirect Sales~~. In~~ in addition to the values specified in S.1.5. Value of ~~**Dimension/Volume**~~**Measuring** Division Units, the value of the division may be 0.3 inch and 0.4 inch.

(Amended 20XX)

~~**S.1.5.2.(c) Devices Capable of Measuring Irregularly Shaped Objects.** –~~ For devices capable of measuring irregularly shaped objects, the value of the **measuring** division size (d) shall be the same for the length axis (x) and the width axis (y) and may be different for the height axis (z), provided that electronic rotation of the object to determine the smallest hexahedron is calculated in only a two-dimension horizontal plane, retaining the stable side plane as the bottom of the hexahedron.

(Added 2008) **(Amended 20XX)**

S.1.6. Customer Indications and Recorded Representations.

S.1.6.1. Multiple Dimension Measuring Devices. – Multiple dimension measuring devices or systems must provide information as specified in Table S.1.6.**1.** Required Information to be Provided by Multiple Dimension Measuring Systems. As a minimum, all devices or systems must be able to meet either column I or column II in Table S.1.6.**1.** Required Information to be Provided by Multiple Dimension Measuring Systems.

(Amended 2004 **and 20XX**)

Table S.1.6.1.
Required Information to be Provided by Multiple Dimension Measuring Systems

Information	Column I[1]	Column II[1]		Column III
	Provided by device	Provided by invoice or other means		Provided by invoice or other means as specified in contractual agreement
		Customer present	Customer not present	
1. Device identification[2]	D or P	P	P	P or A
2. Error message (when applicable)	D or P	P	N/A	N/A
3. Hexahedron dimensions[3]	D or P	P	P	P or A
4. Hexahedron volume (if used)[3]	D or P	P	P	P or A
5. Actual weight (if used)[3]	D or P	P	P	P or A
6. Dimensional Offset (if used)[3]	D or P	N/A	N/A	N/A
7. Hexahedron measurement statement[4]	D or P or M	P	P	P or G

Table S.1.6.1.
Required Information to be Provided by Multiple Dimension Measuring Systems

A = AVAILABLE UPON REQUEST BY CUSTOMER[5]
D = DISPLAYED
G = PUBLISHED GUIDELINES OR CONTRACTS
M = MARKED
N/A = NOT APPLICABLE
P = PRINTED or RECORDED IN A MEMORY DEVICE and AVAILABLE UPON REQUEST BY CUSTOMER[5]

Notes:
[1] As a minimum all devices or systems must be able to meet either column I or column II.

[2] This is only required in systems where more than one device or measuring element is being used.

[3] Some devices or systems may not utilize all of these values; however, as a minimum either hexahedron dimensions or hexahedron volume must be displayed or printed.

[4] This is an explanation that the dimensions and/or volume shown are those of the smallest hexahedron in which the object that was measured may be enclosed rather than those of the object itself.

[5] The information "available upon request by customer" shall be retained by the party having issued the invoice for at least 30 calendar days after the date of invoicing.

(Amended 2004**, ~~and~~** 2021**, and 20XX**)

S.1.6.2. Volumetric Measuring Devices. – Devices that determine the volume of a bulk commodity shall:

(a) indicate or record an error message as specified in S.1.8.2. Indications Below Minimum and Above Maximum, Volumetric Measuring Device.

(b) indicate and record the net volume of the commodity

(Added 20XX)

S.1.6.3. Recorded Representations, Volumetric Measuring Devices. – When interfaced with the elements that are necessary for a point-of-sale system, the recorded representation provided shall contain:

(a) the net volume of the commodity

(b) the identity of the commodity

(c) the unit price of the commodity

(d) the total price of the commodity

(Added 20XX)

S.1.7. Minimum Measurement.

S.1.7.1. Multiple Dimension Measuring Devices. – Except for entries of dimensional offset, the minimum measurement by a device is 12 d. The manufacturer may specify a longer minimum measurement. For multi-interval devices, this applies only to the first measuring range (or segment) of each measurement axis (length, width, and height).

(Amended 20XX)

S.1.7.2. Volumetric Measuring Devices. – The minimum measurement by a device is 12 d. The manufacturer may specify a larger minimum measurement. For multi-interval devices, this applies only to the first measuring range (or segment).

(Added 20XX)

(Amended 2017**, ~~and~~** 2021**, and 20XX**)

S.1.8. Indications Below Minimum and Above Maximum.

S.1.8.1. Multiple Dimension Measuring Device. – When objects are smaller than the minimum dimensions identified in paragraph S.1.7.**1. Multiple Dimension Measuring Devices** or larger than any of the **marked** maximum dimensions plus 9 d, and/or maximum volume marked on the device plus 9 d, or when a combination of dimensions, including dimensional offset, for the object being measured exceeds the measurement capability of the device, the indicating or recording element shall either:

(a) not indicate or record any usable values; or

(b) identify the indicated or recorded representation with an error indication.

(Amended 2004, 2017, ~~and~~ 2021**, and 20XX**)

S.1.8.2. Volumetric Measuring Device. – When the commodity being measured is smaller than the minimum measurement identified in paragraph S.1.7.2 Volumetric Measuring Devices or larger than the marked maximum volume plus 9 d, or when the commodity being measured exceeds the measurement capability of the device, the indicating or recording element shall either:

(a) not indicate or record any usable values; or

(b) identify the indicated or recorded representation with an error indication.

(Added 20XX)

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S.4.1. Multiple Dimension and Volumetric Measuring Devices, Main Elements, and Components of Measuring Devices. – Multiple dimension **and volumetric** measuring devices, main elements of multiple dimension **and volumetric** measuring devices when not contained in a single enclosure for the entire dimension/volume measuring device, and other components shall be marked as specified in Table S.4.1.a. Marking Requirements for Multiple Dimension **and Volumetric** Measuring Systems and explained in the accompanying notes, Table S.4.1.b. Multiple Dimension **and Volumetric** Measuring Systems Notes for Table S.4.1.a.

Table S.4.1.a. **Marking Requirements for Multiple Dimension and Volumetric Measuring Systems**				
	Multiple Dimension and Volumetric Measuring Equipment			
To Be Marked With ⇓	**Multiple Dimension or Volumetric Measuring Device and Indicating Element in Same Housing**	**Indicating Element not Permanently Attached to Multiple Dimension or Volumetric Measuring Element**	**Multiple Dimension or Volumetric Measuring Element Not Permanently Attached to the Indicating Element**	**Other Equipment (1)**
Manufacturer's ID	x	x	x	x
Model Designation	x	x	x	x
Serial Number and Prefix	x	x	x	x (2)
Certificate of Conformance Number (8)	x	x	x	x (8)
Minimum and Maximum Dimensions **or Volume ~~for Each Axis for Each Range in Each Axis~~** (3)(9)	x	x	x	
Value of Measuring Division, d **~~(for each axis and range)~~** (9)	x	x	x	
Temperature Limits (4)(9)	x	x	x	
Minimum and Maximum ~~s~~Speed (5)(9)	x	x	x	
Special Application (6)(9)	x	x	x	
Limitation of Use (7)(9)	x	x	x	

1 (Amended 2016 **and 20XX**)

Table S.4.1.b. **Multiple Dimension and Volumetric Measuring Systems Notes for Table S.4.1.a.**
1. Necessary to the dimension and/or volume measuring system, but having no effect on the measuring value, e.g., auxiliary remote display, keyboard, etc.
2. Modules without "intelligence" on a modular system (e.g., printer, keyboard module, etc.) are not required to have serial numbers.
3. **For multiple dimension measuring systems, t~~T~~**he minimum and maximum dimensions **for each axis and for each range in each axis ~~(using upper or lower case type)~~** shall be marked. For example: Length: min _____ max _____ Width: min _____ max _____ Height: min _____ max _____ **For volumetric measuring devices the minimum and maximum volume shall be marked. For example:** **Volume: min _____ max _____**
4. Required if the range is other than − 10 °C to 40 °C (14 °F to 104 °F).

Table S.4.1.b. Multiple Dimension and Volumetric Measuring Systems Notes for Table S.4.1.a.
5. Multiple dimension measuring ~~**devices**~~**systems**, which require that the object or device be moved relative to one another, shall be marked with the minimum and maximum speeds at which the device is capable of making measurements that are within the applicable tolerances. **Volumetric Measuring Systems shall be marked with the minimum and maximum speeds at which the device is capable of making measurements that are within the applicable tolerances.** 6. A device designed for a special application rather than general use shall be conspicuously marked with suitable words visible to the operator and the customer restricting its use to that application. 7. Materials, shapes, structures, combination of object dimensions, speed, spacing, minimum protrusion size, or object orientations that are inappropriate for the device or those that are appropriate. 8. Required only if a Certificate of Conformance has been issued for the equipment. 9. This marking information may be readily accessible via the display. Instructions for displaying the information shall be described in the NTEP CC **if not marked on the components of the system**.

(Amended 2004, 2008, ~~**and**~~ 2016**, and 20XX**)

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N.1. Test Procedures.

N.1.1. General. ~~—The~~

N.1.1.1. Multiple Dimension Measuring Device – **A** device **that measures the dimensions and/or dimensional volume of an object** shall be tested using test standards and objects of known and stable dimensions.

(Added 20XX)

N.1.1.2. Volumetric Measuring Devices – A device that measures the volume of a bulk commodity shall be tested using a transfer standard. The means of conveyance of the transfer standard, e.g., vehicles, rail cars, etc., shall be representative of the conveyance used during the normal operation of the device.

(Added 20XX)

(Amended 20XX)

N.1.2. Position Test. – Measurements ~~**are**~~**shall be** made using different positions of the test object **or conveyance** ~~**and**~~ consistent with the manufacturer's specified use for the device.

(Amended 20XX)

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N.1.4. Test Object or Transfer Standard Size. – Test objects **or transfer standards** may vary in size from the smallest **volume or** dimension to the largest **volume or** dimension marked on the device, and for field verification examinations, shall be an integer multiple of "d."

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N.1.4.3. Transfer Standards. – The volume of the transfer standard must be known to an expanded uncertainty (coverage factor k = 2) of not more than one-third of the applicable device tolerance. The volume shall also be checked to the same uncertainty when used at the extreme values of the influence factors.

The volume of the transfer standard shall be verified using a reference standard that is traceable to NIST (or equivalent national laboratory) and meets the tolerances expressed in NIST Handbook 44 Fundamental Considerations, paragraph 3.2 (i.e., one-third of the smallest tolerance applied to the device).

(Added 20XX)

(Amended 2008~~ and~~, 2012**, and 20XX**)

N.1.5. Digital Zero Stability. – A zero indication change test shall be conducted on all devices which ~~show~~**display** a digital zero. After the removal of any test object **or conveyance**, the **device shall return to a** zero indication~~ shall not change~~. (Also see G-UR.4.2. Abnormal Performance.)

(Amended 20XX)

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T.1. Principles~~**Design. The tolerance for a multiple dimension measuring device is a performance requirement independent of the design principle used.**~~

T.1.1. Design. – The tolerance for a multiple dimension measuring device or volumetric measuring device is a performance requirement independent of the design principle used.

(Added 20XX)

T.1.2. Device Division. – The tolerance for a multiple dimension measuring device or volumetric measuring device is related to the value of the measuring division (d) and is expressed in terms of d.

(Added 20XX)

(Amended 20XX)

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T.3. Tolerance Values. ~~**– The maintenance and acceptance tolerance values shall be ± 1 division.**~~

T.3.1. For Volumetric Measuring Devices.

(a) Maintenance Tolerance Values. – The maintenance tolerance values shall be as specified in Table T.3.1. Maintenance Tolerances.

(b) Acceptance Tolerance Values. – The acceptance tolerance values shall be one-half of the maintenance tolerance values with a minimum tolerance of 1 d.

(Added 20XX)

Table T.3.1. Maintenance Tolerances (All values in this table are in measuring divisions)			
1	**2**	**3**	**4**
0 – 200[1]	**201 – 400**	**401- 800**	**801 +**
[1] See S.1.7. Minimum Measurement (12 d).			

(Added 20XX)

T.3.2. For Multiple Dimension Measuring Devices. – The maintenance and acceptance tolerance values shall be ± 1 division.

(Added 20XX)

(Amended 2004 **and 20XX**)

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UR.3.1. Minimum and Maximum Measuring Ranges. – A device shall not be used to measure objects ~~**smaller than**~~ **or a commodity in an amount less than** the minimum or ~~**larger**~~**more** than the maximum **volume or** dimensions marked on the device.

(Amended 20XX)

UR.4.1. Zero or Ready Condition. – The zero-setting adjustment of a multiple dimension measuring device **or volumetric measuring device** shall be maintained so that, with no object **or conveyance** ~~**in or**~~ on **or within the range of** the measuring element, the device shall indicate or record a zero or ready condition.

(Amended 20XX)

And Appendix D, Definitions amend the definition of "d," dimension division value as follows:

measuring division, value of "d," ~~**dimension division value.**~~ – The smallest increment that the device displays for any axis and length of object in that axis **or for the total volume**. [5.58]

(Amended 20XX)

dimensional volume. - Volume of the smallest rectangular box which fully encloses the object, and is the product of the indicated values of length axis (x), width axis (y) and height axis (z) (dv = x × y × z). [5.58]

(Added 20XX)

Previous Status:
2025: Informational

Original Justification:
These devices are already in the marketplace and two manufacturers have a Provisional NTEP Certificate of Conformance. The changes to NIST Handbook 44 will permit the certificates to be accepted in all states. The MDMD Work Group voted to support this proposal with no opposing votes.

Some may believe that the tolerance are rather large. Currently in the marketplace methods being used include front end loaders with the bucket being an approximation of X cubic yard. Scales are also being used with a conversion from weight to cubic yards. The conversion from weight to cubic yards using a conversion number for the commodity being weighed. Weighing fails to take into account the moisture content of the commodity or the accuracy of the conversion number for the actual commodity being weighed. The MDMD direct volume devices accurately measure the actual volume of the commodity being sold.

To arrive at the proposed tolerance for these devices the current MDMD tolerance was used as a starting point. The current MDMD maintenance and acceptance tolerance is 1d for the entire measurement range of each of the 3 axes. Looking at the many NTEP Certificates for devices making 3 measurements to determine a volume the tolerance at the largest dimension in terms of percent was consistently 0.2% for each axis. This means the effective tolerance for the measurement of volume is plus or minus 0.6%. The maintenance tolerance proposed for devices directly measuring volume is slightly tighter at 0.5% at the break points in the proposed tolerance table with acceptance tolerance being one half of maintenance tolerance and a minimum tolerance of 1d.

The submitter recommends that this be a Retroactive Voting item in 2025.

Comments in Favor:

Regulatory:

- 2025 Annual: Mike Harrington, representing the Iowa Department of Agriculture Weights and Measures Bureau, commented that he has witnessed this device in use and supports this item.
- 2025 Interim: Mike Harrington, Iowa Department of Agriculture, commented that he observed this system in use, and it was accurate when compared to vehicle scales. However, the aggregate seemed to retain moisture, affecting the readings. After redetermining the density, accuracy was restored.

Industry:

- 2025 Annual: Derek Schussle, representing Walz Scale, commented that there are real benefits to using this system.
- 2025 Annual: Adrian Ruthe, representing Loadscan Ltd, stated that these scanners are not a replacement for scales and that they are intended to only meet a niche application for a niche market. He continued that the type approval will limit the applications for this device and that there are a lot of checks and balances built in to ensure the device only functions when all criteria are met.
- 2025 Interim: Derek Schussle, Walz Scale, recommended voting status.

Advisory:

- 2025 Interim: Richard Suiter, Multiple Dimension Measuring Devices Work Group, gave a presentation and recommended voting status. He explained that devices with the provisional NTEP CCs are not being allowed in some locations and NTEP needs a code to evaluate the items against.

Comments Against:

Regulatory:

- 2025 Annual: Greg VanderPlaats, representing the Minnesota Commerce Department Weights and Measures Division, stated that he has tolerance table concerns and that the tolerance per load is too high for the divisions listed in that table. He stated that as written, the smallest tolerance applied would be 3.5% of the load and that that is too large. Additionally, there is nothing in this code that limits the use of this device to a niche market. Jeff Gibson, representing NTEP, responded that limitations for this device are listed on the NTEP Certificate of Conformance.
- 2025 Annual: Matthew Douglas, representing the California Division of Measurement Standards, stated his agreement with NIST OWM, the SMA, and Greg VanderPlaats, and requested that this item be downgraded to informational to address the concerns that those parties raised.
- 2025 Annual: Michael Brooks, representing the Arizona Department of Agriculture, Environmental and Consumer Protection Division, stated that establishing this as a code and leaving specs unaddressed could open issues later when a less scrupulous manufacturer creates their own device. Jeff Gibson, representing NTEP, stated that specification changes are addressed in Pub 14 and that NTEP testing will keep lesser devices from being approved.
- 2025 Interim: None

Industry:

- 2025 Annual: Cory Hainy, representing the Scale Manufactures Association, is opposed to this item being a Voting item because there needs to be more clarity regarding commodity limitations, out of level indicators, and error conditions. Dick Suiter, representing Richard Suiter Consulting, responded that commodities to be used by this device are listed on the NTEP Certificate of Conformance and that any error in reading will result in an error code on the device. Mr. Hainy responded that he was glad that current manufacturers are developing these devices to account for scenarios not addressed in this item, but is unsure if future developers will.
- 2025 Interim: None

Advisory:

- 2025 Annual: Loren Minnich, representing NIST OWM, commented that NIST OWM acknowledges the work of the subgroup and is supportive of this item, but that NIST OWM has concerns regarding the number of changes that have occurred within this item and the lack of time allowed for the Body to review those changes. He also stated that S.1.6.3. needs a title change as that code should only apply to volumetric devices.
- 2025 Interim: None

Neutral Comments:

Regulatory:

- 2025 Annual: Kurt Floren, representing LA County ACWM, asked what would happen if a truck that is to be measured is so trapezoidal that the sensors cannot get a good reading and what would happen if the product being measured flexes the container that is being measured. He also asked if there were any speed concerns. Dick Suiter, representing Richard Suiter Consulting, answered that vehicle types and speed requirements are identified in the NTEP Certificate of Conformance and that if a scanner is not able to read a container it will not function.
- 2025 Annual: Éric Turcotte, representing Measurement Canada, stated in response to the presentation that in fact this device is not approved for use in Canada due to accuracy concerns, contrary to what was presented to the body. Jeff Gibson, representing NTEP, responded there isn't a permanence test for the devices but NTEP conducts repeatability tests and repeatability isn't a concern.
- 2025 Interim: Matt Douglas, California Division of Measurement Standards, noted that a more recent version of the proposal is available on the NCWM website. He recommended blocking the MDM items together and assigning a developing status.

Industry:

- 2025 Annual: John Hathaway, representing Murray Equipment, Inc., asked how one would prove the system. Dick Suiter, representing Richard Suiter Consulting, answered that a verified container was created to serve as a transfer standard.
- 2025 Interim: John Hathaway, Murray Equipment, asked for the relevant NTEP CC numbers to be provided, resulting in them being identified as 23-001P and 24-001P.
- 2025 Interim: Cory Haney, Scale Manufacturers Association, recommended developmental status and raised concerns with out of level device conditions, speed, and direction of travel.

Advisory:

- 2025 Interim: Loren Minnich, NIST OWM, recommended combining the MDM items into a single proposal and assigning a developmental status. NIST OWM recommends a thorough investigation of other requirements that need amendment to apply to devices designed to make multiple measurements automatically to determine the volume of a commodity as opposed to multiple dimension measuring devices used to determine freight, postage, or shipping charges.
- 2025 Interim: Jeff Gibson, NCWM NTEP, clarified that the NTEP CCs are limited to aggregate based items.

Item Development:
NCWM 2025 Annual Meeting: Following comments during the open hearing and after requesting clarification from the developer during the work session, the Committee modified Table T.3.1 tolerances and added "Volumetric Measuring Devices" to the title of S.1.6.3. During the voting session, Sherry Turvey, representing the CWMA, requested the item be downgraded to Informational due to substantial changes made by the NCWM S&T Committee during the Annual Meeting work session. Considering this request and prior open hearing comments on the item's development, the Committee agreed to downgrade the item to Informational before it was voted on by the body.

NCWM 2025 Interim Meeting: The Committee has combined MDM-25.1, MDM-25.2, and MDM-25.3 into a single item and updated the proposal to include revisions from NIST OWM and agreed upon by the submitter. The Committee believes the item has merit, is fully developed, and has assigned it a voting status.

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

During the WWMA 2025 Annual Conference the following comments were received:

Mr. Cory Hainy (Representing the Scale Manufacturers Association): SMAs position is published on Publication 16 prior to the 2025 NCWM Annual Conference and recommends further development of this item.

The 2025 WWMA S&T Committee recommends this item remain Informational. No comments were heard from the Multiple Dimensions Measuring Devices Work Group.

The committee encourages the Multiple Dimensions Measuring Devices Work Group to consider the comment made during Open Hearings and seek feedback from stakeholders to continue developing this item.

CWMA 2025 Interim Meeting:

Richard Suiter – Richard Suiter Consulting / MDMD Volume Focus Group, gave a presentation in support of this item, and provided written comments which are on the CWMA site.

Greg VanderPlaats – MN, expressed several concerns for this item and provided written comments which are on the CWMA site. Suggests that the minimum measurement be raised to at least 20 d; and that several marking requirements be revisited such as min/max speeds, direction of travel, special application vs. general use, and materials which are allowed or disallowed.

Richard Suiter – Richard Suiter Consulting / MDMD Volume Focus Group, provided written responses to Mr. VanderPlaats which can be found on the CWMA site. Mr. Suiter commented that the minimum measurement size is comparable to limits already established in the Scales Code, and that raising this value could eliminate the ability for consumers to purchase products in a pickup truck. Concerns for the marking requirements were also addressed in Mr. Suiter's written comments.

Mike Harrington – IA, recommends the item remain informational to allow for more discussion at the National meeting. Agreed with many points from MN.

The Committee recommends this item remain Informational to address comments made during open hearing.

NEWMA 2025 Interim Meeting:

Representative from NY – Supports voting status.

Submitted supporting documents available on NEWMA website.

The committee recommends a voting status for this item.

SWMA 2025 Annual Meeting:

The 2025 SWMA S&T Committee heard the following comments:

Corey Hainey, SMA - They are not in support of Voting Status but recommends Developing Status. Currently, it lacks indications for certain errors.

Online comments were submitted to the committee.

The committee recommends Developing status on this item.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents.

MDM-26.1 S.1.5.2. Devices Capable of Measuring Irregularly Shaped Objects

Source:
Multiple Dimension Measuring Device Workgroup

Purpose:
Amend Handbook 44 to permit Multi-Interval Multi-Dimensional Measuring Devices (MDMD) to measure irregularly shaped objects. This update reflects advancements in technology and aligns with international standards, such as OIML R129, which already accommodates Multi-Interval MDMD for measuring objects with irregular shapes. By incorporating these changes, the regulations will support the adoption of innovative measurement technologies while maintaining consistency with global practices.

Item under Consideration:
Amend NIST Handbook 44 Multiple Dimension Measuring Devices Code as follows:

> **S.1.5.2. Devices Capable of Measuring Irregularly-Shaped Objects. –** For devices capable of measuring irregularly shaped objects, the value of the division size (d) shall be the same for the length axis (x) and the width axis (y) and may be different for the height axis (z), provided that electronic rotation of the object to determine the smallest hexahedron is calculated in only a two-dimension horizontal plane, retaining the stable side plane as the bottom of the hexahedron. ***For multi-interval devices, if the measuring interval for each axis is determined automatically according to the actual dimension being measured, then the division size (d) for each dimension (length, width, height) shall not differ by the orientation of the measured item in the x-y plane.***
> ***(Nonretroactive as of January 1, 20XX)***

Previous Status:
New Proposal

Original Justification:
When the MDMD requirements were initially established, there were no Multi-Interval MDMD devices available on the market. However, with advancements in technology, more multi-interval devices are now being developed, necessitating updates to the regulations to ensure they remain relevant and effective. These updates will also support alignment with existing international standards, such as OIML R129, which currently permits Multi-Interval MDMD devices to measure irregularly shaped objects.

The submitter requested voting status.

Comments in Favor:

Regulatory:
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Industry:
-

Advisory:
-

Comments Against:

Regulatory:
-

Industry:
-

Advisory:
-

Neutral Comments:

Regulatory:
-

Industry:
-

Advisory:
-

Item Development:
New proposal

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

No comments were received during open hearings.

The 2025 WWMA S&T Committee does not recommend a status. During Open Hearings there was no technical analysis available, and no comments were heard on the item. The committee encourages feedback from stakeholders and looks forward to an analysis from NIST OWM to help formulate a position.

CWMA 2025 Interim Meeting:

Richard Suiter – Richard Suiter Consulting / MDMD Volume Focus Group, commented that he is a member of the work group for this item, and they believe it is developed and ready for voting.

The Committee recommends this item be given a Voting status based on comments received during open hearing.

NEWMA 2025 Interim Meeting:

No comments. No Recommendation.

SWMA 2025 Annual Meeting:

No comments were heard.

The committee has no recommended status for this item.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents

OTH – OTHER ITEMS

OTH-25.1 2.26 Weigh-in-Motion Systems Used for Vehicle Direct Enforcement

Source:
New York City Department of Transportation

Purpose:
Add a new Section 2.26 Weigh-In-Motion Systems Used for Vehicle Direct Enforcement to standardize the testing method for WIM systems for jurisdictions involved in direct weight limit enforcement. The update is being requested by NYS Dept of Ag & Markets, NJ Off. of W & M, Oregon Dept of Ag, NYCDOT, Washington DC DOT, C2SMARTER and Kistler.

Item under Consideration:
Amend Handbook 44, adding new Section 2.26. Weigh-in-Motion Systems Used for Vehicle Direct Enforcement as follows:

Table of Contents

Section 2.26 Weigh-In-Motion Systems Used for Vehicle Direct Enforcement

A. Application

A.1. General. – This code only applies to systems installed in a fixed location used to weigh vehicles, while in motion, for the purpose of direct enforcement of legal weight limits.

A.2. Exception. – This code does not apply to weighing systems intended for the collection of statistical traffic data and weighing systems used for the purpose of screening and sorting the vehicles based on the vehicle weight to determine if a static weighment is necessary. (Also see Section 2.25. Weigh-In-Motion Systems Used for Vehicle Enforcement Screening – Tentative Code)

A.3. Additional Code Requirements. – In addition to the requirements of this code, weigh-in-motion systems shall meet the requirements of Section 1.10. General Code.

S. Specifications

S.1. Design of Indicating and Recording Elements and of Recorded Representations.

S.1.1. Ready Indication. – The system shall provide a means of verifying that the system is operational and ready for use.

S.1.2. Value of System Division Units. – The value of a system division "d" expressed in a unit of weight shall be equal to:

(a) 1, 2, or 5; or

(b) a decimal multiple or submultiple of 1, 2, or 5.

Examples: divisions may be 10, 20, 50, 100; or 0.01, 0.02, 0.05; or 0.1, 0.2, 0.5, etc.

S.1.2.1. Units of Measure. – The system shall indicate weight values using only a single unit of measure.

S.1.3. Maximum Value of Division. – The value of the system division "d" weigh-in-motion (WIM) system shall not be greater than 200 kg or 500 lb.

S.1.3.1. Number of System Divisions. – The number of system divisions shall be a minimum of 50 and a maximum of 1,000.

S.1.3.2. Minimum Capacity. – The minimum capacity in system divisions shall be 10.

S.1.4. Value of Other Units of Measure.

S.1.4.1. Speed. – Vehicle speeds shall be measured in miles per hour or kilometers per hour.

S.1.4.2. Axle-Spacing (Length). – The center-to-center distance between any two successive axles shall be measured in:

(a) meters and decimal submultiples of a meter;

(b) feet and inches; or

(c) feet and decimal submultiples of a foot.

S.1.4.3. Vehicle Length. – If the system is capable of measuring the overall length of the vehicle, the length of the vehicle shall be measured in feet and/or inches, or meters.

S.1.5. Capacity Indication. – An indicating or recording element shall not display nor record any values greater than 105 % of the specified capacity of the load receiving element.

S.1.6. Identification of a Fault. – Fault conditions affecting accuracy as specified in Table T.2.3. Maintenance Tolerances shall be presented to the operator in a clear and unambiguous means. No weight

values shall be indicated or recorded when a fault condition is detected. The following fault conditions shall be identified:

(a) Vehicle speed is below the minimum or above the maximum system specified speed.

(b) The maximum number of vehicle axles as specified has been exceeded.

(c) A change in vehicle speed greater than that specified has been detected.

(d) Imbalanced weight between the left and right wheels has exceeded the specified values.

(e) Vehicle has changed lanes between or in the proximity of the first and the last sensors.

(f) Any axle or wheel, or part of each is not on the load-receiving element of the sensors.

(g) Vehicle direction of travel is not valid for the installation.

S.1.7. Recorded Representations.

S.1.7.1. Values to be Recorded. – At a minimum, the following values shall be printed and/or stored electronically for each vehicle weighment:

(a) transaction identification number;

(b) station ID;

(c) lane identification (required if more than one lane at the site has the ability to weigh a vehicle in motion);

(d) vehicle speed;

(e) number of axles;

(f) weight of each axle;

(g) identification and weight of axle groups;

(h) axle spacing;

(i) gross vehicle weight;

(j) total vehicle length;

(k) all fault conditions that occurred during the weighing of the vehicle, as identified in paragraph S.1.6. Identification of a Fault;

(l) violations, as identified in paragraph S.2.1. Violation Parameters, which occurred during the weighing of the vehicle; and

(m) time and date.

Note: Consult the specific jurisdictional legislation for additional values that may be required to issue enforcement violations. All gross vehicle, axle, and axle group weights must be printed and/or stored with the corrected values that include any necessary reductions due to the system tolerance and adopted violation thresholds. Violation thresholds may be dependent on additional items, not specified in this code.

S.1.8. Value of the Indicated and Recorded System Division. – The value of the system's division "(d)," as recorded, shall be the same as the division value indicated.

S.2. System Design Requirements.

S.2.1. Violation Parameters. – The instrument shall be capable of accepting user-entered violation parameters for the following items:

(a) single axle weight limit;

(b) axle group weight limit;

(c) gross vehicle weight limit; and

(d) bridge formula maximum.

The instrument shall display and/or record violation conditions when these parameters have been exceeded.

Note: Jurisdiction-defined weight limits for S.2.1 Violation Parameters (a) through (d) can be used to determine the violation.

S.3. Design of Weighing Elements.

S.3.1. Multiple Load-Receiving Elements. – An instrument with a single indicating or recording element, or a combination indicating-recording element, that is coupled to two or more load-receiving elements with independent weighing systems, shall be provided with means to prohibit the activation of any load-receiving element (or elements) not in use, and shall be provided with automatic means to indicate clearly and definitely which load receiving element (or elements) is in use.

S.4. Design of Weighing Devices. – WIM systems for direct enforcement of legal weight limits shall meet the requirements of this code.

S.5. Design of Balance

S.5.1. Zero-Tracking Device. – A zero-tracking device shall have a range of 4% of the system capacity and operate only when:

(a) the system is in a no-load condition;

(b) is in stable equilibrium; and

(c) the corrections are not more than 0.5 d per second

S.5.2. Totalizing Device. – WIM systems may be provided with a totalizing device for determining gross vehicle weight which operates:

(a) automatically, in which case the instrument shall be provided with a vehicle recognition device defined in S.5.3. Vehicle Recognition/Presence Device; or

(b) semi-automatically (e.g., it operates automatically following a manual command).

S.5.3. Vehicle Recognition/Presence Device. – WIM systems which are able to operate without the intervention of an operator shall be provided with a vehicle recognition device. The device shall detect the presence of a vehicle in the weigh zone and shall detect when the whole vehicle has been weighed. WIM systems shall not indicate or print the vehicle mass unless all wheel loads of the vehicle have been weighed.

S.6. Accidental Breakdown and Maladjustment. – WIM systems shall be so constructed that an accidental breakdown or maladjustment of control elements likely to disturb its correct functioning cannot take place without its effect being evident.

S.7. Marking Requirements. – In addition to the marking requirements in G-S.1. Identification, the system shall be marked with the following information:

(a) value of the system division "d";

(b) operational temperature limits;

(c) number of instrumented lanes (not required if only one lane is instrumented);

(d) minimum and maximum vehicle speed;

(e) maximum number of axles per vehicle;

(f) maximum change in vehicle speed during weighment;

(g) minimum and maximum load;

(h) any restrictions specified in the NTEP Certificate of Conformance; and

(i) accuracy class.

S.7.1. Location of Marking Information. – The marking information required in Section 1.10. General Code, G-S.1. Identification and S.7. Marking Requirements shall be visible after installation. The information shall be marked on the system or recalled from an information screen.

N. Notes

N.1. Test Procedures.

N.1.1. Selection of Test Vehicles. – All dynamic testing associated with the procedures described in each of the subparagraphs of N.1.6 Test Procedures shall be performed with vehicles of these three types, at a minimum.

(a) a two-axle, six-tire, single-unit truck or Federal Highway Administration (FHWA) Class 5; that is, a vehicle with two axles with the rear axle having dual wheels;

(b) a three-axle, single-unit truck or FHWA Class 6; and

(c) a five-axle, single-trailer truck or FHWA Class 9 (3S2 Type).

(d) The gross vehicle weights shall be as stated in N.1.2.2. Dynamic Test Loads.

Note 1: Consideration should be made for testing the system using vehicles which are typical to the roadway in which the system is installed if different than the types listed in (a) through (c) above.

Note 2: If the WIM system will be used to enforce the weight limit for vehicles with liquid loads, a vehicle with a liquid load shall be included in the selection of test vehicles.

N.1.1.1. Weighing of Test Vehicles. – All test vehicles shall be weighed statically on a reference scale, meeting the requirements of Appendix A, before being used to conduct dynamic tests.

N.1.1.2. Determining Reference Weights for Axles, Axle Groups, and Gross Vehicle Weight. – The reference weights shall be the average weight value of a minimum of three static weighments of all single axles, axle groups, and gross vehicle weight on a reference scale before being used to conduct the dynamic tests.

Note: The axles within an axle group are not considered single axles.

N.1.2. Test Loads.

N.1.2.1. Static Test Loads. – All static test loads shall use certified test weights.

N.1.2.2. Dynamic Test Loads. – Test vehicles used for dynamic testing shall be loaded as specified below. Except when testing for liquid loads, the "load" shall be non-shifting and shall be positioned to present as close as possible, an equal side-to-side load.

(a) a half load condition (60-80% of the legal load limit of the test vehicle) for a minimum of 10 runs per test vehicle type;

(b) a full load condition (> 90% of the legal load limit for the test vehicle) for a minimum of 20 runs per test vehicle type; and

(c) When it is anticipated that a system will be used to enforce weight limits for vehicles that may be unloaded, e.g., an unloaded Class 9 vehicle crossing a bridge with a 20 TN maximum capacity, tests shall include unloaded vehicles as part of the test load.

N.1.3. Reference Scale. – Each reference vehicle shall be weighed statically on a multiple platform vehicle scale, an axle-load scale, portable axle-load weighers, or wheel-load weighers.

The scale shall be tested prior to use to establish reference test loads and shall meet the applicable NIST Handbook 44 tolerances. The official with statutory authority has the discretion to establish the location of the reference scale and timeframe in which it shall be tested.

N.1.3.1. Multi-Independent Platform Vehicle Scale System. – When using a multi-independent platform vehicle scale system, the three individual weighing/load receiving elements shall be of such dimension and spacing to facilitate the single-draft weighing of all reference test vehicles;

(a) the simultaneous weighing of each single axle and axle group of the reference test vehicles on different individual elements of the scale; and

(b) gross vehicle weight determined by summing the values of the different reference axle and reference axle groups of a test vehicle.

N.1.3.2. Axle-Load Scale. – When using an axle-load scale, each individual axle or axle group of the reference test vehicle shall be measured on the axle-load scale. Only one single axle or axle group for measurement shall be on the single platform, while other single axles or axle groups shall be off the platform. The gross vehicle weight shall be determined by summing all the single axles and axle groups.

N.1.3.3. Portable Axle-Load Weighers.

(a) When using a single portable axle-load weigher, each individual axle or axle group of the reference test vehicle shall be measured on the portable axle-load weigher. Only one single axle or axle group for measurement shall be on the weighing element of the device. The other single axles or axle groups shall not be in contact with the weighing element. The gross vehicle weight shall be determined by summing all the single axles and axle groups.

(b) When using more than a single portable axle-load weigher, each individual axle or axle group of the reference test vehicle shall be on the weighing element of a device. The gross vehicle weight shall be determined by summing all the single axles and axle groups.

N.1.3.4. Wheel-Load Weighers. – When using wheel-load weighers, each individual axle load of the reference test vehicles shall be measured on wheel-load weighers. The gross vehicle weight shall be determined by summing all axle loads.

When utilizing portable axle-load weighers or wheel-load weighers to determine the value of individual axles or axle-group loads, the reference vehicle shall be in a reasonably level position not to exceed 3 degrees or 5 % at the time of such determination.

N.1.4. Test Speeds. – All dynamic tests shall be conducted at two designated speeds.

(a) at a high speed – posted speed limit (S_{max}); and

(b) at a low speed – site-specific minimum speed, not below manufacturer's requirement (S_{min}).

N.1.5. Reference Axle Spacings. – To establish reference axle spacing, before measuring the axle spacing, the test vehicle shall be positioned straight, and the driving axle shall also be straight. A steel tape measure shall be used for measurement. Both left and right axle spacing shall be measured, and the average of two measurements shall be recorded by the nearest cm (inches). Each axle spacing shall be made by a single measurement.

N.1.6. Test Procedures.

N.1.6.1. Dynamic Load Test. – The dynamic test shall be conducted using the test vehicles defined in N.1.1. Selection of Test Vehicles and at the load condition as stated in N.1.2. Test Loads and at the speed as stated in N.1.4. Test Speeds. The number of runs shall be per Table N.1.6.

N.1.6.2. Initial Verification Test. – Initial verification tests shall be performed on any new WIM system, a WIM system at an existing direct enforcement site that has undergone major reconditioning or overhaul, or when the pavement in which the system is installed requires maintenance. At the conclusion of the dynamic test, there shall be a minimum of 20 weight readings for each single axle, axle group, and gross vehicle weight of each test vehicle. The tolerance for each weight reading shall be based on the percentage values specified in Table T.2.1. Maintenance Tolerances.

N.1.6.3. Subsequent Verification Test. – At the conclusion of the dynamic test, there shall be a minimum of 10 weight readings for each single axle, axle group, and gross vehicle weight of each test vehicle. The tolerance for each weight reading shall be based on the percentage values specified in Table T.2.3. Maintenance Tolerances.

Note. Any vehicle records identified as fault conditions listed in S.1.6. Identification of a Fault or jurisdiction defined fault conditions shall be excluded from the minimum weight readings in N.1.6.1. Dynamic Load Test.

See Table N.1.6 below to summarize the minimum number of test runs for Initial and Subsequent Verification Tests.

Table N.1.6
Minimum Number of Test Runs per Each Test Vehicle

Initial Verification Test	
Load Condition	**Speed**
Half Load (10 runs)	**High Speed S_{max} (5 runs)**
	Low Speed S_{min} (5 runs)
Full Load (20 runs)	**High Speed S_{max} (10 runs)**

Table N.1.6 Minimum Number of Test Runs per Each Test Vehicle	
Initial Verification Test	
Load Condition	**Speed**
	Low Speed S_{min} (10 runs)
Subsequent Verification Test	
Load Condition	**Speed**
Half Load (6 runs)	**High Speed S_{max} (3 runs)**
	Low Speed S_{min} (3 runs)
Full Load (10 runs)	**High Speed S_{max} (5 runs)**
	Low Speed S_{min} (5 runs)

N.1.6.4. Axle Spacing Test. – The axle spacing test is a review of the displayed and/or recorded axle spacing distance of the test vehicles. The tolerance value for each distance shall be based on the tolerance value specified in T.2.4. Tolerance Value for Axle Spacing.

T. Tolerances

T.1. Principles.

T.1.1. Design. – The tolerance for a weigh-in-motion system is a performance requirement independent of the design principle used.

T.2. Tolerance Values.

T.2.1. Acceptance Tolerance. – Acceptance tolerance shall be 50% of tolerances in Table T.2.3. Maintenance Tolerances. The acceptance tolerance shall apply to a new installation, within 30 days of a new installation being placed in service, when an existing system undergoes major reconditioning or overhaul, or during type evaluation.

T.2.2 Tests Involving Digital Indications or Representations. – To the tolerances that would otherwise be applied in paragraphs T.2.3. Tolerance Value for Dynamic Load Test, there shall be added an amount equal to one-half the value of the system division to account for the uncertainty of digital rounding.

T.2.3. Maintenance Tolerance Values for Dynamic Load Test. – The tolerance values applicable during dynamic load testing are as specified in Table T.2.3. Maintenance Tolerances based on class. See UR.1. Selection Requirements

Table T.2.3. Maintenance Tolerances		
Load Description	**Tolerance as a Percentage of Applied Test Load (Class 5)**	**Tolerance as a Percentage of Applied Test Load (Class 10)**
Gross Vehicle Weight	**± 5 %**	**± 10 %**
Axle Load	**± 10 %**	**± 20 %**
Axle Group Load (including bridge formula)	**± 8 %**	**± 15 %**

T.2.4. Tolerance Value for Axle Spacing. – The tolerance value applied to each axle spacing measurement shall be ± 0.15 m (6 inches) at 100% compliance.

T.3. Influence Factors. – The following factors are applicable to tests conducted under controlled conditions only.

T.3.1. Temperature. –The instrument shall operate within tolerance throughout the specified operational temperature range.

T.3.2. Temperature Effect on Zero-Load Balance. – The zero-load indication shall not vary by more than one division per 5°C (9°F) change in temperature.

T.3.3. Power Supply. – System shall satisfy the tolerance requirements in Table T.2.3. Maintenance Tolerances under voltage ranges of -15% to +10% of the marked nominal line voltage(s) at 60 Hz or the voltage range marked by the manufacturer at 60 Hz. The battery-operated systems shall satisfy the tolerance requirements in Table T.2.3. Maintenance Tolerances when the battery power output is not excessive or deficient.

T.4. Radio Frequency Interference (RFI) and Other Electromagnetic Interference Susceptibility. – The difference between the weight indication due to the disturbance and the weight indication without the disturbance shall not exceed the tolerance value as stated in Table T.2.3. Maintenance Tolerances.

UR. User Requirements

UR.1. Selection Requirements. – Equipment shall be suitable for the service in which it is used with respect to elements of its design, including but not limited to, its capacity, number of system divisions, value of the system division, minimum capacity, and the accuracy class. The system owner shall determine the appropriate accuracy class based on an analysis of the site per ASTM E1318, roadway maintenance capacity, legislative requirements, and manufacturer's recommendations.

UR.2. Installation and Maintenance.

UR.2.1. System Modification. – The dimensions (e.g., length, width, thickness, etc.) of the load receiving element of a system shall not be changed beyond the manufacturer's specifications, nor shall the capacity of a sensor be increased beyond its design capacity by replacing or modifying the original primary indicating or recording element with one of a higher capacity, except when the modification has been approved by a competent engineering authority, preferably that of the engineering department of the manufacturer of the system, and by the weights and measures authority having jurisdiction over the system.

UR.2.2. Foundation, Supports, and Clearance. – The foundation and supports shall be such as to provide strength, rigidity, and permanence of all components.

On load-receiving elements, which use moving parts for determining the load value, clearance shall be provided around all live parts to the extent that no contacts may result when the load-receiving element is empty, nor throughout the weighing range of the system.

UR.2.3. Access to Weighing Elements. – If necessary, adequate provision shall be made for inspection and maintenance of the weighing elements.

UR.2.4. Site Selection. - In order for any WIM system to perform properly, the user must provide and maintain an adequate operating environment for the system's sensors and instruments. This includes maintaining surface smoothness in advance of and beyond the WIM-system sensors per manufacturer's recommendation.

UR.3. Maximum Load. – A system shall not be used to weigh a load of more than the marked maximum load of the system.

UR.4. Enforcement Guidance. – Prior to the issuance of an enforcement violation, the enforcement entity shall ensure compliance with specific jurisdictional legislation and/or protocols taking into account system tolerance. All gross vehicle, axle, and axle group weights must be printed and/or stored with the corrected values that include any necessary reductions due to the system tolerance and adopted violation thresholds.

UR.5. Notification of Violation. – If a violation occurs, there shall be an audible or visual notification provided to the vehicle operator. The method used to provide notification of a violation shall be determined by the jurisdiction with authority.

Add the following definitions to Appendix D:

axle. – The axis oriented transversely to the nominal direction of vehicle motion, and extending the full width of the vehicle, about which the wheel(s) at both ends rotate. [2.26]

axle-group load. – The sum of all tire loads of the wheels on a group of adjacent axles; a portion of the gross-vehicle weight. [2.26]

axle load. – The sum of all tire loads of the wheels on an axle; a portion of the gross-vehicle weight. [2.26]

axle spacing. – The distance between the centers of any two axles. When specifying axle spacing, the axels used also need to be identified. [2.26]

weigh-in-motion (WIM). – A process of determining a moving vehicle's gross weight and the portion of that weight that is carried by each wheel, axle, or axle group, or combination thereof, by measurement and analysis of dynamic vehicle tire forces. [2.26]

WIM System. – A set of load receptors and supporting instruments that measure the presence of a moving vehicle and the related dynamic tire forces at specified locations with respect to time; determine tire loads; calculate speed, axle spacing, vehicle class according to axle arrangement, and other parameters concerning the vehicle; and process, display, store, and transmit this information. This standard applies only to highway vehicles. [2.26]

Previous Status:

2025: Voting – Returned to Committee

Original Justification:

1. INTRODUCTION

As noted in NIST Special Publication 2200-05 and according to the 2021 Fact Sheet: The Bipartisan Infrastructure Deal, one in five miles of U.S. highways and major roads and over 45,000 bridges are in poor condition. A major contributor to road damage stems from heavy or excess weight vehicles – or to be more precise – the heavy axle loads of these vehicles onto the road surface and/or pavement. As claimed by an article of Inside Science, this damage grows exponentially with the axle load of the vehicle. For comparison, a 40-ton commercial truck with 8 axles causes 625 times more road damage than a 2-ton passenger sedan with 2 axles. See Attachment B for NIST Special Publication 2200-5 for full document.

Enforcement of vehicle weight limits is typically cumbersome, requiring dedicated stations, contributing to freight and travel delays and strain on law enforcement resources. Even with the use of portable scales and virtual WIM systems, these efforts are not comprehensive, and have led to a culture where the disregard of the highway weight limits is giving an unfair economic advantage to those companies willing to risk running overweight trucks on our highways. This issue is exacerbated in our urban environments where limited space and enforcement personnel make it difficult or impossible to catch and cite these violators.

Recognizing the need for better weight limit enforcement, the New York State legislature authorized the New York City Department of Transportation (NYCDOT) in 2021 to conduct direct overweight vehicle enforcement using WIM as a demonstration program on a portion of the I-278 , connecting Brooklyn to Manhattan, Staten Island, and Queens otherwise known as the Brooklyn Queens Expressway or the BQE. The system was certified by the New York State Department of Weights and Measures using the procedure previously submitted for handbook 44 update item WIM 23.1 as developed by NYCDOT, C2SMARTand Kistler. NYCDOT provided all the logistical support and covered the cost of the testing.

In the seven months leading up to the launch of the program, a monthly average of 7,777 overweight trucks traveled this section of the roadway. During the first seven months of direct enforcement, the rate dropped to monthly average of 2,769 overweight trucks. As shown in Figure 1, the decline comes as the overall number of vehicles, including trucks, remains steady, with the share of overweight trucks falling from about 6.3 percent of all trucks on the roadway to 1.9 percent in most recent months. There have been no challenges in this time related to the accuracy of the system.

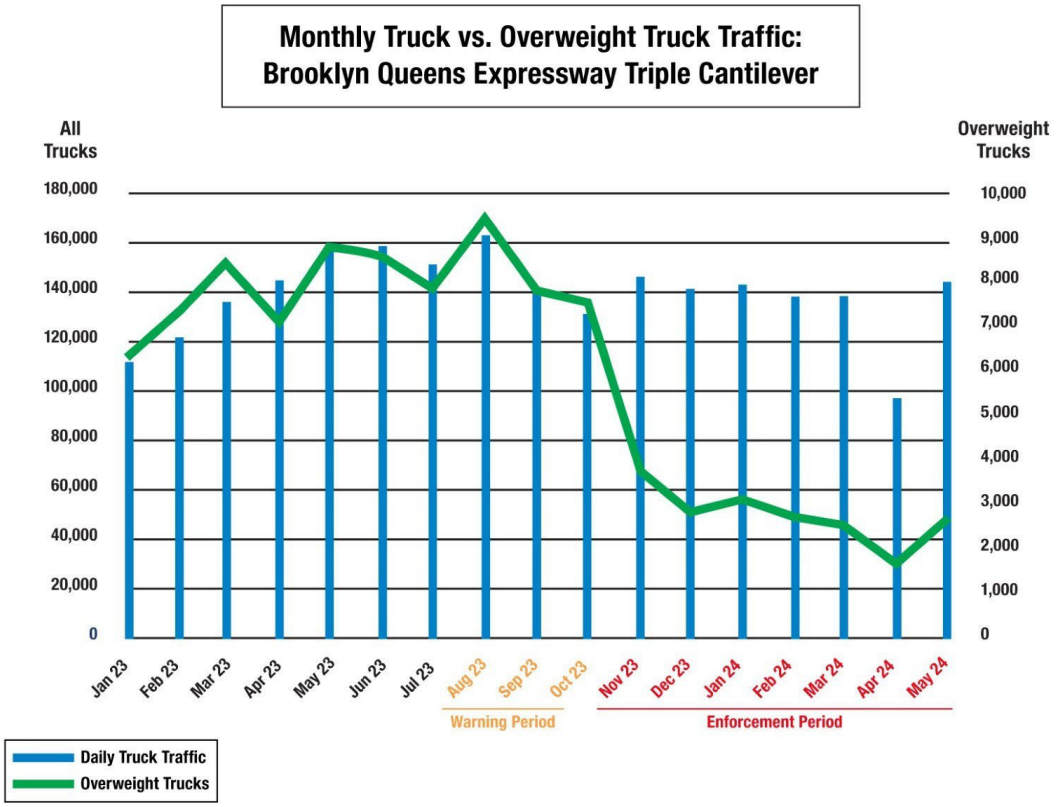

Figure 1 – Monthly Truck versus Overweight Truck Traffic on Brooklyn Queens Expressway (BQE) Triple Cantilever Structure

Since the time NYCDOT began its effort, several other states have proposed legislation for direct enforcement including Georgia and New Jersey. Several other jurisdictions are considering Direct Enforcement using WIM Systems.

The inclusion of the procedure in the handbook does not require a jurisdiction to begin direct enforcement using WIM. That authority remains with the legislative bodies of the jurisdiction. However, it is important for the proposed standard for the system to be formalized and harmonized across the nation to ensure that a unified testing protocol is being used by jurisdictions who so choose. Guarding against violations of vehicle weight restrictions to protect critical infrastructure is an issue of national concern and each jurisdiction will proceed based on local legislative authority

In addition to enforcing weight limits, officers in most States are responsible for checking Commercial Motor Vehicles (CMV's) for safety. This includes different levels of truck inspection, including the driver credentials, hours of service, key systems on the truck, load securement, and many more. Automating the weighing portion of the inspection will allow for a more efficient flow of vehicles through an inspection site and allow officers more time to focus on these other safety issues. Currently, with most sites running with a single officer, as they are focused on weighing, doing an inspection, or interviewing a driver, other unsafe vehicles behind the current one go by without scrutiny. See Attachment C Supporting Letters for letters of support from CVSA and ASCE.

This proposal seeks an amendment of NIST Handbook 44 by adding Section 2.26 to allow for Weigh-In-Motion Systems Used for Direct Vehicle Weight Enforcement certification requirements to be standardized. The remainder of this proposal lays out the justification for the amendment as well as address some of the arguments that have been raised previously in opposition, using the BQE as an example to establish the urgent need for the amendment.

2. REVIOUS PROPOSAL DATA

A similar proposal, item WIM 23.1 was voted on during the 109th Annual meeting. The original submission was made on 8/15/2022 and received a voting status at the 2024 interim meeting. However, that proposal did not receive adequate support for inclusion into HB 44.

Commenters expressed concerns of the system's tolerance and the testing procedure during open hearings that was previously considered. Previously submitted documents and comments from the regions can be found in the archives of the 108th and 109th annual meeting archives as well as 2023 and 2024 interim meeting archives. Some of the relevant documents are being attached to this submission.

During the development of the item over the time between August 2022 and voting in July 2024, all of the regions had an opportunity to review the proposal and amendments and hear from the stakeholders including the proposers in various forums. A demonstration of the proposal was also conducted in April of 2023 in Madison Wisconsin and witnessed by members of NCWM as well as NIST. In October of 2023, NYS Department of Agriculture certified the BQE site in NYC based on the proposal version of August, 2023. NYCDOT began issuing violations in November of 2023 and data related to decrease in overweight since this effort began was also shared with the council. See Attachment F 2024 Annual Meeting WIM Presentation for summary of previous data.

3. READINESS OF PROPOSAL

With the input that was gathered in the prior efforts, the current proposal has been updated to address several concerns that were raised in the process.

A. Testing Requirements: - Some jurisdictions were concerned that the testing requirements could be burdensome and lengthy. The current proposal has incorporated a potential for reduced number of runs for operational testing after the first acceptance testing is done with the larger number of runs. In addition, a test procedure guidance based on successful testing in NYC with potential ways to handle the test logistics has been attached to provide a roadmap of actual implementation. While the requirements are extensive, they are in line with belt scale testing which is included in the handbook and match international standards. Additionally, the time required is comparable to testing large belt scale installations, in-motion rail systems, and other weighing systems for materials testing where evaluating performance using materials and a reference scale is necessary.

B. Thorough Technical Review: At the Interim 2023 meeting, the previous proposal received a status of informational. This allowed close collaboration with the S&T committee as well as NIST. With this collaboration, the entire proposal was thoroughly reviewed and harmonized with other applicable sections of the Handbook 44 as well as comparable international standards like OIML. Clarifications and updates based on actual implementation in NYC have been incorporated along with the lessons learnt from the demonstration in Wisconsin.

C. Need Across the Nation: While the proposal was brought forward by NYCDOT in 2022, currently there are multiple jurisdictions who are either actively seeking legislation to move forward with Direct Enforcement or are interested in having standards made available for future efforts to obtain legislative approval. Having a national standard will ensure that jurisdictions moving forward with this approach to weight enforcement will have a better understanding of the resources needed to implement and can appropriately plan for it. In addition, while several WIM manufactures exist, without a clear standard there are varying outcomes from the systems, the industry will have clarity on expectations and can develop their products to match a recognized standard.

4. AUTOMATED TRUCK ENFORCEMENT USING WIM: ACCURACY OF WIM TECHNOLOGY VERSUS ACCEPTABLE TOLERANCE

ACCEPTABLE TOLERANCE: One of the more frequent concerns often voiced is the relatively large tolerance applied to gross vehicle weights, the axle loads, and axle-group loads. The proposal has been updated to include 2 classes of tolerance similar to the OIML standards allowing those officials charged with enforcing the regulations specific to commercial vehicles to select as appropriate based on need, site conditions, and manufacturer's recommendations.

While the tolerances proposed may seem large to the weights and measures community in comparison to commercial weighing equipment, they are non-the-less realistic and suitable for use by law enforcement. Unlike commercial vehicle scales which are installed and operated under very controlled conditions these systems are installed on interstate highways to weigh fully loaded vehicles traveling at highway speeds. The systems are continuously subject to the vibrations and stresses inherent to that environment. Unlike commercial applications where scale tolerances are made intentionally low so that they are a neglectable part of any business transaction in which the scale is used, the law enforcement official must consider the system's tolerances when issuing citations if those citations are to be upheld by a court of law. There is precedence in Handbook 44 to the idea that law enforcement scales be treated separate from commercial scales. Wheel load weighers have their own accuracy class, class IIII and weighing systems are allowed to collect and sum axle weights as an estimate of the gross vehicle weight. It is important to remember that the goal here is to protect our public roads and bridges from some of the worst offenders who are responsible for a disproportionate share of the damage to our infrastructure. Putting it another way, in a state with 80,000 lb weight limits we can risk allowing a truck weighing 85,000 lb to pass undetected if we can catch the one weighing 100,000 lbs.

Scales are evaluated not only to tolerance but to permanence. We expect them to hold their calibration for an extended period of time.

ACCURACY OF THE SYSTEM: The WIM system on the BQE has been certified multiple times and consistently met the tolerances included in the proposal. Prior to the 2nd certification, the system was tested to verify the accuracy retention over 6 months. The maximum error was 6.2%, 9.2% and 5.7% for GVW, single axle weight, and group axle weight, respectively.

The overweight enforcement system retained its accuracy over 6 months. In addition, after the system was installed but before it began to be used for direct violations at the BQE, the data from WIM was shared with NYPD in real time and then violations were issued based on portable scale weighments by the Highway Patrol. Over a span of 27 days, the NYPD enforced penalties on 48 overweight trucks, averaging less than 2 trucks per day using the more typical portable scales. The maximum GVW error was 9.2%, while the mean and average GVW errors were 0.25% and 0.05%, respectively. It should be noted that at the same time several overweight trucks identified by the WIM System could not be stopped as it took the Officers more than 2 hours to completed the inspection of each truck. No major impact was seen in the total number of overweight trucks on the corridor during this period. This is in stark contrast to the impact observed after the direct enforcement began.

Table 1 shows a summary of the data for the accuracy achieved at various sites that have applied similar WIM-based systems. The related background data is provided in Attachment D Sample WIM System Data and Attachment E Purdue WIM Report.

Table 1 – Maximum observed error for WIM-based systems collected at various sites

Sites and Testing Dates	Maximum Observed Error (%)		
	GVW	Single Axle	Group Axle
1- NY BQE Site NY PD Comparison in Mar-Apr '23	9.01%	N/A	N/A
2- NY BQE Site Validation 1 in Oct. '23	9.7%	13.1%	14.2%
3- NY BQE Site Validation 2 in Apr. '24	9.5%	19.2%	13.5%
4- WI Madison SWEF Demonstration in Apr. '23	6.4%	11.3%	7.8%
5- Indiana Study (2018)	5%*	N/A	N/A
* 5% maximum error at 95% compliance			

5. LOGISTICS OF THE TEST

The certification testing requires multiple trucks with varying loads along with drivers to complete the required number of runs. The results are then observed by the inspectors. This type of situations have already been addressed in Handbook 44 General Code, G-UR.4.4

Assistance in Testing Operations. – If the design, construction, or location of any device is such as to require a testing procedure involving special equipment or accessories or an abnormal amount of labor, such equipment, accessories, and labor shall be supplied by the owner or operator of the device as required by the weights and measures official.

As these systems are likely to be owned and operated by the state Department of Transportations, with readily available equipment and personnel to provide assistance with trucks and drivers along with traffic management should it be needed, such assistance should not be difficult to obtain for certification testing. The DOTs also have the option to contract with vendors to provide these services.

In addition, to reduce the time it would require the inspectors to test the systems, the proposal allows for reduced level of testing after the initial acceptance test has been successfully conducted. The requirements around testing and certification of reference scales have also provided jurisdictions with the ability to move forward with the option that best meets their needs based on the WIM site that is to be certified. The attached Test Procedure Guidance for WIM for Direct Enforcement Examination provides potential ways to address the logistics of the test. For reference, the demonstration runs at Wisconsin were completed in a single daytime 8 hour shift for 1 lane, while at the BQE due to traffic congestion, the test occurred during overnight single shift. Overnight testing was a site specific decision and not a requirement of the proposal. See Attachment G for Test Procedure Guidance.

6. CONCLUSIONS

Across the nation, the deterioration of aging infrastructure is exacerbated by the presence of overweight vehicles in excess of the Federal Bridge Formula (FBF). Though several states have implemented vehicle weight enforcement measures using a screening protocol that includes the use of mobile enforcement officers and stationary scales, these measures have been insufficient in significantly reducing the volumes of overweight vehicles on the nation's infrastructure. The use of WIM for the purposes of direct vehicle weight enforcement would both alleviate this problem and free up local and state resources to address other safety concerns. As noted in the attached letter from CVSA "This action correlates to a positive impact for highway safety, congestion reduction by means of an option to traditional weighing techniques especially in high traffic volume areas and acts as a force multiplier for jurisdictions facing increased traffic volumes with static weight enforcement resources. Coupled with WIM certification standards in place and accurate technology, direct WIM enforcement provides a mechanism for enabling jurisdictions to align weight compliance beyond inefficient past weight enforcement methodologies traditionally used only for screening purposes with minimal detection capability and an effective leveling of the playing field for the trucking industry."

The amendment of NIST Handbook 44 to include the attached proposal as Section 2.26 will provide a standard directly comparable to international standards. This request is not to introduce new regulations to the trucking industries but

to guide the trucking industries to comply with the existing applicable laws to protect our infrastructure, provide safe corridors to the nation's taxpayers, and improve the resilience of our built environment. Moreover, this request would allow the United States to catch up with other countries globally (shown in Figure 2) that have successfully implemented and proved automated weight enforcement, including China (2004), the Czech Republic (2010), Russia (2013), Hungary (2016), France (in process) and Brazil (in process).

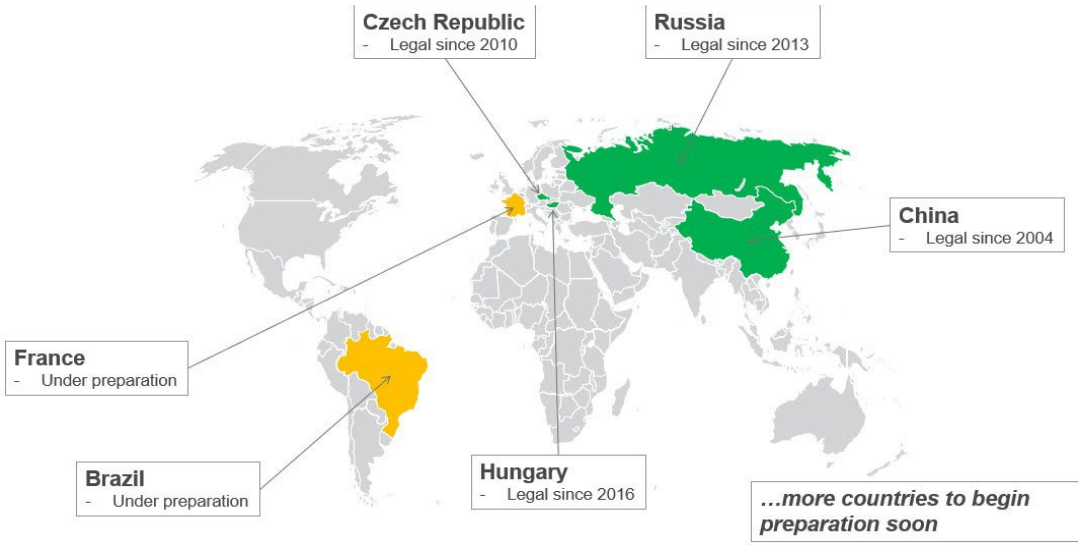

Figure 2. Automated enforcement around the world

The submitter included attachments that are available at https://www.ncwm.com/publication-15.

The submitter recommended that this be a Nonretroactive Voting item in 2025.

Comments in Favor:

Regulatory:

- 2025 Annual: Jason Flint, New Jersey Weights & Measures, who is a joint submitter of the item, stated that WIM devices are not a new concept. He noted that the screening code was brought forward by NIST in 2011, and a task group was later formed that developed updates for the scales code. He explained that the task group eventually disbanded due to a lack of data, leaving direct enforcement for the future, and that now there is supporting data. He asked everyone to keep in mind that these systems are intended for government operation to protect highway infrastructure, not the general public. He further explained that having this code in the handbook doesn't mean jurisdictions have to accept its use or can't carve out exceptions or additional requirements. He stated that jurisdictions need a uniform standard for enforcement, and this proposal provides that. He supports the item, urges its adoption, and encourages those opposed to address their concerns with their legislature.
- 2025 Annual: Steve Harrington, Oregon Department of Agriculture, who is a joint submitter of the item, stated that Oregon supports the item and echoes New Jersey. He commented that the Department of Transportation has its own authority in Oregon, they are facing budget constraints, and it is just a matter of time until there is pressure to adopt these types of requirements.
- 2025 Annual: Jim Willis, New York Department of Agriculture & Markets, who is a joint submitter of the item, stated that New York is in support of the item and desperately needs it to be adopted. He commented that it is up to legislatures to approve the devices for use in direct enforcement. He explained that his agency relies heavily on the Department of Transportation to provide vehicles and assistance in testing the devices.
- 2025 Annual: Mike Harrington, Iowa Department of Agriculture, stated that he supports the item and agrees with the comments made by New Jersey.

- 2025 Annual: Dave Rodriques, Massachusetts Division of Standards, commented in favor of the item.
- 2025 Interim: Jason Flint, New Jersey Office of Weights and Measures, who is a joint submitter of the item, stated the submitters have addressed concerns and the item is fully developed. He also noted the system is intended for law enforcement and not for commercial purposes. He recommends a Voting status.
- 2025 Interim: Jim Willis, New York State Department of Agriculture and Markets, who is a joint submitter of the item, expressed agreeance with NIST OWM. He expressed confidence in the system and that any overweight tickets issued from the system installed in New York were correct. He recommends a Voting status.
- 2025 Interim: Mike Harrington, Iowa Department of Agriculture, recommends a Voting status.
- 2025 Interim: Tory Brewer, West Virginia Weights and Measures, stated the item is fully developed but has not substantially changed from last year. He recommends a Voting status.
- 2025 Interim: Steve Harrington, Oregon Department of Agriculture, stated the item will not mandate the use of this equipment. He recommends a Voting status.

Industry:

- 2025 Annual: Tanvi Pandya (New York City Dept of Transportation) and Lukas Koch (Kistler Instrument Corp), joint submitters of the item, delivered a presentation noting that G-A.1. applies to law enforcement devices. They reviewed data from a WIM system installed in New York City in 2023, stating that 3025 violations had been issued, with only 24 dismissals, none of which were due to system accuracy questions. They explained some challenges necessitating the use of WIM systems, such as autonomous trucks and static scale installation space constraints. The presentation included a tradeoff assessment illustrating some of the advantages and disadvantages of a WIM system compared to a static scale. They also pointed out that WIM systems are currently being used for direct enforcement internationally.
- 2025 Annual: Tanvi Pandya, New York City Dept of Transportation, a joint submitter of the item, stated that the test speeds are left to the user and inspector based on the conditions, and the point is to prove it can measure the traffic at its speed. She further commented that many studies have been submitted, including one comparing the devices to a static scale.
- 2025 Interim: Tanvi Pandya, New York City DOT, delivered a presentation illustrating the changes made to the proposal to address concerns raised last year, including the addition of Class 5 and a reduced number of runs on subsequent tests. She stated that Class 5 devices are in use in Europe for enforcement and that the item will address autonomous trucks appearing this year. She stressed that these devices are intended to address grossly overweight vehicles and recommends a status of Voting.

Advisory:

- 2025 Interim: Jan Konijnenburg, NIST OWM, stated the system is suitable for its intended application and the submitters have demonstrated the need for such systems. Complete comments were submitted in the NIST OWM Technical Analysis. He stated it is fully developed and recommends a Voting status.

Comments Against:

Regulatory:

- 2025 Annual: Chad Parker, North Carolina Department of Agriculture, in response to the submitter's presentation, clarified that officials from North Carolina Weights and Measures have not met with the North Carolina Department of Transportation regarding this item, and he doesn't support the item.
- 2025 Annual: Kristin Walter, Arkansas Bureau of Standards, pointed out that one of the slides in the submitter's presentation stated that it isn't just about accuracy, yet accuracy is the main responsibility of weights and measures officials. She also explained that she had visited some WIM sites in her state and noticed that environmental variables, such as road conditions, affect the weighments. She also voiced concern with a lack of uniformity in the testing methods, such as the speed requirements, and thinks that additional data would be beneficial in proving the devices are accurate.

- 2025 Annual: Alison Wilkinson, Maryland Department of Agriculture, stated that she respects the need for the devices, but doesn't see any new data or significant changes compared to the item that failed last year. She also noted that most of the data came from other countries. She questioned whether each weighing starts with the device at zero and if the devices can meet the specifications outlined in the proposal. She stated that comments that the systems do not need to be very accurate are contrary to the principles of Handbook 44. She explained that her agency is required to test all law enforcement scales in its jurisdiction. She expressed concerns that some members have directives to vote for the item even though they disagree with it. She agrees that the item is fully developed, but she is opposed to it.
- 2025 Annual: Robert Huff, Delaware Department of Agriculture, pointed out that the proposal doesn't include a requirement for applying acceptance tolerance within 30 days of rejection and suggested referencing the General Code requirements instead of T.2.1.. He explained that his agency is required to check every scale twice per year and testing one of the systems in their jurisdiction would require a 600-mile round trip. He expressed concerns with split weighing, using the devices for liquid loads, and that their use for enforcement would result in unwarranted fines. He recommended withdrawing the item.
- 2025 Annual: Matt Douglas, California Division of Measurement Standards, stated that the item is essentially the same as last year's item and recommends withdrawing it.
- 2025 Annual: Greg Gholston, Mississippi Department of Agriculture and Commerce, stated that Mississippi remains opposed to this item. He expressed concerns that the current language in UR.4. Enforcement Guidance does not go far enough to clarify how to account for the tolerances, leaving it up to jurisdictional legislation and/or protocols to determine. He stated that he believes that deducting the applicable tolerance from the weighments must be mandatory before issuing citations.
- 2025 Annual: Maurico Mejia, Florida Department of Agriculture and Consumer Services, stated that he is opposed to the item for reasons already stated and that using a non-commercial device with such wide tolerances is not appropriate.
- 2025 Interim: Alison Wilkinson, Maryland Department of Agriculture, expressed opposition to the item and recommended the item be withdrawn. It was stated the item was reintroduced from last year and now the item is written more broadly and vague, including the examples and language. She expressed that the item does not belong in Handbook 44. She added these devices will need to be tested in Maryland, adding the complexities involved with ensuring valid, repeatable data is gathered for initial installations.
- 2025 Interim: Kristen Walter, Arkansas Bureau of Standards, questioned the accuracy of the system and the validity of notices of violations issued as it relates to the tolerance of the system. The regulator recommends a status of Withdrawn.
- 2025 Interim: Matt Douglas, California Division of Measurement Standards, agrees with comments from the regulator from the state of Maryland. As a state with the most freight commerce, he recommends a status of Withdrawn.
- 2025 Interim: Mauricio Mejia, Florida Department of Agriculture and Consumer Services, stated the item does not belong in Handbook 44. He recommends a status of Withdrawn.
- 2025 Interim: Aaron Yanker, Colorado Department of Agriculture, stated the item does not belong in Handbook 44, adding the item has not substantially changed from last year. The regulator stated concerns about infrastructure and maintenance, recommending a status of Withdrawn.
- 2025 Interim: Paul Floyd, Louisiana Department of Agriculture, questioned if this item is a weights and measures issue, particularly since the system is already being used by law enforcement. He recommends a status of Withdrawn.
- 2025 Interim: Robert Huff, Delaware Department of Agriculture, questioned the requirements to test with liquid filled test vehicles along with empty vehicles. He recommends a status of Withdrawn.

Industry:

- 2025 Annual: Jeff Cooper, National Motor Freight Traffic Association, stated that he is opposed to the item due to its lack of accuracy. He commented that he likes the technology but doesn't think we should use it until it is more accurate.
- 2025 Annual: Cory Hainy, Scale Manufacturers Association, stated that the SMA is opposed to the item due to the tolerances being too large.

- 2025 Interim: Cory Hainy, SMA, stated opposition to the item. Specific comments were provided in SMA's letter posted to the supporting documents on NCWM's website.
- 2025 Interim: Jeffrey Cooper, National Motor Freight Traffic Association, agrees with previous comments from regulators of Arkansas and Maryland. He believes the tolerances are too large and out of line with scales currently being used. He recommends a status of Withdrawn.

Advisory:
- 2025 Interim: None

Neutral Comments:

Regulatory:
- 2025 Interim: None

Industry:
- 2025 Interim: None

Advisory:
- 2025 Interim: None

Item Development:
NCWM 2025 Annual Meeting: During work sessions, for consistency with other code sections, the Committee removed the words "for Accuracy" from T.2. and corrected the references to Table T.2.3. Maintenance Tolerances in paragraphs S.1.6., T.3.3., and T.4. The Committee agrees that the handbook applies to devices used for law enforcement and recognizes the need for a standard to apply to such devices for that purpose. Recognizing that the item did not receive enough votes to pass or fail, the Committee recommends the submitters address the concerns raised. The Committee would like to hear comments from the regional meetings before assigning a status to the item.

NCWM 2025 Interim Meeting: During open hearings, the Committee Chair announced that updates to the proposal from the submitters are on the NCWM website. The Committee modified the proposal to include those updates and some additional changes, which include amending the language in paragraphs A.1. General, N.1.6.2. Initial Verification Test, and UR.1. Selection Requirements, as well as paragraph references in paragraph T.2.3. Maintenance Tolerance Values for Dynamic Load Test. The Committee believes the item is fully developed and has assigned it a Voting status.

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

During the WWMA 2025 Annual Conference the following comments were received:

Mr. Aaron Yanker (WWMA S&T Committee Chair): Updated the body to the item not having an assigned status by the NCWM S&T Committee.

As a point of clarification, this item went to vote at the 2025 NCWM Annual Conference and was returned to the 2025 NCWM S&T Committee. The 2025 NCWM S&T Committee recommended the submitters address concerns raised and requested comments from the regions before assigning a status at the 2026 NCWM Interim Conference.

Mr. Cory Hainy (Representing the SMA): SMA believes the tolerances are too large and opposes this item, recommends a Withdrawal status.

Mr. Kyle Plas (Kissler): Acknowledged he is one of the submitters of the item. Recognizes there are concerns with some specific sections of the item and open to discussion, recommends a Voting status.

Mr. Matthew Douglas (State of California, Division of Measurement Standards): Confirmed his previous comments on the item still applies and opposes the item, recommends a Withdrawal status.

Mr. Kurt Floren (Los Angeles County, California): Expressed several issues he has with the item including the exorbitant testing requirements. He also stated the 15% and 20% tolerances are too large and oppose this item. recommends a Withdrawal status.

The 2025 WWMA S&T Committee recommends that this item be assigned a Withdrawal status based on comments heard during the 2025 WWMA Annual Conference Open Hearing.

As a point of technical reference, the 2025 WWMA's review of the item as published on the 2025 WWMA S&T Agenda does not appear to reflect changes addressing concerns raised at the 2025 NCWM Annual Conference.

CWMA 2025 Interim Meeting:

Andrew Montanye – NE, opposed to this item.
Ron DePouw – WI, is generally supportive of this item for jurisdictions that need it.
Mike Harrington – IA, is supportive of this item as voting. The Handbook gives authority to states/directors to choose to not enforce, and this is a law enforcement issue and not applicable to commercial transactions.

The Committee recommends this item be given a Voting status as no changes were made since the NCWM 2025 Annual meeting.

NEWMA 2025 Interim Meeting:

Representative from VT – Feels proposal is fully developed and Recommends Voting but opposes this item. Tolerances are excessive. How class designation is assigned is unclear and potentially problematic.

Representative from NJ – Recommends voting status.

Representative from NY – Recommends voting status. Given statutory requirements for fines and penalties, the tolerances are adequate. NY plans to reduce the number of runs on subsequent certify the accuracy of these devices.

Representative from CT – Supports this item.

The committee recommends a voting status for this item.

SWMA 2025 Annual Meeting:

The 2025 SWMA S&T Committee heard the following comments:

Kiel Clasing, Kistler- co sponsor – Presentation was given and brought device samples. Recommends Voting Status.

Roy Czinku, ITS Solutions & Maintenance – Standardizing testing is very important to ensure everyone is using same standard across the board in all states. Proposal compliments existing procedures. He believes this is a necessity to preserve infrastructure and is in support of this item.

Robert Huff, Delaware – The verbiage where it states that an official has discretion is too vague and leaves it open. If this is verified – it should be used immediately prior and immediately after. If margin of error is established – "each state can determine error" He doesn't believe this should be in the handbook. Recommends Withdrawn status.

Corey Hainey, SMA – opposes item because the tolerance is too large.

Tory Brewer, West Virginia – there are a lot of variables that affect accuracy that are addressed in the handbook in other places to account. He finds it concerning that these variables are not addressed in this proposal. Recommends Withdrawn status.

Brian Terry, Arkansas – agrees with West Virginia's comments and would like clarification of the variation of when conditions are ideal versus not ideal. He doesn't agree with an inflation of tolerance due to this variation and recommends

Withdrawn status. Overcompensation of tolerance is not allowed for other devices and they have set tolerance they are required to meet.

Kiel Clasing, Kistler– While the road conditions are one factor, so is braking and acceleration. The tolerance window accounts for all of that and sets realistic thresholds to account for all.

Robert Huff, Delaware – He would like wheel load weighers removed as a verification standard

Alison Wilkinson, Maryland – opposed to this item, as currently written. Recommendations are as follows:
When using static scales as a reference standard they should be tested before and upon conclusion of testing
User requirements – maintenance tolerances should be taken into consideration when applying enforcement action.
Another recommendation is that sites are used only in enforcement when used at a site not available for static scales.

Kiel Clasing, Kistler – addresses question saying that is a policy decision to be made.

Alison Wilkinson, Maryland – Recommends adding a user requirement in the proposal that a double fine cannot be assess on the same day/same road. Only the first violation can be implemented on the same load.

The committee recommends Withdrawn status on this item based on testimony from 3 states in the region requesting the item be withdrawn.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents.

OTH-26.1 Appendix D Definitions – interference test.

Source:
NIST Office of Weights and Measures

Purpose:
This is a new proposal to define the term "interference test" and clarify how the test applies to an electric vehicle supply equipment (EVSE) system. The proposed new definition was developed to clarify the specific parameters to be examined and verified when these systems operate to indicate and record sales transactions information for the delivery of electrical energy (by the kilowatt-hour) along with time related services that are being assessed as part of an EV charging session.

Item under Consideration:
Amend NIST Handbook 44 Appendix D as follows:

interference test. – A test intended to determine the proper operation of the measuring, indicating, and recording elements of an EVSE designed to assess time fees associated with the fees for the delivery of electrical energy (by the kilowatt-hour) to an EV automatically, accurately, clearly, and separately provide all required transaction information for the sale as set forth in NIST Handbook 44 Sections 3.40 and 5.55. [5.55]

(Added 202X)

Previous Status:
New Proposal

Original Justification:
The NIST Handbook 44 General Code and other code sections require that interference tests are performed to determine if conditions such as radio frequency interference (RFI), if when verified to exist, adversely affect the performance of a device under conditions that are usual and customary for the environment and location where a device is in commercial use. The permissible tolerance between the device's performance with and without such conditions are specified in the device-specific codes or some codes will specify options such as the equipment shall clearly blank the indications, provide an error message, or be so uninterpretable as to be unusable.

In the case of two other devices (i.e., the EVSE and taximeter) their applicable codes specify there will be no interference between the measurement of time and any portion of any other parameter driving any measurement mechanism of the device. For the taximeter the other type of measurements that occur during the normal operation of the device along with time measurement is that of distance. However, the taximeter has a design feature where at the point when the vehicle reaches a threshold where the vehicle when accelerated in speed reaches the "crossover speed" then only the distance traveled is registering. The taximeter code specifies separate tolerances that apply in the direction of overregistration and underregistration for distance and time registration. In the case of the "Interference Test" for the taximeter, the device must meet a specified distance tolerance when the operation of the vehicle is at speeds where the normal conditions of operation for the taximeter were to assess fares for distance traveled in the "time on" and "time off" mode. Clearly a unique set of procedures applicable only to the taximeter.

EVSE transactions may consist of fees (fixed and/or variable) for the total kilowatt-hours of electrical energy the system delivers to an EV as well as the total amount of time and the corresponding fee that is assessed for time-related service associated with the charging of the EV's battery. Given the NIST Handbook 44 codes also include unique procedures and requirements for the implementation of an interference test, NIST OWM recommends a definition for the test that is applicable to EVSEs be included in Appendix D.

Possible Opposing Arguments: Currently NIST Handbook 44 does not include any device-specific definition(s) for the "interference test" even though the procedure is required in various code sections. The adoption of the EVSE Code and modification to the Timing Devices Code to recognize time related fees assessed by the EVSE in association with EV battery charging are relatively new to the Handbook (circa 2015), hence the test procedure is not likely being applied. Additionally, EVSEs which feature both an electrical energy and a time measuring element are not prevalent in the marketplace.

In contrast, currently the handbook code sections that cite and require an interference test are expanding and do include variations on the interference test. Therefore, the test should be clear to any sector performing an examination of a device. There are a multitude of devices in the marketplace where General Code paragraph G.N.2. Testing with Nonassociated Equipment would apply because of the device's and its associated equipment's proximity to other equipment that might generate signals that could affect the device's performance. In each case an interference test should be performed to ensure there is no disruption of normal operation or the accuracy of those devices. The interference test of an EVSE as required in paragraph N.3. Interference Test, EVSE in Code Section 5.55 Timing Devices examines operational conditions beyond environmental factors to verify the system's design. Including this newly developed device-specific definition of an EVSE interference test provides everyone with a clear uniform interpretation and application of the test.

The submitter requests Voting status in 2026.

Comments in Favor:

Regulatory:

-

Industry:

-

Advisory:

-

Comments Against:

Regulatory:

-

Industry:

-

Advisory:
-

Neutral Comments:

Regulatory:
-

Industry:
-

Advisory:
-

Item Development:
New Proposal

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

During the WWMA 2025 Annual Conference the following comments were received:

Mr. Loren Minnich (NIST Office of Weights and Measures): This item is intended to define Interference Test. Currently there is no definition, this item will add clarity to what an interference test is.

Mr. Matthew Douglas (State of California, Division of Measurement Standards): Supports a Voting status.

The 2025 WWMA S&T Committee recommends a Voting status. The committee believes the item is fully developed and ready for a vote.

CWMA 2025 Interim Meeting:

Loren Minnich – NIST OWM, commented that this adds more guidance for testing of timing devices associated with EVSE, and recommended voting status.

The Committee recommends this item be given a Voting status based on comments received during open hearing.

NEWMA 2025 Interim Meeting:

Representative from NJ –
- Interference test is explained in the Taxi Meter Code 5.54 N.3 Interference Test.
- In the Timing Device Code 5.55, it is already explicit in S.3 Interference that for EVSE, no interference between the time and electrical energy measurement elements of the system shall exist.
- In N.3 Interference Tests, EVSE., there is an explanation of the test to include no interreference between time and electrical energy measurements. If the accuracy of associated fees, indicating and recording elements are desired, as this item proposes, it should be added to this specification.
- If this definition is to exist in Appendix D - Definitions, it should read interference test, EVSE. But I would caution against defining every interreference test for every device. The parameters of the test should be included in each individual code if needed.
- Recommends developing status.

Representative from NY – Recommends developing status and including the EVSE language proposed by New Jersey.

The committee recommends a developing status for this item.

SWMA 2025 Annual Meeting:

The 2025 SWMA S&T Committee heard the following comments:

Michael Keilty, Endress+Hauser - recommends a Developing Status. He would like there to be a reference to OIML R117, which has a testing procedure for this. Proposal is blind to any other type of reference to this test and needs to be consistent. He also noticed there is minimal reference to interference in the EVSE HB 44 S.3.4 (b) code to implement this definition.

The committee recommends Developing status on this item.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents.

OTH-26.2 Appendix D Definitions – scale division, value of (d).

Source:
NIST Office of Weights and Measures

Purpose:
To update the definition of scale division to recognize electronic recorded representations.

Item under Consideration:
Amend NIST Handbook 44 Appendix D as follows:

scale division, value of (d). T**~~he value of the scale division, expressed in units of mass, is t~~**he smallest subdivision of the scale for **an** analog indication or the difference between two consecutively indicated or **~~printed~~recorded** values for **a** digital indication or **~~printing~~recorded representation, expressed in units of mass**. (Also see "verification scale division.") [2.20, 2.22]

Previous Status:
New Proposal

Original Justification:
NIST Handbook 44 was amended in 2014 and 2023 to allow recorded representations in electronic form, but this definition seems to limit the use of the scale division, d, to printed receipts. The NIST Office of Weights and Measures views this as a clean-up item. This wouldn't change the intent of the definition; it would just update it to reflect the current handbook.

It's rare that there aren't possible arguments against a proposed change, but in this case, the definition is out of date and could cause an issue with systems that issue electronic receipts.

The submitter requested Voting status in 2026.

Comments in Favor:

Regulatory:
-

Industry:
-

Advisory:
-

Comments Against:

Regulatory:
-

Industry:
-

Advisory:
-

Neutral Comments:

Regulatory:
-

Industry:
-

Advisory:
-

Item Development:
[Explain any changes made to the original proposal and committee recommendations]

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

During the WWMA 2025 Annual Conference the following comments were received:

Mr. Loren Minnich (NIST Office of Weights and Measures): This item is a "clean up", the definition of scale division seems to limit the recording of the values to printing only. This item is to allow electronic representation along with printed recorded representation.

Mr. Matthew Douglas (State of California, Division of Measurement Standards): Supports a Voting status.

The 2025 WWMA S&T Committee recommends a Voting status. The committee believes the item is fully developed and ready for a vote.

CWMA 2025 Interim Meeting:

Loren Minnich – NIST OWM, commented that this adds clarity to the definition to align with the allowance of electronic recorded representations, and recommended voting status.

The Committee recommends this item be given a Voting status based on comments received during open hearing.

NEWMA 2025 Interim Meeting:

No comments. No recommendation.

SWMA 2025 Annual Meeting:

No comments were heard.

The committee has no recommended status for this item.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents

ITEM BLOCK 1 (B1) – TRANSPORTATION-FOR-HIRE SYSTEMS

B1-TNS-25.1 V ~~Section 5.60. Transportation Network Measurement Systems – Tentative Code~~

Source:
Transportation-For-Hire Systems Task Group

Purpose:
Remove the Transportation Network Measurement Systems Tentative Code completely.

Item under Consideration:
Delete the Handbook 44, Section 5.60. Transportation Network Measurement Systems – Tentative Code as follows:

~~Table of Contents~~

Section 5.60. Transportation Network Measurement Systems – Tentative Code

This tentative code has a trial or experimental status and is not intended to be enforced. The requirements are designed for study prior to the development and adoption of a final code. Officials wanting to conduct an official examination of a device or system are advised to see paragraph G-A.3. Special and Unclassified Equipment.

(Tentative Code Added 2017)

A. Application

A.1. General. This code applies to a transportation network measurement system used in connection with a digital network that determines the actual time elapsed and/or distance travelled during a network-arranged ride to calculate a fare for transportation services.

Note: The fare is calculated by software services residing on the transportation network company servers using data transmitted by the indicating elements present in the vehicle, which are running software applications or services supplied by the transportation network company. The measurement data is generated from sources not physically connected to the vehicle (e.g., a navigation satellite system such as GPS and/or other location services).

A.2. Exceptions. This code does not apply to the following:

(a) Any system that charges a flat rate or fixed charge, and/or does not use a measurement of actual time elapsed or distance travelled to calculate a fare for transportation services.

(b) Odometers on vehicles that are rented or hired on a distance basis. (Also see Section 5.53. Odometers.)

(c) Taximeters. (Also see Section 5.54. Taximeters.)

(d) Any system where the fare is calculated by equipment located in the vehicle.

A.3. Additional Code Requirements. In addition to the requirements of this code, transportation network measurement systems shall meet the requirements of Section 1.10. General Code.

S. Specifications

S.1. Design of Indicating and Recording Elements. Indicating and recording elements shall provide indications and recorded representations that are clear, definite, accurate, and easily read under any conditions of normal operation of the device(s).

All indicating and recording elements used in a transportation network measurement system shall operate correctly while using the online-enabled technology application service provided by the transportation network company.

S.1.1. General Indicating Elements. – A transportation network measurement system shall include, as a minimum:

(a) an indicating element used by a transportation network company driver that displays information and facilitates the measurements during a network-arranged ride to calculate a fare for transportation services; and

(b) an indicating element used by a transportation network company rider that displays information that allows the rider to review the current rate(s) for the transportation service and to request a ride.

S.1.2. General Recording Elements. A transportation network measurement system shall be capable of:

~~(a) recording all information necessary to generate a receipt specified in S.1.10. Receipt;~~

~~(b) providing information to transportation network company drivers, including, but not limited to, a summary of rides given as specified in S.1.11. Driver's Summary; and~~

~~(c) providing a copy of all metrological data required by law to a weights and measures jurisdiction with statutory authority.~~

~~**S.1.3. Identification.** — All transportation network measurement system indicating elements shall display for the purposes of identification the following information:~~

~~(a) the name, initials, or trademark of the transportation network measurement system manufacturer, distributor, or developer; and~~

~~(b) the current version or revision identifier of the software application service provided by the transportation network company running on the indicating elements identified in S.1.1. General Indicating Elements.~~

~~(1) The version or revision identifier shall be prefaced by words or an abbreviation that clearly identifies the number as the required version or revision.~~

~~(2) Abbreviations for the word "Version" shall, as a minimum, begin with the letter "V" and may be followed by the word "Number." Abbreviations for the word "Revision" shall, as a minimum, begin with the letter "R" and may be followed by the word "Number." The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.).~~

~~**S.1.4. Location of Identification Information.** — The information required by S.1.3. Identification shall be accessible through an easily recognized menu and, if necessary, a submenu or other appropriate means. Examples of menu and submenu identification include, but are not limited to, "Help," "About," "System Identification," "Weights and Measures Identification," or "Identification."~~

~~**S.1.5. Display of Rates and Additional Charges**. — The transportation network measurement system shall be designed to make available to transportation network company riders the rate(s) for transportation services before the beginning of a network-arranged ride. The system shall be capable of providing an explanation of the basis for calculating a fare including, if applicable, the base fare, rates for time and distance, and the amount of a booking fee, platform fee, or other similar service fee, before a rider submits the request for a network-arranged ride.~~

~~**S.1.6. Fare Estimates.** — The transportation network measurement system shall be capable of displaying a fare estimate to the transportation network company rider before a request for a network-arranged ride is made.~~

~~**S.1.7. Actuation of Measurement System.** — Following the initiation of a network-arranged ride by the transportation network company driver, and prior to the conclusion of that network-arranged ride, the transportation network measurement system shall only indicate and/or record measurements resulting from the movement of the vehicle or by the time mechanism.~~

~~***S.1.8. Fare Adjustment.** — A transportation network measurement system shall be designed with:*~~

~~*(a) a "time off" mechanism and a "distance off" mechanism provided for the transportation network system driver to render the measurement of time and distance either operative or inoperative during the ride; or*~~

~~*(b) the capability to make post-transaction fare adjustments to reduce the amount of the fare, provided the system creates a record of all location and time data from the time the ride request was accepted by the transportation network company driver.*~~

~~*[Nonretroactive as of January 1, 2018]*~~

~~**S.1.9. Fare Identification and Other Charges.**~~

~~**S.1.9.1. Fare Identification.** Fare indications shall be identified by the word "Fare" or by an equivalent expression when displayed on the transportation network company system receipt required by S.1.10 Receipt. Values shall be defined by suitable words or monetary signs.~~

~~**S.1.9.2. Other Charges.** Other charges shall be indicated as separate line items when displayed on the receipt required by S.1.10. Receipt. Other charges shall be identified using an appropriate descriptive term, including but not limited to "Booking Fee," "Tolls," "Airport Pickup/Drop-off Surcharge" or an equivalent expression. Values shall be defined by suitable words or monetary signs.~~

~~**S.1.10. Receipt.** A transportation network measurement system shall issue a printed or electronic receipt to a transportation network company rider. This receipt shall include as a minimum the following:~~

~~(a) date of the start of the trip;~~

~~(b) unique identifying information sufficient for the transportation network company to identify the transaction, or other identifying information as specified by the statutory authority;~~

~~(c) start and end time of trip, total time of trip (maximum increment of one second), and if applicable, the total elapsed time during any time off period;~~

~~(d) distance traveled, maximum increment of 0.01 km or 0.01 mi;~~

~~(e) the associated fare in $;~~

~~(f) other charges where permitted shall be identified and itemized;~~

~~(g) total charge in $;~~

~~(h) the start and end addresses or locations of the trip;~~

~~(i) a map showing the route taken; and~~

~~(j) a means to obtain transportation network company rider assistance.~~

~~**S.1.11. Driver's Summary.** A transportation network measurement system shall be capable of providing a summary of the driver's activity regarding network arranged rides. The summary shall include, but not be limited to, the following information about each ride:~~

~~(a) date and time for start of trip;~~

~~(b) unique identifying information sufficient for the transportation network company to identify the transaction, or other identifying information as specified by the statutory authority;~~

~~(c) total time of trip, maximum increment of one second;~~

~~(d) distance traveled, maximum increment of 0.01 km or 0.01 mi;~~

~~(e) the total fare received;~~

~~(f) other charges where permitted; and~~

~~(g) a means to obtain transportation network company driver assistance.~~

~~**S.2. Provision for Sealing.**~~

S.2.1. System Security. Adequate provision shall be made to provide security for a transportation network measurement system. The system shall be designed to:

(a) protect the integrity of metrological data and algorithms used to compute fares from such data against unauthorized modification using industry standard technological protection mechanisms such as data encryption; and

(b) use software-based access controls or equivalent technological protections that limit access to metrological data and algorithms used to compute fares from such data only to authorized persons.

S.2.2. System Audit. The transportation network measurement system shall be designed in a manner that permits officials having statutory authority to verify compliance with this transportation network measurement system code.

S.2.3. Change Tracking. Changes made by the manufacturer, distributor, or developer of a transportation network measurement system to any algorithms or code, which have a metrological effect, shall be logged and recorded. The period covered by this change record is not required to exceed one year.

S.3. Provision for Trip Data Loss. If a portion of the trip data is lost due to power or signal interruption by the transportation network company driver's indicating element, the transportation network measurement system shall be capable of determining the information needed to complete any transaction in progress at the time of the power or signal loss.

S.3.1. Intermittent Trip Data Loss. – When the location services signal is lost intermittently during a prearranged ride (e.g., traveling through a tunnel), but recovered prior to the end of the ride, the transportation network measurement system shall be capable of calculating an accurate fare in accordance with T.1. Tolerance Values.

S.3.2. Significant Trip Data Loss. When the location services signal is lost for a significant portion of the network arranged ride, the transportation network measurement system shall provide for alternative fare structures.

Note: Significant trip data loss refers to instances when the location services signal is lost to the extent the transportation network measurement system is not capable of calculating an accurate fare in accordance with T.1. Tolerance Values using actual time and actual distance, or when the signal is not regained by the end of the ride.

S.3.3. Alternative Fare Structures. If the transportation network measuring system is not using actual time and actual distance for a particular trip (e.g., zone-based fares, signal loss), that portion of the fare not based on actual time and actual distance is not subject to this code. Charges not based on actual time and actual distance measurements may be based on the terms of service.

N. Notes

N.1. Distance Tests.

N.1.1. Test Methods. To determine compliance with distance tolerances, distance test(s) of a transportation network measurement system shall be conducted. The distance test(s) shall consist of a road test unless safety or other practical concerns prohibit road testing. A transfer standard test may be performed in the absence of a road test. At least one test shall be of a length sufficient to exceed the minimum fare.

N.1.1.1. Road Test. – The test consists of operating the conveyance over a precisely measured course calibrated to a traceable linear measure of at least one mile in length

N.1.1.2. Transfer Standard Test. The test consists of operating the conveyance over an unmeasured course while using a calibrated transfer standard, such as a fifth-wheel, to measure the distance travelled.

Note: Field examinations of transportation network measurement systems need not include testing of all individual devices used as driver/passenger indicating elements in connection with the service provided. It is considered sufficient that a representative sample of various indicating elements be incorporated in testing to verify proper operation of the system.

N.1.2. Test Procedures.

N.1.2.1. Test Length. All tests must be at least one mile in length. If a measured course or testing equipment is not readily available that will enable a test of a length sufficient to exceed the minimum fare, after completing the testing specified in N.1.1. Test Methods, an additional unmeasured test may be conducted. The purpose of this additional unmeasured test is to verify compliance with S.1.10. Receipt.

N.1.2.2. Additional Tests. If during testing a transportation network measurement system produces a measurement that does not comply with the tolerance values in T.1.1. Distance Tests, a minimum of three additional tests shall be conducted at the same location where all test variables are reduced to the greatest extent practicable to verify the system's ability to repeat transaction indications. Repeatability testing performed in excess of these three additional tests is done at the discretion of the official with statutory authority.

To verify system-wide noncompliance, tests for variability shall be conducted, including a minimum of three consecutive tests of varying lengths, locations, and/or environmental conditions.

N.1.3. Test Conditions.

N.1.3.1. General. Except during type evaluation, all tests shall be performed under the conditions that are considered usual and customary within the location(s) where the system is normally operated as deemed necessary by the statutory authority.

N.1.3.2. Roads. All tests shall be conducted on public roads.

N.1.3.3. Testing for Environmental Influences. During type evaluation, the distance test may include a route traveled by the vehicle that will expose the system to conditions that could contribute to the loss of, or interference with, the location service's signal. This may include:

(a) objects that may obstruct or reflect signals such as tall buildings/structures, forestation, tunnels, etc.;

(b) routes that do not follow a straight line path;

(c) significant changes in altitude; and

(d) any other relevant environmental conditions.

N.2. Time Test. A transportation network measurement system, which determines time elapsed, shall be tested for compliance with the tolerances values specified in T.1.2. Time Tests, using a certified, traceable standard.

T. Tolerances

S.4. Tolerance Values. The tolerances will be as specified in T.1.1. Distance Tests and T.1.2. Time Tests. (The following proposed tolerance values will be confirmed based on performance data evaluated by the NIST U.S. National Work Group on Taximeters before the transportation network measurement systems code becomes a permanent code.)

S.4.1. Distance Tests. Maintenance and acceptance tolerances shall be as follows:

(a) On Overregistration: 2.5

(b) On Underregistration: 2.5 %

S.4.2. Time Tests. Maintenance and acceptance tolerances shall be as follows:

(a) On Overregistration: 5 seconds or 0.5 %, whichever is greater

(b) On Underregistration: 5 seconds or 0.5 %, whichever is greater

S.5. Tests Using Transfer Standards. To the basic tolerance values that would otherwise be applied, there shall be added an amount equal to two times the standard deviation of the applicable transfer standard when compared to a basic reference standard.

UR. User Requirements

UR.1. System Indications. The indicating elements identified in S.1.1. General Indicating Elements shall display indications and information in a manner such that they can be conveniently read by the user of the device, computer, website, or online-enabled technology application service.

UR.1.1. Statement of Rates. The transportation network company rider shall be able to view the basis for calculating the fare including, if applicable, the base fare, rates for time and distance, and the amount of a booking fee, platform fee, or other similar service fees.

UR.2. Change Tracking. Upon request by an official having statutory authority, the transportation network company shall provide an explanation of changes that are logged pursuant to S.2.3. Change Tracking requirement during the time period covered by the request. Any such request shall be answered within two business days, unless extended by the official having statutory authority. Records provided pursuant to S.2.3. Change Tracking shall be treated as confidential and proprietary to the extent permitted by any applicable law.

UR.3. System Installation and Operation. The transportation network company driver shall use the indicating elements identified in S.1.1.(a) General Indicating Elements in accordance with the requirements of the manufacturer, distributor, or developer.

UR.4. Fare Estimates. Estimates for fare charges shall be provided by the transportation network measurement system when requested by the transportation network company rider and following the input of a final destination for the trip being requested. The recipient of the fare estimate shall be able to access information about the fare estimate, including key variables that may lead to discrepancies between actual fare charged and the fare estimate provided as required by law.

UR.5. Determination of Total Charges When Location Service Data Is Lost. At the conclusion of the trip, the transportation network company shall disclose to the transportation network measurement service rider and driver the manner in which total charges are determined when there is significant data loss from location services.

Appendix D.

Definitions D

digital network. An online enabled technology application service, website, or system offered or used by a transportation network company that enables a transportation network company rider to arrange a network arranged ride with a transportation network company driver. [5.60]

N

network arranged ride. The provision of transportation by a transportation network company driver to a transportation network company rider, or other persons selected by the transportation network company rider, arranged through a digital network. [5.60]

T

~~**transportation network company.** – An entity that uses a digital network to connect transportation network company riders with transportation network company drivers who provide network-arranged rides, and offers or provides a transportation network measurement system, subject to an agreement or terms of service between the transportation network company and transportation network company rider or driver. [5.60]~~

~~**transportation network company driver.** – An individual authorized by the transportation network company to access the digital network and receive connections to transportation network company riders for the purpose of providing network-arranged rides. [5.60]~~

~~**transportation network company rider.** – An individual who has obtained an account with a transportation network company and uses the transportation network company's digital network to connect with a transportation network company driver who can offer or provide a network-arranged ride to the transportation network company rider or other persons selected by the transportation network company rider. [5.60]~~

~~**transportation network measurement system.** – The information technology infrastructure and services offered or used by a transportation network company that receives data collected through a digital network and calculates a fare for a network-arranged ride. [5.60]~~

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

During the WWMA 2025 Annual Conference the following comments were received:

Mr. Matthew Douglas (State of California, Division of Measurement Standards): Recommends the item be assigned to the NCWM Transportation for Hire Systems Task Group, this item is not fully developed, needs repeatability testing, this is an opportunity to update the code.

The 2025 WWMA S&T Committee recommends an Assigned status. The committee is recommending this item be returned to the NCWM S&T Transportation-For-Hire Systems Task Group for further development with consideration to the comment heard during Open Hearings.

CWMA 2025 Interim Meeting:

Hearing no comments, the Committee recommends this item remain Voting.

NEWMA 2025 Interim Meeting:

The committee recommends a voting status for this item.

SWMA 2025 Annual Meeting:

No comments were heard.

The committee does not recommend changing the status of this item.

B1-TXI-25.1 V 5.54 ~~Taximeters~~ Transportation-For-Hire Systems

Source:
Transportation-For-Hire Systems Task Group

Purpose:
Add a new Transportation-For-Hire Systems Code to replace the existing Taximeter Code and Transportation Network Measurement Systems Tentative Code.

This code has been developed by the Transportation for Hire Task Group with the goal of producing a unified code that can be applied to all transportation for hire systems including traditional taximeters and app based rideshare companies.

It is based off of Section 5.54 Taximeters, which it will ideally replace. Bold and underlined portions in the submission indicate Task Group additions to the existing Taximeter Code. The Committee can decide whether a better path would be to wholly replace Section 5.54 with this item or to amend it throughout.

Item under Consideration:
Amend the Handbook 44, Section 5.54. Taximeters Code as follows:

Section 5.54. ~~Taximeters~~Transportation-for-Hire-Systems

A. Application

A.1. General. – This code applies to ~~taximeters; that is, to~~ devices **and systems** that ~~automatically~~ calculate ~~at a predetermined rate or rates and indicate~~**fare charges for transportation services when those charges are based on** the ~~charge for hire of a vehicle~~**distance traveled and/or time elapsed during the transport of passenger(s). This code applies to systems using single or multiple sources of data used to determine distance and/or time during transportation service for the purpose of calculating fees charged to passengers and/or payment for drivers.**

Except where expressly stated as applicable only to specific types of systems:

(a) the requirements for transportation-for-hire systems in this code will apply to those systems using the data input used for calculation of charges from sources that are physically connected to the vehicle, systems using data input from external sources, or a combination of these sources; and

(b) requirements in this code apply to systems that provide periodic updates of fare charges accumulated during a trip and those systems that supply a good faith estimate of the total fare charges prior to a trip.

(Amended 20XX)

A.2. Exceptions. – This code does not apply to the following:

(a) any system that charges a flat rate or fixed charge which does not use a dynamic measurement of time elapsed, or distance travelled to calculate a fare for transportation services;

~~(a)~~**(b)** odometers on vehicles that are rented **or hired** on a distance basis. (Also see Section 5.53. Code for Odometers.)

~~(b)~~**(c)** devices ~~that only display a flat rate~~ or ~~negotiated rate;~~ **systems used to determine shipping** or **freight charges.**

~~(c) Transportation Network Measurement Systems. (Also see Section 5.60. Transportation Network Measurement Systems.)~~

(Amended 1977, 2016, ~~and~~ 2017**, and 20XX**)

A.3. Additional Code Requirements. – In addition to the requirements of this code, ~~Taximeters~~**transportation-for-hire systems** shall meet the requirements of Section 1.10. General Code.

(Amended 20XX)

S. Specifications

S.1. Design of Indicating and Recording Elements. – Indicating and recording elements shall provide indications and recorded representations that are clear, definite, accurate, and easily read under any conditions of normal operation of the device(s).

For transportation-for-hire systems operating using application software provided by a transportation network company and installed on a user's computing device (i.e., transportation network measurement systems), the indicating and recording elements shall provide an appropriate digital platform (i.e., operating system) for the online-enabled application software allowing the system to operate as designed. Any additional features or functions installed on the user's indicating/recording element shall not interfere with the proper operation of the transportation-for-hire application software.

(Amended 20XX)

S.1.1. General. ~~**– A taximeter shall be equipped with a primary indicating element.**~~

(Amended 1988~~ and,~~ 2015**, and 20XX**)

S.1.1.1. For Systems Including a Built-for-Purpose Device Installed in the Vehicle. – A built-for-purpose device (e.g., taximeter) shall be equipped with a primary indicating element. The indicating element shall be installed and positioned in the vehicle so that all relevant indications are readily observable by a driver and passengers.

(Added 20XX)

S.1.1.2. For Systems Consisting of Application Software Installed on Not Built-for-Purpose Devices. – The indicating element(s) in systems for transportation network measurement systems using not built-for-purpose devices on which an application software has been installed shall operate as follows.

(a) An indicating element used by a transportation network company driver shall:

- **receive data input used to compute distance traveled and/or time elapsed;**
- **display trip information;**
- **provide a means of communications between system components; and**
- **provide a trip summary at the conclusion of all network-arranged transportation services.**

The device used by the driver shall perform only those functions necessary to facilitate transportation-for-hire service during the period of time when that service is being provided.

(b) An optional device operated by a rider or consumer shall provide the user with all required information on a rider/consumer's receipt of the transaction and may also provide a means for making payment for the transportation service.

(Added 20XX)

S.1.~~1~~2.~~.1.~~ Recording Elements, General. – A **transportation-for-hire service shall be capable of making available a** receipt ~~**providing**~~**(in printed or electronic format) including** information as required in S.1.~~9~~**10**. Recorded Representations ~~**shall be available from a taximeter or taximeter system**~~ through an integral or separate recording element for all transactions conducted.

~~***[Nonretroactive January 1, 2016]***~~

(Added 2015) **(Amended 20XX)**

S.1.~~2~~3. Advancement of Indicating Elements. – ~~**Except when a taximeter is being cleared, t**~~**T**he primary indicating and recording elements shall be susceptible of advancement only by the movement of the vehicle or by the time mechanism **except where an advancement of analog indications occurs on a taximeter when being cleared.**

(Amended 20XX)

S.1.3.1. For Systems Using a Built-for-Purpose Device Installed in the Vehicle. –

(a) *At the conclusion of a transaction (e.g., following the totalizing of all accrued charges and having a customer receipt made available), no other advancement of fare, extras, or other charges shall occur until the taximeter has been cleared.*

[Nonretroactive as of January 1, 2017]

(b) Where permitted, a flat rate or negotiated rate shall be displayed in the "fare" indicating mechanism, provided that once a flat rate or negotiated rate is entered the fare may no longer be advanced by movement of the vehicle or the time mechanism.

(Amended 1988~~ and,~~ 2016 **and 20XX**)

S.1.~~2~~3.~~1~~2. Time and Distance Mechanisms.~~ Means shall be provided on all taximeters designed to calculate fares based on a combination of time elapsed and distance traveled, to enable the vehicle operator to render the time mechanism either operative or inoperative with respect to the fare-indicating mechanism.~~ A transportation-for-hire system shall include either of the following:

~~S.1.2.2. Distance Mechanism.~~* (a)** ***~~Means shall be provided on all taximeters designed to calculate fare based on a combination of time elapsed and/or distance traveled to enable~~a "time off" mechanism and a "distance off" mechanism for *the vehicle operator to render the* ***measurement of time and/or*** *distance* ***~~mechanism either operative or~~*** *inoperative* ***~~with respect to the fare-indicating mechanism~~during a ride. Each use of these mechanisms shall be reflected in the calculation of total charges and recorded on the passenger's receipt; or***

[Nonretroactive as of January 1, ~~2020~~20XX]

(Amended 2018 **and 20XX**)

(b) for systems not equipped with a "time off" and/or "distance off" mechanism, the system shall be equipped with means to make post-transaction fare adjustments to reduce the amount of the fare, provided the system creates a record of all location and time data from the initiation of the transportation service.
(Added 20XX)

(Added 2017) **(Amended 20XX)**

S.1.~~3~~4. Visibility of Indications. – Primary indications displayed on indicating elements shall be clear, definite, accurate, and easily read under any conditions of normal operation.
(Amended 20XX)

S.1.~~3~~4.1. – ~~Taximeter~~ Indications For Built-for-Purpose Devices Installed in the Vehicle. – The indications of fare, including extras, and the mode of operation, such as "time" or "hired," shall be constantly displayed whenever the meter is in operation. All indications of passenger interest shall be easily read from a distance of 1.2 m (4 ft) under any condition of normal operation. This includes any necessary lighting, shading, or other means necessary to make displayed indications clearly visible to operator and passenger.

(Amended 1977, 1986, 1988, ~~and~~ 2017**, and 20XX**)

S.1.~~3~~4.~~2~~1.1. Minimum Height of Figures, Words, and Symbols. – The minimum height of the figures used to indicate the fare shall be 10 mm and for extras, 8 mm. The minimum height of the figures, words, or symbols used for other indications, including those used to identify or define, shall be 3.5 mm.

(Added 1986)

S.1.~~3~~4.~~3~~1.2. Passenger's Indications. *– A supplementary indicating element installed in a taxi to provide information regarding the taxi service to the passenger (i.e., Passenger Information Monitor or PIM), shall clearly display the current total of all charges incurred for the transaction. The accruing total of all charges must remain clearly visible on the passenger's display (unless disabled by the passenger) at all times during the transaction.*

[Nonretroactive as of January 1, 2016]

(Added 2015) (Amended 2017)

S.1.~~3~~4.~~3~~1.2.1. Additional Information. *– Additional information shall be displayed or made available through a passenger's indicating element (as described in S.1.~~3~~4.~~3~~1.2 Passenger's Indications) and shall be current and reflect any charges that have accrued. This additional information shall include:*

(a) an itemized account of all charges incurred including fare, extras, and other additional charges; and

(b) the rate(s) in use at which any fare is calculated.

*Any additional information made available must not obscure the accruing total of charges for the taxi service. This additional information may be made accessible through clearly identified operational controls (e.g., keypad, button, menu, **~~touch screen~~touchscreen**).*

[Nonretroactive as of January 1, 2016]

(Added 2015) **(Amended 20XX)**

S.1.~~3~~4.~~3~~1.~~2~~3. Fare and Extras Charges. *– The indication of fare and extras charges on a passenger's indicating element shall agree with similar indications displayed on all other indicating elements in the system.*

[Nonretroactive as of January 1, 2016]

(Added 2015)

S.1.~~4~~5. Actuation of Fare Indicating Mechanism. – When a **~~taximeter~~built-for-purpose device installed in the vehicle** designed to calculate fares upon the basis of a combination of distance traveled and time elapsed, but not both time and distance used concurrently to calculate fare, is operative with respect to fare indication, the fare indicating mechanism shall be actuated by the distance mechanism whenever the vehicle is in motion at such a speed that the rate of distance revenue equals or exceeds the time rate, and may be actuated by the time mechanism whenever the vehicle speed is less than this and when the vehicle is not in motion.

(Amended 1977 **~~and~~** 2017**, and 20XX**)

S.1.~~5~~6. Operating Condition.

S.1.~~5~~6.1. General. – When a **~~taximeter~~built-for-purpose device installed in the vehicle** is cleared, the indication "Not Registering," "Vacant," or an equivalent expression shall be shown. Whenever a **~~taximeter~~built-for-purpose device installed in the vehicle** is set to register charges, it shall indicate "Registering," "Hired," or an equivalent expression and the rate at which it is set shall be automatically indicated (Rate 1 or Rate A, for example).

(Amended 1988 **and 20XX**)

S.1.~~5~~6.2. Time not Recording. – When a **~~taximeter~~built-for-purpose device installed in the vehicle** is set for fare registration with the time mechanism inoperative, it shall indicate "Time Not Recording" or an equivalent expression.

(Amended 1988 **and 20XX**)

S.1.~~5~~6.3. Distance Not Recording. *– When a **~~taximeter~~built-for-purpose device installed in the vehicle** is set for fare registration with the distance mechanism inoperative, it shall indicate "Distance Not Recording" or an equivalent expression.*

[Nonretroactive as of January 1, 2020]

(Added 2017) (Amended 2018 **and 20XX**)

S.1.~~6~~7. Fare Identification. – Fare indications shall be identified by the word "Fare" or by an equivalent expression. Values shall be defined by suitable words or monetary signs.

S.1.~~7~~8. Extras. – Extras shall be indicated as a separate item and shall not be included in the fare indication. They shall be identified by the word "Extras" or by an equivalent expression. Values shall be defined by suitable words or monetary signs. Means may be provided to totalize the fare and extras if the totalized amount returns to separate indications of fare and extras within 5 seconds or less.

(Amended 1988)

S.1.~~7~~8.1. Nonuse of Extras. – If and when **~~taximeter~~** extras are prohibited by legal authority or are discontinued by a vehicle operator, the extras mechanisms shall be rendered inoperable, or the extras indications shall be effectively obscured by permanent means.

(Amended 20XX)

S.1.~~8~~9. Protection of Indications. – All indications of fare and extras shall be protected from unauthorized alteration or manipulation.

(Amended 2015)

S.1.~~9~~10. Recorded Representation. *– A printed or electronic receipt issued from a* ***~~taximeter~~built-for-purpose device installed in the vehicle****, whether through an integral or separate recording element, shall include as a minimum, the following information when processed through the taximeter system:*

(a) date;

*(b) unique vehicle identification number, such as the medallion number, taxi number, vehicle identification number (VIN), permit number, or other identifying information as specified by the statutory authority;**

*(c) start and end time of the trip;**

*(d) distance traveled, maximum increment of 0.1 km (0.1 mi);**

(e) fare in $;

*(f) each rate at which the fare was computed and the associated fare at that rate;**

*(g) additional charges (in $) where permitted such as extras, any surcharges, telecommunication charges, and taxes shall be identified and itemized;**

*(h) total charge for service in $ (inclusive of fare, extras, and all additional charges);**

*(i) trip number, if available;***

*(j) telephone number (or other contract information) for customer assistance;** **~~and~~***

*(k) a statement of chargeable time and chargeable distance for taximeters that calculate fare using time and distance concurrently~~.~~**;***** **and***

(l) for software-based systems, the software version identification number *. (Added 20XX)***

Note: When processed through the taximeter or taximeter system, any adjustments (in $) to the total charge for service including discounts, credits, and tips shall also be included on the receipt.**

[Nonretroactive as of January 1, 1989]

**[Nonretroactive as of January 1, 2000]*

***[Nonretroactive as of January 1, 2016]*

****[Nonretroactive as of January 1, 2018]*

*******[Nonretroactive as of January 1, 20XX]***

(Added 1988) (Amended 1999, 2015, ~~and~~ 2017**, and 20XX**)

S.1.~~9~~10.1. Multiple Recorded Representations - Duplicate Receipts. *– A recording element may produce a duplicate receipt for the previous transaction provided the information printed is identical to the original with the exception of time issued. The duplicate receipt shall include the words "duplicate" or "copy." The feature to print a duplicate receipt shall be deactivated at the time the meter is hired for the next fare.*

[Nonretroactive as of January 1, 2000]

(Added 1999)

S.1.~~10~~11. Non-fare Information. *– The fare and extras displays may be used to display auxiliary information, provided the meter is in the ~~,~~Vacant condition, and such information is only displayed for10 seconds, or less. If the information consists of a list of information, the list may be displayed one item after another, provided that each item is displayed for 10 seconds, or less.*

[Nonretroactive as of January 1, 2002]

(Added 2000) **(Amended 20XX)**

S.1.12. Electronic Receipt Required. – An electronic receipt shall be provided to the customer from software and application-based meters, when the payment transaction is completed electronically via the businesses application or software program.

(Added 20XX)

S.2. Basis of Fare Calculations. – A ~~taximeter~~**transportation-for-hire system** shall calculate fares only upon the basis of:

(a) distance traveled;

(b) time elapsed; or

(c) a combination of distance traveled and time elapsed.

A ~~taximeter~~**transportation-for-hire system** may utilize more than one rate to calculate the fare during a trip. Any change in the applied rate must occur at the completion of the current interval.

(Amended 1977~~ and,~~ 2016**, and 20XX**)

S.2.1. Initial Time and Distance Intervals. – The time and distance intervals of a ~~taximeter~~**built-for-purpose device installed in the vehicle** that does not calculate fares based on distance traveled and time elapsed used concurrently shall be directly proportional as expressed in the following formula:

$$\frac{Seconds\ of\ Initial\ Time\ Interval}{Seconds\ per\ Non-Initial\ Time\ Interval} = \frac{Distance\ of\ Initial\ Mileage\ Interval}{Distance\ per\ Non-Initial\ Mileage\ Interval}$$

(Added 1990) (Amended 2017)

S.3. Design of Operating Control.

S.3.1. Positions of Control. – The several positions of the operating controls shall be clearly defined and shall be so constructed that accidental or inadvertent changing of the operating condition of the ~~taximeter~~**built-for-purpose device installed in the vehicle** is improbable. Movement of the operating controls to an operating position immediately following movement to the cleared position shall be delayed enough to permit the ~~taximeter~~**device's display** to come to a complete rest in the cleared position.

(Amended 1988 **and 20XX**)

S.3.2. Control for Extras Mechanism. – The knob, handle, or other means provided to actuate the extras mechanism shall be inoperable whenever the ~~taximeter~~**built-for-purpose device installed in the vehicle** is cleared. **(Amended 20XX)**

S.4. Interference. – The design of a ~~taximeter~~**built-for-purpose device installed in the vehicle** shall be such that when a fare is calculated by using time and/or by using distance (but not used concurrently) there will be no interference between the time and the distance portions of the mechanism device at any speed of operation.

(Amended 1977, 1988, ~~and~~ 2017**, and 20XX**)

S.5. Provision for Security Seals. – Adequate provision shall be made for an approved means of security (e.g., data change audit trail) or physically applying security seals in such a manner that requires the security seal to be broken before an adjustment or interchange can be made of:

(a) any metrological parameter affecting the metrological integrity of the ~~taximeter~~**transportation-for-hire systems** and associated equipment; or

(b) any metrological parameter controlled by software residing in the ~~taximeter~~**built-for-purpose device installed in the vehicle** or an associated external computer network.

When applicable, the adjusting mechanism shall be readily accessible for ~~purposes~~**the purpose** of affixing a security seal.

(Audit trails shall use the format set forth in Table S.5. Categories of Device and Methods of Sealing)

(Amended 1988, 2000, ~~and~~ 2017**, and 20XX**)

Table S.5.

Categories of Device and Methods of Sealing

Categories of Device	***Methods of Sealing***
Category 1: *No remote configuration capability.*	*Seal by physical seal or* ~~*two event counters: one*~~**,** *for* ~~*calibration parameters*~~***components that may be removed from the vehicle, a combination of physical seals*** *and* ~~*one for configuration parameters*~~***a physical or electronic link as described in S.5.2. Taximeters Calibrated to Specific Vehicles****.*
Category 2: *Remote configuration capability, but access is controlled by physical hardware.* *The device shall clearly indicate that it is in the remote configuration mode and record such message if capable of printing in this mode. The device shall not operate as normal when in the remote configuration mode.*	*The hardware enabling access for remote access to calibration functions must be at the device and sealed using a physical seal and the device shall include an event logger.* *An event logger must be used to record changes to configuration parameters made through remote access.* *The event logger must include event counters (000 to 999 with a minimum count of 1000 events), the parameter ID, the date and time of the change, and the new value of the parameter. A printed or electronic copy of the information must be available through the device. The event logger shall have a capacity to retain records equal to 10 times the number of sealable parameters in the device, but not more than 1000 records are required.* *(Note: Does not require 1000 changes to be stored for each parameter.*

Table S.5. *Categories of Device and Methods of Sealing*	
Category 3: *Remote configuration capability access may be unlimited or controlled through a software switch (e.g., password).* *The device shall clearly indicate that it is in the remote configuration mode and record such message if capable of printing in this mode. The device shall not operate as normal when in the remote configuration mode.*	*An event logger must be used to record changes to adjustable parameters that are made through remote access, and which is accessible only by authorized persons (using an Internet web browser or other such secure software.* *The event logger shall include event counters, the date and time of the change, the parameter ID, and the new value of the parameter. A printed or electronic copy of the information must be available through the device. The event loggers shall have a capacity to retain records equal to 10 times the number of sealable parameters in the device, but not more than 1000 records are required.* *(Note: Does not require 1000 change to be stored for each parameter.)* *The device shall become inoperable when access to the system's metrological parameters is made through unapproved or unauthorized means. The device shall remain inoperable until cleared by the official having statutory authority.*

[Nonretroactive as of January 1, 2018]

(Table Added 2017) (Amended 2022 **and 20XX**)

S.5.1. Taximeter Connected to Networked Systems. – Metrological features that are not located on the taximeter device installed in the vehicle (i.e., accessed through a computer network, server, or "cloud") shall be secured by means that will:

(a) protect the integrity of metrological data and algorithms used to compute fares from such data against unauthorized modifications; and

(b) use software-based access controls or equivalent technological protections that limit access to metrological data and algorithms used to compute fares from such data only to authorized persons.

(Added 2017)

S.5.2. Taximeters Calibrated to Specific Vehicles. – In the case of taximeters where the proper performance and calibration of the device has been verified when used in a specific vehicle and which may be removed from the vehicle (e.g., slide mounting the taximeter), means shall be provided through a physical seal or electronic link between components affecting accuracy or indications of the device to ensure that its performance is not affected and operation is permitted only with those components having the same unique properties.

(Added 2017)

S.6. Power Interruption, Electronic Taximeters.

(a) After a power interruption of three seconds or less, the fare and extras indications shall return to the previously displayed indications and may be susceptible to advancement without the taximeter being cleared.

(b) After a power interruption exceeding three seconds, the fare and extras indications shall return to the previously displayed indications and shall not be susceptible to advancement until the taximeter is cleared.

*After restoration of power following an interruption exceeding three seconds, the previously displayed fare shall be displayed for a maximum of one minute at which time the fare shall automatically clear, and the taximeter shall return to the vacant condition.**

*[*Nonretroactive as of January 1, 2002]*

(Added 1988) (Amended 1989, 1990, and 2000)

S.7. Measurement Signal Loss. – If the measurement signal is interrupted, the taximeter shall be capable of determining any information needed to complete a transaction in progress at the time of signal loss/interruption.

Note: If the meter ceases to increment fare based on distance, the taximeter may continue to increment fare based on elapsed time provided the time mechanism is not affected by signal loss.

(Added 2017)

S.7.1. Intermittent Trip Data Loss. – When the measurement signal is lost intermittently during a trip (e.g., traveling through a tunnel), but recovered prior to the end of the trip, the taximeter shall be capable of calculating an accurate fare in accordance with T.1. Tolerance Values.

(Added 2017)

S.7.2. Significant Trip Data Loss. – When the signal is lost for a significant portion of the trip, the taximeter shall calculate the total charge utilizing recorded time and distance measurements and other charges (e.g., tolls and airport fees), and may also include other means in accordance with the terms of service (or other agreement) the passenger has agreed to.

Note: Significant trip data loss refers to instances when the measurement signal is lost to the extent that the taximeter cannot perform an accurate measurement or when the signal is not regained by the end of the trip.

(Added 2017)

S.8. Anti-Fraud Provisions, Electronic Taximeters. – An electronic taximeter may have provisions to detect and eliminate distance input that is inconsistent with the taximeter's source(s) of distance measurement data. When a taximeter equipped with this feature detects input inconsistent with the distance measurement data source(s):

(a) the meter shall either filter out the inconsistent distance input signals or cease to increment fare based on distance until the distance input signal is restored to normal operation. If the meter ceases to increment fare based on distance, the taximeter may continue to increment fare based on elapsed time when (1) permitted by the statutory authority; and (2) the time mechanism is not affected by inconsistent signals;

(b) the taximeter shall provide a visible or audible signal that inconsistent input signals are being detected; and

(c) the taximeter shall record the occurrence in an event logger. The event logger shall include an event counter, the date, and the time of at least the last 1000 occurrences.

(Added 2001) (Amended 2017)

N. Notes

N.1. Distance Tests.

N.1.1. Test Methods. – To determine compliance with distance tolerances, a distance test of a taximeter 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 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 device, or by computation from rolling circumference and wheel turn data.

*Simulated-road testing is not appropriate for taximeters using measurement data from sources other than signal(s) generated by rotation of the wheels of the vehicle.

Note: Field examinations of transportation network measurement systems need not include testing of all individual devices used as driver/passenger indicating elements in connection with the service provided. It is considered sufficient that a representative sample of various indicating elements be incorporated in testing to verify proper operation of the system.

(Amended 1977 ~~and~~ 2017**, and 20XX**)

N.1.2. Test Procedures. – The distance test of a taximeter, whether a road test, a simulated road test, or a fifth wheel test, shall include at least duplicate runs of sufficient length to cover at least the third money drop or 1 mi, whichever is greater, and shall be at a speed approximating the average speed traveled by the vehicle in normal service. In the case of metric calibrated taximeters, the test should cover at least the third money drop or 2 km, whichever is greater.

(Amended 1977)

N.1.2.1. Taximeters Using Measurement Data Sources from Other Than Rotation of the Wheels.

N.1.2.1.1. Testing, General. – Testing of taximeters with metrologically significant parameters that do not completely reside within the taximeter device shall include tests performed under variable conditions to verify that any non-compliant issue is generated from a network system rather than a single taximeter device. The variability tests shall include a minimum of three consecutive tests of varying lengths, locations, and/or ~~environment~~**environmental** conditions.

(Added 2017) **(Amended 20XX)**

N.1.2.1.2. Repeatability Testing, Taximeters Using Measurement Data Sources From Other Than Rotation of the Wheels. – Repeatability testing shall be conducted if, during testing, a taximeter registers a distance measurement that does not comply with the tolerance values in T.1.1. Distance Tests. A minimum of three additional tests shall be conducted at the same location and where all test variables are reduced to the greatest extent practicable to verify the system's ability to repeat transaction indications. Repeatability testing performed in excess of these three additional tests is done at the discretion of the official with statutory authority.

(Added 2017)

N.1.3. Test Conditions.

N.1.3.1. Measurement Data Based on the Rotation of the Vehicle's Wheels. – For taximeters that receive input of measurement data generated (directly or indirectly) from rotation of the vehicle's wheels, the test of the taximeter shall be performed under the following conditions.

(Added 2017)

N.1.3.1.1. Vehicle Lading. – During the distance test of a taximeter, the vehicle shall carry two persons, or in the case of a simulated road test, 70 kg or 150 lb of test weights may be substituted in lieu of the second person.

N.1.3.1.2. Tire Pressure. – At the completion of 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 taximeter.

(Amended 1977)

N.1.3.2. Taximeters Using Other Measurement Data Sources. – Except during type evaluation, all tests shall be performed under conditions that are considered usual and customary for the location(s) where the system is normally operated and as deemed necessary by the statutory authority.
(Added 2017)

N.1.3.2.1. Testing for Environmental Influences. – During type evaluation, the distance test may be performed on a route traveled by the vehicle that exposes the system to conditions possibly contributing to the loss of, or interference with, the signal(s) providing measurement data. This may include:

(a) objects that may obstruct or reflect signals such as tall buildings/structures, forestation, tunnels, etc.;

(b) routes that do not follow a straight-line path;

(c) significant changes in altitude; and

(d) any other relevant environmental conditions.
(Added 2017)

N.2. Time Test. – If a taximeter is equipped with a timing device through which charges are made for time intervals, the timer shall be tested at the initial interval, four separate subsequent intervals, and an average time test of at least four consecutive subsequent time intervals.
(Amended 1988)

N.3. Interference Test. – For taximeters that calculate fares based on time and/or distance but not simultaneously, a test shall be conducted to determine whether there is interference between the time and distance elements. During the interference test, the vehicle's operating speed shall be 3 km/h or 4 km/h (2 mi/h or 3 mi/h) faster, and then 3 km/h or 4 km/h (2 mi/h or 3 mi/h) slower than the speed at which the basic distance rate equals the basic time rate. The basic rate per hour divided by the basic rate per mile is the speed (km/h or mi/h) at which the basic time rate and basic distance rate are equal.

Note: Performance of the interference test may not be considered appropriate as a field test while travelling in a vehicle equipped with a taximeter. This test may be performed during type evaluation under controlled conditions for practicality and for safety concerns.
(Amended 1988 and 2017)

T. Tolerances

T.1. Tolerance Values.

T.1.1. On Distance Tests. – Maintenance and acceptance tolerances for taximeters shall be as follows:

(a) On Overregistration: 1 % of the interval under test.

(b) On Underregistration: 4 % of the interval under test, with an added tolerance of 30 m or 100 ft whenever the initial interval is included in the interval under test.

T.1.2. On Time Tests.

T.1.2.1. On Individual Time Intervals. – Maintenance and acceptance tolerances on individual time intervals shall be as follows:

(a) On Overregistration: 3 seconds per minute (5 %).

(b) On Underregistration: 9 seconds per minute (15 %) on the initial interval, and 6 seconds per minute (10 %) on subsequent intervals.

T.1.2.2. On Average Time Interval Computed After the Initial Interval. – Except for the initial interval, maintenance and acceptance tolerances on the average time interval shall be as follows:

(a) On Overregistration: 0.2 second per minute (0.33 %).

(b) On Underregistration: 3 seconds per minute (5 %).

(Amended 1991)

T.1.3. On Interference Tests. – For taximeters designed to calculate fares upon the basis of a combination of distance traveled and time elapsed (but not using both simultaneously), the distance registration of a taximeter in the "time on" position shall agree within 1 % of its distance registration in the "time off" position.

(Added 1988) (Amended 2017)

T.2. Tests Using Transfer Standards. – To the basic tolerance values that would otherwise be applied, there shall be added an amount equal to two times the standard deviation of the applicable transfer standard (i.e., fifth wheel) when compared to the basic reference standard.

(Added 2017)

UR. User Requirements

UR.1. Inflation of Vehicle Tires. – For taximeters that receive input of measurement data generated (directly or indirectly) from rotation of the vehicle's wheels, the operational tire pressure of passenger vehicles and truck tires shall be posted in the vehicle and shall be maintained at the posted pressure.

(Amended 1977 and 2017)

UR.2. Position and Illumination of Taximeter. – A taximeter shall be so positioned and illuminated that its indications, operational markings, and controls of passenger interest can be conveniently read by a passenger seated in a position of up to 1.2 m (4 ft) away from the taximeter under any condition of normal operation.

Note: Software and application-based systems are exempt from this user requirement if all transaction related information is readily accessible, clear, and verifiable by customers through their digital interface.

(Amended 1985, 1986, ~~and~~ 2017**, and 20XX**)

UR.3. Statement of Rates. – The distance and time rates for which a taximeter is set, including the initial distance interval and the initial time interval, the local tax rate, and the schedule of extras when an extras indication is provided shall be conspicuously displayed inside the front and rear passenger compartments. The words "Rate," "Rates," or "Rates of Fare" shall precede the rate statement. The rate statement shall be fully informative, self-explanatory, and readily understandable by the ordinary passenger, and shall either be of a permanent character or be protected by glass or other suitable transparent material.

Note: Software and application-based systems are exempt from this user requirement if all transaction related information is readily accessible, clear, and verifiable by customers through their digital interface.

(Amended 1977, 1988, 1990, ~~and~~ 1999**, and 20XX**)

Previous Status:
2025: Informational

Original Justification:
A unified code is needed because these devices and systems exist across a spectrum. Traditional taxicab companies can now use fully app-based fare calculating measurement and payment systems. Some systems blend in vehicle app-based

GPS measurement systems with traditional in person ride pick-ups, while others can utilize physical metering inside the vehicle with electronic ride acquisitions.

A unified code will standardize the specifications, tolerances, test procedures, and user requirements for all types of these systems, as much as possible, bringing equity to the industry.

Comments in Favor:

Regulatory:

- 2025 Annual: Matt Douglas, California Division of Measurement Standards, commented in support of the informational status and appreciates the efforts of the task group. He stated that language in the TNS code might not apply and thinks updates to TXI code are necessary.
- 2025 Interim: Matt Douglas, California Division of Measurement Standards, stated he agrees with the intent of the item and supports the merging of the codes, but expressed concern with the way certain devices are identified. An example provided was S.1.4. It was recommended that the item be assigned a Developing status to identify and review how devices are identified throughout the item.

Industry:

- 2025 Interim: None

Advisory:

- 2025 Interim: None

Comments Against:

Regulatory:

- 2025 Interim: Kurt Floren, County of Los Angeles, CA, expressed concern with how this may impact different technologies. He recommended clarifying “built for purpose” and referenced page S&T 180, S.1.3.2., where language was struck and may not incorporate legacy taximeters.

Industry:

- 2025 Interim: None

Advisory:

- 2025 Interim: None

Neutral Comments:

Regulatory:

- 2025 Annual: Austin Sheppard, San Diego County Department of Agriculture, stated that he thinks it’s looking better, but still has questions about the scope and thinks the language is ambiguous. He commented that Sections A and B in the exemptions are confusing and need clarification.
- 2025 Interim: Austin Shepherd, San Diego County CA Department of Agriculture, recommended an Informational status. He stated there were four areas of concern that should be addressed.
    - Page S&T 189, line 22 and 31: The provisions exempt the device from a customer display if the required information can be displayed on a customer’s device. He suggested removing this provision from the proposal.
    - Page 187. line 19: The requirement for 3 additional tests for out of tolerance verification. He proposes this requirement be removed.
    - Page 187, line 1: This provides regulatory discretion in sampling devices running a single network system. He recommends defining “representative sample of various indicating elements” as this leads to several unanswered questions including, but not limited to hardware and software questions, owner responsibility (network software v. device owner).

- Page 183, line 3: Allowance for electronic receipts; he believes the code should allow for paper receipts.

Industry:

- 2025 Interim: None

Advisory:

- 2025 Annual: Mark Lovisa, Chair of the Transportation-for-Hire Systems Task Group, commented that the task group has mostly decided to stick with the current language with some additional clarifications, such as adding a footnote to clarify built for purpose devices. He noted that the representative sample of indicating elements is up to the local jurisdiction and determined by the software version and type of device.
- 2025 Interim: Mark Lovisa, Chair of the Transportation-for-Hire Systems Task Group, updated the Committee on the progress of the group and referenced written comments he provided to the Committee. He recommended an Informational status.
- 2025 Interim: John McGuire, NIST OWM, and serving as the NIST technical advisor to the task group, recommends an Informational status for the block of items.

Item Development:

NCWM 2025 Annual Meeting: Based on some of the comments received, the Committee discussed the existing definition for "built-for-purpose device" and agrees that the item as written makes a distinction between built-for-purpose and not-built-for-purpose devices. The Committee believes the item is fully developed and has assigned it a voting status for 2026.

NCWM 2025 Interim Meeting: During open hearings, the Committee heard from several members in support of further development of the item. The Committee has assigned an Informational status to allow for further development by the task group. The Committee recommends the task group consider the questions and concerns brought up during open hearings along with those brought up in the NIST OWM Technical Analysis.

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

During the WWMA 2025 Annual Conference the following comments were received:

Mr. Matthew Douglas (State of California, Division of Measurement Standards): Recommends moving item to the TNS task group, this item is not fully developed, needs repeatability testing, this is an opportunity to update the code.

The 2025 WWMA S&T Committee recommends an Assigned status. The committee is recommending this item be returned to the NCWM S&T Transportation-For-Hire Systems Task Group for further development with consideration to the comment heard during Open Hearings

CWMA 2025 Interim Meeting:

Hearing no comments, the Committee recommends this item remain Voting.

NEWMA 2025 Interim Meeting:

The committee recommends a voting status for this item.

SWMA 2025 Annual Meeting:

No comments were heard.

The committee does not recommend changing the status of this item.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents.

ITEM BLOCK 2 (B2) – REFERENCES TO TYPE EVALUATION

Source:
NIST Office of Weights and Measures

Purpose:
To remove several paragraphs that require a device or systems to comply with NIST Handbook 44, before being submitted for NTEP evaluation.

Original Justification:
These paragraphs specify that a device must meet NIST Handbook 44 requirements before being submitted for type evaluation. These paragraphs were part of various codes when they had a tentative status but were not removed when the code was changed to permanent status.

Codes adopted prior to 1998 did not include a variation of this paragraph. The language creates a circular argument, in that a device can't be determined to comply with NIST Handbook 44 until evaluated, but the device can't be submitted for evaluation until it is determined to comply with NIST Handbook 44.

The submitter acknowledged that these paragraphs establish the responsibility of manufacturers to design devices that comply with NIST Handbook 44 requirements, and, although they are not included in each section, they should remain.

B2: CDL-26.1 ~~A.4. Type Evaluation.~~

Item under Consideration:
Amend NIST Handbook 44 Carbon Dioxide Liquid-Measuring Devices Code as follows:

~~**A.4. Type Evaluation. – The National Type Evaluation Program will accept for type evaluation only those devices that comply with all requirements of this code.**~~
~~**(Added 1998)**~~

Previous Status:
New Proposal

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

During the WWMA 2025 Annual Conference the following comments were received:

Mr. Loren Minich (NIST Office of Weights and Measures): OWM believes this item is cleanup, each code section listed has similar language that was added during the tentative status stating they must comply with HB44 before being submitted for NTEP evaluation. This section should have been removed when the codes changed to permanent status. OWM has consulted with NTEP and both believe the paragraph
can be removed. This issue is covered by NTEP administrative policy.

Mr. Matthew Douglas (State of California, Division of Measurement Standards): Acknowledged the comments from NIST OWM, supports Voting status.

Mr. Kurt Floren (Los Angeles County, California): supports Voting status.

The 2025 WWMA S&T Committee recommends that this item be assigned a Voting status based on comments and support heard during the 2025 WWMA Annual Conference Open Hearing.

CWMA 2025 Interim Meeting:

Loren Minnich – NIST OWM, commented that references to type evaluation were added to Codes when they were tentative, but not removed once the codes became permanent. No effects on the application of any Code sections. Recommends as voting.

The Committee recommends this item be given a Voting status based on comments received during open hearing.

NEWMA 2025 Interim Meeting:

The committee recommends a voting status for this item.

SWMA 2025 Annual Meeting:

The 2025 SWMA S&T Committee heard the following comments:

Alison Wilkinson, Maryland – is unsure why this item was proposed, believes it to have no merit and recommends Withdrawn status. When a developer submits their device, they should be familiar with Handbook 44 requirements and how they apply to the device to ensure the device is capable of meeting NIST HB 44 requirements. Device should be ready for evaluation upon submission and NTEP evaluators shouldn't be used as consultants.

Michael Keilty, Endress+Hauser – agrees with Alison that there isn't a need to make this modification. He doesn't believe that it is a circular argument and doesn't see the need to change the language – Recommends Developing or Withdrawn status.

The committee recommends Withdrawn status on this item.

B2: HGV-26.1 ~~A.4. Type Evaluation.~~

Item under Consideration:
Amend NIST Handbook 44 Hydrogen Gas-Measuring Devices Code as follows:

> ~~**A.4. Type Evaluation. – The National Type Evaluation Program will accept for type evaluation only those devices that comply with all requirements of this code.**~~

Previous Status:
New Proposal

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

During the WWMA 2025 Annual Conference the following comments were received:

Mr. Loren Minich (NIST Office of Weights and Measures): OWM believes this item is clean up, each code section listed has similar language that was added during the tentative status stating they must comply with HB44 before being submitted for NTEP evaluation. This section should have been removed when the codes changed to permanent status. OWM has consulted with NTEP, and both believe the paragraph can be removed. This issue is covered by NTEP administrative policy.

Mr. Matthew Douglas (State of California, Division of Measurement Standards): Acknowledged the comments from NIST OWM, supports a voting status.

Mr. Kurt Floren (Los Angeles County, California): supports Voting status.

The 2025 WWMA S&T Committee recommends that this item be assigned a Voting status based on comments and support heard during the 2025 WWMA Annual Conference Open Hearing.

CWMA 2025 Interim Meeting:

Loren Minnich – NIST OWM, commented that references to type evaluation were added to Codes when they were tentative, but not removed once the codes became permanent. No effects on the application of any Code sections. Recommends as voting.

The Committee recommends this item be given a Voting status based on comments received during open hearing.

NEWMA 2025 Interim Meeting:

The committee recommends a voting status for this item.

SWMA 2025 Annual Meeting:

The 2025 SWMA S&T Committee heard the following comments:

Alison Wilkinson, Maryland – is unsure why this item was proposed, believes it to have no merit and recommends Withdrawn status. When a developer submits their device, they should be familiar with Handbook 44 requirements and how they apply to the device to ensure the device is capable of meeting NIST HB 44 requirements. Device should be ready for evaluation upon submission and NTEP evaluators shouldn't be used as consultants.

Michael Keilty, Endress+Hauser – agrees with Alison that there isn't a need to make this modification. He doesn't believe that it is a circular argument and doesn't see the need to change the language – Recommends Developing or Withdrawn status.

The committee recommends Withdrawn status on this item.

B2: EVF-26.1 A.4. Type Evaluation.

Item under Consideration:
Amend NIST Handbook 44 Electric Vehicle Fueling Systems Code as follows:

A.4. Type Evaluation. – The National Type Evaluation Program (NTEP) will accept for type evaluation only those EVSEs that ~~**comply with all requirements of this code and**~~ have received safety certification by a nationally recognized testing laboratory **also referred to as an** ~~(~~NRTL~~)~~.

Previous Status:
New Proposal

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

During the WWMA 2025 Annual Conference the following comments were received:

Mr. Loren Minich (NIST Office of Weights and Measures): OWM believes this item is clean up, each code section listed has similar language that was added during the tentative status stating they must comply with HB44 before being submitted for NTEP evaluation. This section should have been removed when the codes changed to permanent status. OWM has consulted with NTEP, and both believe the paragraph can be removed. This issue is covered by NTEP administrative policy.

Mr. Matthew Douglas (State of California, Division of Measurement Standards): Acknowledged the comments from NIST OWM, supports a voting status.

Mr. Kurt Floren (Los Angeles County, California): supports Voting status.

The 2025 WWMA S&T Committee recommends that this item be assigned a Voting status based on comments and support heard during the 2025 WWMA Annual Conference Open Hearing.

CWMA 2025 Interim Meeting:

Loren Minnich – NIST OWM, commented that references to type evaluation were added to Codes when they were tentative, but not removed once the codes became permanent. No effects on the application of any Code sections. Recommends as voting.

The Committee recommends this item be given a Voting status based on comments received during open hearing.

NEWMA 2025 Interim Meeting:

The committee recommends a voting status for this item.

SWMA 2025 Annual Meeting:

The 2025 SWMA S&T Committee heard the following comments:

Alison Wilkinson, Maryland – is unsure why this item was proposed, believes it to have no merit and recommends Withdrawn status. When a developer submits their device, they should be familiar with Handbook 44 requirements and how they apply to the device to ensure the device is capable of meeting NIST HB 44 requirements. Device should be ready for evaluation upon submission and NTEP evaluators shouldn't be used as consultants.

Michael Keilty, Endress+Hauser – agrees with Alison that there isn't a need to make this modification. He doesn't believe that it is a circular argument and doesn't see the need to change the language – Recommends Developing or Withdrawn status.

The committee recommends Withdrawn status on this item.

B2: EMS-26.1 A.4. Type Evaluation.

Item under Consideration:
Amend NIST Handbook 44 Non-Utility Electricity-Measuring Systems Code as follows:

> A.4. Type Evaluation. – The National Type Evaluation Program (NTEP) will accept for type evaluation only those measuring systems that have received safety certification by a nationally recognized testing laboratory (also referred to as "NRTL") **~~and shall issue an NTEP Certificate of Conformance only to those measuring systems that comply with all requirements of this code.~~**

Previous Status:
New Proposal

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

During the WWMA 2025 Annual Conference the following comments were received:

Mr. Loren Minich (NIST Office of Weights and Measures): OWM believes this item is clean up, each code section listed has similar language that was added during the tentative status stating they must comply with HB44 before being submitted for NTEP evaluation. This section should have been removed when the codes changed to permanent status. OWM has consulted with NTEP, and both believe the paragraph can be removed. This issue is covered by NTEP administrative policy.

Mr. Matthew Douglas (State of California, Division of Measurement Standards): Acknowledged the comments from NIST OWM, supports a voting status.

Mr. Kurt Floren (Los Angeles County, California): supports Voting status.

The 2025 WWMA S&T Committee recommends that this item be assigned a Voting status based on comments and support heard during the 2025 WWMA Annual Conference Open Hearing.

CWMA 2025 Interim Meeting:

Loren Minnich – NIST OWM, commented that references to type evaluation were added to Codes when they were tentative, but not removed once the codes became permanent. No effects on the application of any Code sections. Recommends as voting.

The Committee recommends this item be given a Voting status based on comments received during open hearing.

NEWMA 2025 Interim Meeting:

The committee recommends a voting status for this item.

SWMA 2025 Annual Meeting:

The 2025 SWMA S&T Committee heard the following comments:

Alison Wilkinson, Maryland – is unsure why this item was proposed, believes it to have no merit and recommends Withdrawn status. When a developer submits their device, they should be familiar with Handbook 44 requirements and how they apply to the device to ensure the device is capable of meeting NIST HB 44 requirements. Device should be ready for evaluation upon submission and NTEP evaluators shouldn't be used as consultants.

Michael Keilty, Endress+Hauser – agrees with Alison that there isn't a need to make this modification. He doesn't believe that it is a circular argument and doesn't see the need to change the language – Recommends Developing or Withdrawn status.

The committee recommends Withdrawn status on this item.

B2: GMA-26.1 ~~A.3. Type Evaluation.~~

Item under Consideration:
Amend NIST Handbook 44 Non-Utility Electricity-Measuring Systems Code as follows:

> ~~**A.3. Type Evaluation. The National Type Evaluation Program (NTEP) will accept for type evaluation only those devices that comply with this code. State enforcement will be based upon the effective dates identified with each requirement when specific dates are shown.**~~

~~**(Added 1993)**~~

Previous Status:
New Proposal

Comments in Favor:

Regulatory:
•

Industry:
•

Advisory:
•

Comments Against:

Regulatory:
•

Industry:
•

Advisory:
•

Neutral Comments:

Regulatory:
•

Industry:
•

Advisory:
•

Item Development:
New Proposal.

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

During the WWMA 2025 Annual Conference the following comments were received:

Mr. Loren Minich (NIST Office of Weights and Measures): OWM believes this item is clean up, each code section listed has similar language that was added during the tentative status stating they must comply with HB44 before being submitted for NTEP evaluation. This section should have been removed when the codes changed to permanent status. OWM has consulted with NTEP, and both believe the paragraph can be removed. This issue is covered by NTEP administrative policy.

Mr. Matthew Douglas (State of California, Division of Measurement Standards): Acknowledged the comments from NIST OWM, supports a voting status.

Mr. Kurt Floren (Los Angeles County, California): supports Voting status.

The 2025 WWMA S&T Committee recommends that this item be assigned a Voting status based on comments and support heard during the 2025 WWMA Annual Conference Open Hearing.

CWMA 2025 Interim Meeting:

Loren Minnich – NIST OWM, commented that references to type evaluation were added to Codes when they were tentative, but not removed once the codes became permanent. No effects on the application of any Code sections. Recommends as voting.

The Committee recommends this item be given a Voting status based on comments received during open hearing.

NEWMA 2025 Interim Meeting:

The committee recommends a voting status for this item.

SWMA 2025 Annual Meeting:

The 2025 SWMA S&T Committee heard the following comments:

Alison Wilkinson, Maryland – is unsure why this item was proposed, believes it to have no merit and recommends Withdrawn status. When a developer submits their device, they should be familiar with Handbook 44 requirements and how they apply to the device to ensure the device is capable of meeting NIST HB 44 requirements. Device should be ready for evaluation upon submission and NTEP evaluators shouldn't be used as consultants.

Michael Keilty, Endress+Hauser – agrees with Alison that there isn't a need to make this modification. He doesn't believe that it is a circular argument and doesn't see the need to change the language – Recommends Developing or Withdrawn status.

The committee recommends Withdrawn status on this item.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents.

ITEM BLOCK 3 (B3) – METHOD OF SEALING, CATEGORY 3

Source:
Endress+hauser Flow USA Inc. and Metron

Purpose:
In 2022, HB 44 Code Section 3.30 LMD Table S.2.2 Methods of Sealing, Category 3 was amended. The purpose of this proposal is to amend the same section found in the other HB 44 Device 3.XX Code Sections with the same language.

Original Justification:
Technology has advanced in all measurement areas with the integration of electronics for measuring devices and wireless transmission.

It is not practical to have direct wired connections to measuring devices where there are multiple devices or where access is limited for safety or installation requirements.

It was shortsighted to not address this when the change was made to 3.30 LMD Table S.2.2 Methods of Sealing Category 3 back in 2022.

The proposed language enables non-wired transmission from the measuring device to another device from which the information can be printed.

The submitter acknowledged these potential arguments against:

- Do not change the other code sections Method of Sealing Category 3because the LMD code section was modified for RMFDs which are burdened if required a direct wired connection.
- Devices are not secure and could be fraudulently adjusted if wireless transmission is allowed for all measuring devices.
- Weighing devices in Code Sections 2.XX are not recognized in the proposal.

The submitter requested Voting status in 2026.

B3: VTM-26.1 Table S.2.2. Categories of Device and Methods of Sealing

Item under Consideration:
Amend NIST Handbook 44 Vehicle Tank Meters Code as follows:

Table S.2.2. ***Categories of Device and Methods of Sealing***	
Categories of Device	***Methods of Sealing***
Category 1: *No remote configuration capability.*	*Seal by physical seal or two event counters: one for calibration parameters and one for configuration parameters.*
Category 2: *Remote configuration capability, but access is controlled by physical hardware.* *The device shall clearly indicate that it is in the remote configuration mode and record such message if capable of printing in this mode or shall not operate while in this mode.*	*The hardware enabling access for remote communication must be on-site. The hardware must be sealed using a physical seal or an event counter for calibration parameters and an event counter for configuration parameters. The event counters may be located either at the individual measuring device or at the system controller; however, an adequate number of counters must be provided to monitor the calibration and configuration parameters of the individual devices at a location. If the counters are located in the system controller rather than at the individual device, means must be provided to generate a hard copy of the information through an on-site device.*
Category 3: *Remote configuration capability access may be unlimited or controlled through a software switch (e.g., password).* *The device shall clearly indicate that it is in the remote configuration mode and record such message if capable of printing in this mode or shall not operate while in this mode.*	*An event logger is required in the device; it must include an event counter (000 to 999), the parameter ID, the date and time of the change, and the new value of the parameter. A printed copy of the information must be available on demand through the device or through another on-site device~~. The information may also be available~~, or transmitted electronically. The event logger shall have a capacity to retain records equal to 10 times the number of sealable parameters in the device, but not more than 1000 records are required. (**Note:** Does not require 1000 changes to be stored for each parameter.)*

Previous Status:
New Proposal

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

During the WWMA 2025 Annual Conference the following comments were received:

Mr. Loren Minich (NIST Office of Weights and Measures): NIST OWM has not had time to evaluate this block of items thoroughly. We understand the idea of the proposal, however the LMD language should be reviewed as this language could be used as an alternative, or it could be helpful in developing this item further. The language currently as written in this item does not seem to carry out the stated purpose.

Mr. Kurt Floren (Los Angeles County, California): Spoke to concerns with the event logger. An onsite inspector should be able to review a printed copy at the time of inspection. The information may also be available electronically, but it must be available on site. The current language may allow the event log to only be available off site.

Mr. Cory Hainy (Avery Weigh-Tronix): Asked why the submitter chose to leave out weighing devices. Position on the item is neutral.

Mr. Loren Minich (NIST Office of Weights and Measures): Stated OWM did not know why scales code was not included. OWM believes this proposal is an attempt to harmonize with the LMD code. The event logger must be available at the time of inspection printed or electronically. This must be in the language.

Mr. Matthew Douglas (State of California, Division of Measurement Standards): Responding to Mr. Hainy – see additional documentation as to why 2.20 was not included. Language from 3.30 categories for sealing table code could be used: "The information may be printed by the device, printed by another on-site device, or transmitted electronically." Rather than the language as it appears in the agenda, which seems to still require a printed copy of the event logger information. Each one of these codes will need to be assessed to verify that the proposed update is applicable and appropriate and that they all reflect that this information must be produced by the device and available at the time of the inspection. If the item moves forward Recommends a Developing status.

Mr. Kurt Floren (Los Angeles County, California): Supports California DMS and OWM. Requests the committee include the LMD language as a suggestion to the submitter. The language at the time of inspection is critical language that must be included. The item should remain Developing and hear the comments from the other regions.

Mr. Scott Wagner (Colorado Division of Oil & Public Safety): Raised concern as this proposal applies to Category 3 sealing and would this language conflict with current methods particularly USB devices. The item has merit but needs additional work. Supports a Developing status.

Mr. Scott Simmons (P20:10 Services, LLC): Raised concern that the ability to use a memory stick device remains available. Supports a Developing status.

The 2025 WWMA S&T Committee recommends that this item be assigned a Developing status based on comments and testimony heard during the 2025 WWMA Annual Conference Open Hearing.

The WWMA S&T Committee recommends the submitter review the comments stated above particularly the language referenced from the LMD code and seek feedback from all stakeholders including NIST OWM and all the regional associations and its members who speak to this item.

CWMA 2025 Interim Meeting:

The Committee reviewed and considered updated language from the submitter of this block of items. This language differed from what was printed in the agenda. After the original Block 3 items were published, the NTEP Measuring Sector met and wanted to further harmonize the Category 3 Sealing language between various Codes. The updated

language from the NTEP Measuring Sector was presented to the Body during open hearing. The comments and recommendation below are based on the updated language. All supporting documents can be found on the CWMA site.

Loren Minnich – NIST OWM, commented that "may" in the proposal needs further review. This seems to move away from what was previously required. The intent is to allow electronic as an option in place of physical, but this could be interpreted to not require either method.

The Committee recommends this item, as appears below, be given a Developing status based on comments received during open hearing.

3.30 LMD Table S.2.2,

An event logger is required in the device; it must include an event counter (000 to 999), the parameter ID, the date and time of the change, and the new value of the parameter. The event logger information ~~shall~~ may be ~~available at the time of inspection either as a printed copy or in electronic format~~. provided electronically in lieu of or in addition to a hard copy at the time of inspection, provided the event logger information is retained in the system for future reference. ~~The information may be printed by the device, printed by another on-site device, or transmitted electronically.~~ The event logger shall have a capacity to retain records equal to 10 times the number of sealable parameters in the device, but not more than 1000 records are required. (Note: Does not require 1000 changes to be stored for each parameter.)

3.31 VTM Table S.2.2., 3.32 LPG&AALM Table S.2.2., 3.34 CLM Table S.2.5., 3.35 MM Table S.2.3., 3.36 WM Table S.2.1., 3.37 MFM Table S.3.5., 3.38 CDLM Table S.2.5., 3.39 HGM Table S.3.3, 3.4.1 NUEMS Table S.2.2.

An event logger is required in the device; it must include an event counter (000 to 999), the parameter ID, the date and time of the change, and the new value of the parameter. ~~A printed copy of the information must be available on demand through the device or through another on-site device. The information may also be available electronically.~~ The event logger information may be provided electronically in lieu of or in addition to a hard copy at the time of inspection, provided the event logger information is retained in the system for future reference. The event logger shall have a capacity to retain records equal to 10 times the number of sealable parameters in the device, but not more than 1000 records are required. (**Note:** Does not require 1000 changes to be stored for each parameter.)

3.40 EVFS Table S.3.3.,

An event logger is required in the device; it must include an event counter (000 to 999), the parameter ID, the date and time of the change, and the new value of the parameter. The event logger information may be provided electronically in lieu of or in addition to a hard copy at the time of inspection, provided the event logger information is retained in the system for future reference. The event logger shall have a capacity to retain records equal to 10 times the number of sealable parameters in the ~~EVSE~~ device, but not more than 1000 records are required. (**Note:** Does not require 1000 changes to be stored for each parameter.)

NEWMA 2025 Interim Meeting:

Representative from VT – Recommends these tables should be consolidated and moved to a single location in the handbook, for example the general code or in an appendix.

Representative from NJ – Explained that the event logger information should be available at the time of inspection and wasn't sure if the information is transmitted electronically would allow for this. Recommends developing status.

Updates submitted to NEWMA S&T Chair.

The committee recommends a developing status for this item.

SWMA 2025 Annual Meeting:

The 2025 SWMA S&T Committee heard the following comments:

Michael Keilty, Endress+Hauser (submitter) – questioned about Cat 3 devices – descriptions in each measuring code has disparities. LMD had the best initially, so they used it in the original proposal to recommend all are uniform.
Later, it was revised to the EVSE Cat 3 description as it is more explicit on how to provide event log information.
Materials available online – 2 submittals – a letter to Withdraw original language (using LMD language) and submit new request (using EVFS language) MS Form 15 Method of Sealing 3.40 EVFS Table S 3 3 description - edit to strike EVSE and replace with Device.
Sections to be affected to allow uniformity:
3.30 LMD Table S.2.2,
3.31 VTM Table S.2.2.,
3.32 LPG&AALM Table S.2.2.,
3.34 CLM Table S.2.5.,
3.35 MM Table S.2.3.,
3.36 WM Table S.2.1.,
3.37 MFM Table S.3.5.,
3.38 CDLM Table S.2.5.,
3.39 HGM Table S.3.3,
3.40 EVFS Table S.3.3.,
3.41 NUEMS Table S.2.2.
This proposal allows for a device to be designed so that the event log can be obtained by some format, securely
He recommends Voting Status.

Brent Price, Gilbarco – supports the item moving forward as Voting - be sure to include LMDs as part of this

Alison Wilkinson, Maryland - supports Voting status

The committee recommends Voting status on the item, as revised and with the additional editorial revision removing the extra period in 3.4.1 NUEMs, changing it to 3.41 NEUMS.

Comments apply for all Block 3 items.

S&T committee added LMD-26.2 to the addendum sheet because it was left off from the form 15 codes to be edited.

B3: LPG-26.1 Table S.2.2. Categories of Device and Methods of Sealing

Item under Consideration:
Amend NIST Handbook 44 LPG and Anhydrous Ammonia Liquid Measuring Devices Code as follows:

Table S.2.2. ***Categories of Device and Methods of Sealing***	
Categories of Device	***Methods of Sealing***
Category 1: *No remote configuration capability.*	*Seal by physical seal or two event counters: one for calibration parameters and one for configuration parameters.*
Category 2: *Remote configuration capability, but access is controlled by physical hardware.* *The device shall clearly indicate that it is in the remote configuration mode and record such message if capable of printing in this mode or shall not operate while in this mode.*	*The hardware enabling access for remote communication must be on-site. The hardware must be sealed using a physical seal or an event counter for calibration parameters and an event counter for configuration parameters. The event counters may be located either at the individual measuring device or at the system controller; however, an adequate number of counters must be provided to monitor the calibration and configuration parameters of the individual devices at a location. If the counters are located in the system controller rather than*

Table S.2.2. *Categories of Device and Methods of Sealing*	
Categories of Device	***Methods of Sealing***
	at the individual device, means must be provided to generate a hard copy of the information through an on-site device.
Category 3: *Remote configuration capability access may be unlimited or controlled through a software switch (e.g., password).* *The device shall clearly indicate that it is in the remote configuration mode and record such message if capable of printing in this mode or shall not operate while in this mode.*	*An event logger is required in the device; it must include an event counter (000 to 999), the parameter ID, the date and time of the change, and the new value of the parameter. A printed copy of the information must be available on demand through the device or through another on-site device~~. The information may also be available~~**, or transmitted** electronically. The event logger shall have a capacity to retain records equal to 10 times the number of sealable parameters in the device, but not more than 1000 records are required. (**Note:** Does not require 1000 changes to be stored for each parameter.)*

Previous Status:
New Proposal

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

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Mr. Loren Minich (NIST Office of Weights and Measures): NIST OWM has not had time to evaluate this block of items thoroughly. We understand the idea of the proposal, however the LMD language should be reviewed as this language could be used as an alternative, or it could be helpful in developing this item further. The language currently as written in this item does not seem to carry out the stated purpose.

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Mr. Cory Hainy (Avery Weigh-Tronix): Asked why the submitter chose to leave out weighing devices. Position on the item is neutral.

Mr. Loren Minich (NIST Office of Weights and Measures): Stated OWM did not know why scales code was not included. OWM believes this proposal is an attempt to harmonize with the LMD code. The event logger must be available at the time of inspection printed or electronically. This must be in the language.

Mr. Matthew Douglas (State of California, Division of Measurement Standards): Responding to Mr. Hainy – see additional documentation as to why 2.20 was not included. Language from 3.30 categories for sealing table code could be used: "The information may be printed by the device, printed by another on-site device, or transmitted electronically." Rather than the language as it appears in the agenda, which seems to still require a printed copy of the event logger information. Each one of these codes will need to be assessed to verify that the proposed update is applicable and appropriate and that they all reflect that this information must be produced by the device and available at the time of the inspection. If the item moves forward Recommends a Developing status.

Mr. Kurt Floren (Los Angeles County, California): Supports California DMS and OWM. Requests the committee include the LMD language as a suggestion to the submitter. The language at the time of inspection is critical language that must be included. The item should remain Developing and hear the comments from the other regions.

Mr. Scott Wagner (Colorado Division of Oil & Public Safety): Raised concern as this proposal applies to Category 3 sealing and would this language conflict with current methods particularly USB devices. The item has merit but needs additional work. Supports a Developing status.

Mr. Scott Simmons (P20:10 Services, LLC): Raised concern that the ability to use a memory stick device remains available. Supports a Developing status.

The 2025 WWMA S&T Committee recommends that this item be assigned a Developing status based on comments and testimony heard during the 2025 WWMA Annual Conference Open Hearing.

The WWMA S&T Committee recommends the submitter review the comments stated above particularly the language referenced from the LMD code and seek feedback from all stakeholders including NIST OWM and all the regional associations and its members who speak to this item.

CWMA 2025 Interim Meeting:

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The Committee recommends this item, as appears below, be given a Developing status based on comments received during open hearing.

3.30 LMD Table S.2.2,

An event logger is required in the device; it must include an event counter (000 to 999), the parameter ID, the date and time of the change, and the new value of the parameter. The event logger information ~~shall~~ may be ~~available at the time of inspection either as a printed copy or in electronic format~~. provided electronically in lieu of or in addition to a hard copy at the time of inspection, provided the event logger information is retained in the system for future reference. ~~The information may be printed by the device, printed by another on-site device, or transmitted electronically.~~ The event logger shall have a capacity to retain records equal to 10 times the number of sealable parameters in the device, but not more than 1000 records are required. (Note: Does not require 1000 changes to be stored for each parameter.)

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An event logger is required in the device; it must include an event counter (000 to 999), the parameter ID, the date and time of the change, and the new value of the parameter. ~~A printed copy of the information must be available on demand through the device or through another on-site device. The information may also be available electronically.~~ The event logger information may be provided electronically in lieu of or in addition to a hard copy at the time of inspection, provided the event logger information is retained in the system for future reference. The event logger shall have a capacity to retain records equal to 10 times the number of sealable parameters in the device, but not more than 1000 records are required. (**Note:** Does not require 1000 changes to be stored for each parameter.)

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NEWMA 2025 Interim Meeting:

The committee recommends a developing status for this item.

SWMA 2025 Annual Meeting:

The committee recommends voting status for this item.

B3: CLM-26.1 Table S.2.5. Categories of Device and Methods of Sealing

Item under Consideration:
Amend NIST Handbook 44 Cryogenic Liquid-Measuring Devices Code as follows:

Table S.2.5. ***Categories of Device and Methods of Sealing***	
Categories of Device	***Methods of Sealing***
Category 1: *No remote configuration capability.*	*Seal by physical seal or two event counters: one for calibration parameters and one for configuration parameters.*
Category 2: *Remote configuration capability, but access is controlled by physical hardware.* *The device shall clearly indicate that it is in the remote configuration mode and record such message if capable of printing in this mode or shall not operate while in this mode.*	*The hardware enabling access for remote communication must be on-site. The hardware must be sealed using a physical seal or an event counter for calibration parameters and an event counter for configuration parameters. The event counters may be located either at the individual measuring device or at the system controller; however, an adequate number of counters must be provided to monitor the calibration and configuration parameters of the individual devices at a location. If the counters are located in the system controller rather than at the individual device, means must be provided to generate a hard copy of the information through an on-site device.*
Category 3: *Remote configuration capability access may be unlimited or controlled through a software switch (e.g., password).* *The device shall clearly indicate that it is in the remote configuration mode and record such message if capable of printing in this mode or shall not operate while in this mode.*	*An event logger is required in the device; it must include an event counter (000 to 999), the parameter ID, the date and time of the change, and the new value of the parameter. A printed copy of the information must be available on demand through the device or through another on-site device****~~. The information may also be available~~, or transmitted*** *electronically. The event logger shall have a capacity to retain records equal to 10 times the number of sealable parameters in the device, but not more than 1000 records are required. (****Note:*** *Does not require 1000 changes to be stored for each parameter.)*

Previous Status:
New Proposal

Regional Associations' Comments:

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Mr. Kurt Floren (Los Angeles County, California): Supports California DMS and OWM. Requests the committee include the LMD language as a suggestion to the submitter. The language at the time of inspection is critical language that must be included. The item should remain Developing and hear the comments from the other regions.

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The Committee recommends this item, as appears below, be given a Developing status based on comments received during open hearing.

3.30 LMD Table S.2.2,

An event logger is required in the device; it must include an event counter (000 to 999), the parameter ID, the date and time of the change, and the new value of the parameter. The event logger information ~~shall~~ may be ~~available at the time of inspection either as a printed copy or in electronic format~~. provided electronically in lieu of or in addition to a hard copy at the time of inspection, provided the event logger information is retained in the system for future reference. ~~The information may be printed by the device, printed by another on-site device, or transmitted electronically.~~ The event logger shall have a capacity to retain records equal to 10 times the number of sealable parameters in the device, but not more than 1000 records are required. (Note: Does not require 1000 changes to be stored for each parameter.)

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NEWMA 2025 Interim Meeting:

The committee recommends a developing status for this item.

SWMA 2025 Annual Meeting:

The committee recommends voting status for this item.

B3: MLK-26.1 Table S.2.3. Categories of Device and Methods of Sealing

Item under Consideration:
Amend NIST Handbook 44 Milk Meters Code as follows:

Table S.2.3. Categories of Device and Methods of Sealing	
Categories of Device	***Methods of Sealing***
Category 1: *No remote configuration capability.*	*Seal by physical seal or two event counters: one for calibration parameters and one for configuration parameters.*
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Loren Minnich – NIST OWM, commented that "may" in the proposal needs further review. This seems to move away from what was previously required. The intent is to allow electronic as an option in place of physical, but this could be interpreted to not require either method.

The Committee recommends this item, as appears below, be given a Developing status based on comments received during open hearing.

3.30 LMD Table S.2.2,

An event logger is required in the device; it must include an event counter (000 to 999), the parameter ID, the date and time of the change, and the new value of the parameter. The event logger information ~~shall~~ may be ~~available at the time of inspection either as a printed copy or in electronic format~~. provided electronically in lieu of or in addition

to a hard copy at the time of inspection, provided the event logger information is retained in the system for future reference. ~~The information may be printed by the device, printed by another on-site device, or transmitted electronically.~~ The event logger shall have a capacity to retain records equal to 10 times the number of sealable parameters in the device, but not more than 1000 records are required. (Note: Does not require 1000 changes to be stored for each parameter.)

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NEWMA 2025 Interim Meeting:

The committee recommends a developing status for this item.

SWMA 2025 Annual Meeting:

The committee recommends voting status for this item.

B3: WTR-26.1 Table S.2.1. Categories of Device and Methods of Sealing

Item under Consideration:

Amend NIST Handbook 44 Water Meters Code as follows:

Table S.2.1. ***Categories of Device and Methods of Sealing***	
Categories of Device	***Methods of Sealing***
Category 1: *No remote configuration capability.*	*Seal by physical seal or two event counters: one for calibration parameters and one for configuration parameters.*
Category 2: *Remote configuration capability, but access is controlled by physical hardware.* *The device shall clearly indicate that it is in the remote configuration mode and record such message if capable of printing in this mode or shall not operate while in this mode.*	*The hardware enabling access for remote communication must be on-site. The hardware must be sealed using a physical seal or an event counter for calibration parameters and an event counter for configuration parameters. The event counters may be located either at the individual measuring device or at the system controller; however, an adequate number of counters must be provided to monitor the calibration and configuration parameters of the individual devices at a location. If the*

Table S.2.1. *Categories of Device and Methods of Sealing*	
Categories of Device	***Methods of Sealing***
	counters are located in the system controller rather than at the individual device, means must be provided to generate a hard copy of the information through an on-site device.
Category 3: *Remote configuration capability access may be unlimited or controlled through a software switch (e.g., password).* *The device shall clearly indicate that it is in the remote configuration mode and record such message if capable of printing in this mode or shall not operate while in this mode.*	*An event logger is required in the device; it must include an event counter (000 to 999), the parameter ID, the date and time of the change, and the new value of the parameter. A printed copy of the information must be available on demand through the device or through another on-site device~~. The information may also be available~~**, or transmitted** electronically. The event logger shall have a capacity to retain records equal to 10 times the number of sealable parameters in the device, but not more than 1000 records are required. (**Note:** Does not require 1000 changes to be stored for each parameter.)*

Previous Status:
New Proposal

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

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Mr. Kurt Floren (Los Angeles County, California): Supports California DMS and OWM. Requests the committee include the LMD language as a suggestion to the submitter. The language at the time of inspection is critical language that must be included. The item should remain Developing and hear the comments from the other regions.

Mr. Scott Wagner (Colorado Division of Oil & Public Safety): Raised concern as this proposal applies to Category 3 sealing and would this language conflict with current methods particularly USB devices. The item has merit but needs additional work. Supports a Developing status.

Mr. Scott Simmons (P20:10 Services, LLC): Raised concern that the ability to use a memory stick device remains available. Supports a Developing status.

The 2025 WWMA S&T Committee recommends that this item be assigned a Developing status based on comments and testimony heard during the 2025 WWMA Annual Conference Open Hearing.

The WWMA S&T Committee recommends the submitter review the comments stated above particularly the language referenced from the LMD code and seek feedback from all stakeholders including NIST OWM and all the regional associations and its members who speak to this item.

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An event logger is required in the device; it must include an event counter (000 to 999), the parameter ID, the date and time of the change, and the new value of the parameter. The event logger information may be provided electronically in lieu of or in addition to a hard copy at the time of inspection, provided the event logger information is retained in the system for future reference. The event logger shall have a capacity to retain records equal to 10 times the number of sealable parameters in the ~~EVSE~~ device, but not more than 1000 records are required. (**Note:** Does not require 1000 changes to be stored for each parameter.)

NEWMA 2025 Interim Meeting:

The committee recommends a developing status for this item.

SWMA 2025 Annual Meeting:

The committee recommends voting status for this item.

B3: MFM-26.1 Table S.3.5. Categories of Device and Methods of Sealing

Item under Consideration:
Amend NIST Handbook 44 Mass Flow Meters Code as follows:

Table S.3.5.
Categories of Device and Methods of Sealing

Categories of Device	***Methods of Sealing***
Category 1: *No remote configuration capability.*	*Seal by physical seal or two event counters: one for calibration parameters and one for configuration parameters.*
Category 2: *Remote configuration capability, but access is controlled by physical hardware.* *The device shall clearly indicate that it is in the remote configuration mode and record such message if capable of printing in this mode or shall not operate while in this mode.*	*The hardware enabling access for remote communication must be on-site. The hardware must be sealed using a physical seal or an event counter for calibration parameters and an event counter for configuration parameters. The event counters may be located either at the individual measuring device or at the system controller; however, an adequate number of counters must be provided to monitor the calibration and configuration parameters of the individual devices at a location. If the counters are located in the system controller rather than at the individual device, means must be provided to generate a hard copy of the information through an on-site device.*
Category 3: *Remote configuration capability access may be unlimited or controlled through a software switch (e.g., password).* *The device shall clearly indicate that it is in the remote configuration mode and record such message if capable of printing in this mode or shall not operate while in this mode.*	*An event logger is required in the device; it must include an event counter (000 to 999), the parameter ID, the date and time of the change, and the new value of the parameter. A printed copy of the information must be available on demand through the device or through another on-site device~~. The information may also be available~~, or transmitted electronically. The event logger shall have a capacity to retain records equal to 10 times the number of sealable parameters in the device, but not more than 1000 records are required. (**Note:** Does not require 1000 changes to be stored for each parameter.)*

Previous Status:
New Proposal

Regional Associations' Comments:

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Mr. Kurt Floren (Los Angeles County, California): Supports California DMS and OWM. Requests the committee include the LMD language as a suggestion to the submitter. The language at the time of inspection is critical language that must be included. The item should remain Developing and hear the comments from the other regions.

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3.30 LMD Table S.2.2,

An event logger is required in the device; it must include an event counter (000 to 999), the parameter ID, the date and time of the change, and the new value of the parameter. The event logger information ~~shall~~ may be ~~available at the time of inspection either as a printed copy or in electronic format~~. provided electronically in lieu of or in addition to a hard copy at the time of inspection, provided the event logger information is retained in the system for future reference. ~~The information may be printed by the device, printed by another on site device, or transmitted electronically.~~ The event logger shall have a capacity to retain records equal to 10 times the number of sealable parameters in the device, but not more than 1000 records are required. (Note: Does not require 1000 changes to be stored for each parameter.)

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NEWMA 2025 Interim Meeting:

The committee recommends a developing status for this item.

SWMA 2025 Annual Meeting:

The committee recommends voting status for this item.

B3: CDL-26.2 Table S.2.5. Categories of Device and Methods of Sealing

Item under Consideration:
Amend NIST Handbook 44 Carbon Dioxide Liquid-Measuring Devices Code as follows:

Table S.2.5. Categories of Device and Methods of Sealing	
Categories of Device	***Methods of Sealing***
Category 1: *No remote configuration capability.*	*Seal by physical seal or two event counters: one for calibration parameters and one for configuration parameters.*
Category 2: *Remote configuration capability, but access is controlled by physical hardware.* *The device shall clearly indicate that it is in the remote configuration mode and record such message if capable of printing in this mode or shall not operate while in this mode.*	*The hardware enabling access for remote communication must be on-site. The hardware must be sealed using a physical seal or an event counter for calibration parameters and an event counter for configuration parameters. The event counters may be located either at the individual measuring device or at the system controller; however, an adequate number of counters must be provided to monitor the calibration and configuration parameters of the individual devices at a location. If the counters are located in the system controller rather than at the individual device, means must be provided to generate a hard copy of the information through an on-site device.*
Category 3: *Remote configuration capability access may be unlimited or controlled through a software switch (e.g., password).* *The device shall clearly indicate that it is in the remote configuration mode and record such message if capable of printing in this mode or shall not operate while in this mode.*	*An event logger is required in the device; it must include an event counter (000 to 999), the parameter ID, the date and time of the change, and the new value of the parameter. A printed copy of the information must be available on demand through the device or through another on-site device****~~. The information may also be available~~, or transmitted*** *electronically. The event logger shall have a capacity to retain records equal to 10 times the number of sealable parameters in the device, but not more than 1000 records are required. (****Note:*** *Does not require 1000 changes to be stored for each parameter.)*

Previous Status:
New Proposal

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

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NEWMA 2025 Interim Meeting:

The committee recommends a developing status for this item.

SWMA 2025 Annual Meeting:

The committee recommends voting status for this item.

B3: HGM-26.1 Table S.3.3. Categories of Device and Methods of Sealing

Item under Consideration:
Amend NIST Handbook 44 Hydrogen Gas-Measuring Devices Code as follows:

Table S.3.3. ***Categories of Device and Methods of Sealing***	
Categories of Device	***Methods of Sealing***
Category 1: *No remote configuration capability.*	*Seal by physical seal or two event counters: one for calibration parameters and one for configuration parameters.*
Category 2: *Remote configuration capability, but access is controlled by physical hardware.* *The device shall clearly indicate that it is in the remote configuration mode and record such message if capable of printing in this mode or shall not operate while in this mode.*	*The hardware enabling access for remote communication must be on-site. The hardware must be sealed using a physical seal or an event counter for calibration parameters and an event counter for configuration parameters. The event counters may be located either at the individual measuring device or at the system controller; however, an adequate number of counters must be provided to monitor the calibration and configuration parameters of the individual devices at a location. If the counters are located in the system controller rather than at the individual device, means must be provided to generate a hard copy of the information through an on-site device.*
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Previous Status:
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Regional Associations' Comments:

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Mr. Scott Simmons (P20:10 Services, LLC): Raised concern that the ability to use a memory stick device remains available. Supports a Developing status.

The 2025 WWMA S&T Committee recommends that this item be assigned a Developing status based on comments and testimony heard during the 2025 WWMA Annual Conference Open Hearing.

The WWMA S&T Committee recommends the submitter review the comments stated above particularly the language referenced from the LMD code and seek feedback from all stakeholders including NIST OWM and all the regional associations and its members who speak to this item.

<u>CWMA 2025 Interim Meeting:</u>

The Committee reviewed and considered updated language from the submitter of this block of items. This language differed from what was printed in the agenda. After the original Block 3 items were published, the NTEP Measuring Sector met and wanted to further harmonize the Category 3 Sealing language between various Codes. The updated language from the NTEP Measuring Sector was presented to the Body during open hearing. The comments and recommendation below are based on the updated language. All supporting documents can be found on the CWMA site.

Loren Minnich – NIST OWM, commented that "may" in the proposal needs further review. This seems to move away from what was previously required. The intent is to allow electronic as an option in place of physical, but this could be interpreted to not require either method.

The Committee recommends this item, as appears below, be given a Developing status based on comments received during open hearing.

3.30 LMD Table S.2.2,

An event logger is required in the device; it must include an event counter (000 to 999), the parameter ID, the date and time of the change, and the new value of the parameter. The event logger information ~~shall~~ <u>may</u> be ~~available at the time of inspection either as a printed copy or in electronic format~~. <u>provided electronically in lieu of or in addition to a hard copy at the time of inspection, provided the event logger information is retained in the system for future reference</u>. ~~The information may be printed by the device, printed by another on-site device, or transmitted electronically.~~ The event logger shall have a capacity to retain records equal to 10 times the number of sealable

parameters in the device, but not more than 1000 records are required. (Note: Does not require 1000 changes to be stored for each parameter.)

3.31 VTM Table S.2.2., 3.32 LPG&AALM Table S.2.2., 3.34 CLM Table S.2.5., 3.35 MM Table S.2.3., 3.36 WM Table S.2.1., 3.37 MFM Table S.3.5., 3.38 CDLM Table S.2.5., 3.39 HGM Table S.3.3, 3.4.1 NUEMS Table S.2.2.

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3.40 EVFS Table S.3.3.,

An event logger is required in the device; it must include an event counter (000 to 999), the parameter ID, the date and time of the change, and the new value of the parameter. The event logger information may be provided electronically in lieu of or in addition to a hard copy at the time of inspection, provided the event logger information is retained in the system for future reference. The event logger shall have a capacity to retain records equal to 10 times the number of sealable parameters in the ~~EVSE~~ device, but not more than 1000 records are required. (**Note:** Does not require 1000 changes to be stored for each parameter.

NEWMA 2025 Interim Meeting:

The committee recommends a developing status for this item.

SWMA 2025 Annual Meeting:

The committee recommends voting status for this item.

B3: EVF-26.3 Table S.3.3. Categories of Device and Methods of Sealing

Item under Consideration:
Amend NIST Handbook 44 Electric Vehicle Fueling Systems Code as follows:

Table S.3.3. ***Categories of Device and Methods of Sealing***	
Categories of Device	***Methods of Sealing***
Category 1: *No remote configuration capability.*	*Seal by physical seal or two event counters: one for calibration parameters and one for configuration parameters.*
Category 2: *Remote configuration capability, but access is controlled by physical hardware.* *The device shall clearly indicate that it is in the remote configuration mode and record such message if capable of printing in this mode or shall not operate while in this mode.*	*The hardware enabling access for remote communication must be on-site. The hardware must be sealed using a physical seal or an event counter for calibration parameters and an event counter for configuration parameters. The event counters may be located either at the individual measuring device or at the system controller; however, an adequate number of counters must be provided to monitor the calibration and configuration parameters of the individual devices at a location. If the counters are located in the system controller rather than at the individual device, means must be provided to generate a hard copy of the information through an on-site device.*
Category 3: *Remote configuration capability access may be unlimited or controlled through a software switch (e.g., password).* *The device shall clearly indicate that it is in the remote configuration mode and record such message if capable of printing in this mode or shall not operate while in this mode.*	*An event logger is required in the device; it must include an event counter (000 to 999), the parameter ID, the date and time of the change, and the new value of the parameter. A printed copy of the information must be available on demand through the device or through another on-site device****~~. The information may also be available~~, or transmitted*** *electronically. The event logger shall have a capacity to retain records equal to 10 times the number of sealable parameters in the device, but not more than 1000 records are required. (****Note:*** *Does not require 1000 changes to be stored for each parameter.)*

Previous Status:
New Proposal

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

During the WWMA 2025 Annual Conference the following comments were received:

Mr. Loren Minich (NIST Office of Weights and Measures): NIST OWM has not had time to evaluate this block of items thoroughly. We understand the idea of the proposal, however the LMD language should be reviewed as this language could be used as an alternative, or it could be helpful in developing this item further. The language currently as written in this item does not seem to carry out the stated purpose.

Mr. Kurt Floren (Los Angeles County, California): Spoke to concerns with the event logger. An onsite inspector should be able to review a printed copy at the time of inspection. The information may also be available electronically, but it must be available on site. The current language may allow the event log to only be available off site.

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Mr. Matthew Douglas (State of California, Division of Measurement Standards): Responding to Mr. Hainy – see additional documentation as to why 2.20 was not included. Language from 3.30 categories for sealing table code could be used: "The information may be printed by the device, printed by another on-site device, or transmitted electronically." Rather than the language as it appears in the agenda, which seems to still require a printed copy of the event logger information. Each one of these codes will need to be assessed to verify that the proposed update is applicable and appropriate and that they all reflect that this information must be produced by the device and available at the time of the inspection. If the item moves forward Recommends a Developing status.

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<u>CWMA 2025 Interim Meeting:</u>

The Committee reviewed and considered updated language from the submitter of this block of items. This language differed from what was printed in the agenda. After the original Block 3 items were published, the NTEP Measuring Sector met and wanted to further harmonize the Category 3 Sealing language between various Codes. The updated language from the NTEP Measuring Sector was presented to the Body during open hearing. The comments and recommendation below are based on the updated language. All supporting documents can be found on the CWMA site.

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to a hard copy at the time of inspection, provided the event logger information is retained in the system for future reference. ~~The information may be printed by the device, printed by another on-site device, or transmitted electronically.~~ The event logger shall have a capacity to retain records equal to 10 times the number of sealable parameters in the device, but not more than 1000 records are required. (Note: Does not require 1000 changes to be stored for each parameter.)

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NEWMA 2025 Interim Meeting:

The committee recommends a developing status for this item.

SWMA 2025 Annual Meeting:

The committee recommends voting status for this item.

B3: EMS-26.2 Table S.2.2. Categories of Device and Methods of Sealing

Item under Consideration:
Amend NIST Handbook 44 Non-Utility Electricity-Measuring Systems Code as follows:

Table S.2.2. Categories of Device and Methods of Sealing	
Categories of Device	***Methods of Sealing***
Category 1: *No remote configuration capability.*	*Seal by physical seal or two event counters: one for calibration parameters and one for configuration parameters.*
Category 2: *Remote configuration capability, but access is controlled by physical hardware.* *The device shall clearly indicate that it is in the remote configuration mode and record such message if capable of printing in this mode or shall not operate while in this mode.*	*The hardware enabling access for remote communication must be on-site. The hardware must be sealed using a physical seal or an event counter for calibration parameters and an event counter for configuration parameters. The event counters may be located either at the individual measuring device or at the system controller; however, an adequate number of counters must be provided to monitor the calibration and configuration parameters of the individual devices at a location. If the counters are located in the system controller rather than at the individual device, means must be provided to generate a hard copy of the information through an on-site device.*
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Previous Status:
New Proposal

Comments in Favor:

Regulatory:
-

Industry:
-

Advisory:
-

Comments Against:

Regulatory:
-

Industry:
-

Advisory:
-

Neutral Comments:

Regulatory:
-

Industry:
-

Advisory:
-

Item Development:
[Explain any changes made to the original proposal and committee recommendations]

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NEWMA 2025 Interim Meeting:

The committee recommends a developing status for this item.

SWMA 2025 Annual Meeting:

The committee recommends voting status for this item.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents

ITEM BLOCK 4 (B4) – ELECTRIC VEHICLE ~~FUELING SYSTEMS~~ SUPPLY EQUIPMENT

Source:
National Council on Weights and Measures

Purpose:
Rename the handbook 3.40 Code to match the terminology used within the Code.

OTH-26.3 Handbook 44 Main Table of Contents

Item under Consideration:
Amend NIST Handbook 44 Main Table of Contents as follows:

Main Table of Contents

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Section 3.

Previous Status:
2026: New Proposal

OTH-26.4 Section 3 Table of Contents

Item under Consideration:
Amend NIST Handbook 44 Section 3 Table of Contents as follows:

Section 3

Table of Contents

Note: In this section of Handbook 44, the reference temperature for the temperature compensation of refined petroleum products is shown as "15 °C (60 °F)." Although these values are not exact equivalents, they reflect industry usage when the SI and U.S. customary units are used in measurements.

Previous Status:
2026: New Proposal

EVF-26.4 Section 3.40. Electric Vehicle ~~Fueling Systems~~ Supply Equipment

Item under Consideration:
Amend NIST Handbook 44 Electric Vehicle Fueling Systems Code as follows:

Table of Contents

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Section 3.40. Electric Vehicle ~~Fueling Systems~~Supply Equipment

Section 3.40. Electric Vehicle ~~Fueling Systems~~**Supply Equipment** was added as a "tentative code" in 2015. In July 2022, the status of the code was changed from "tentative" to "permanent" effective January 1, 2023. (Amended 2022)

Previous Status:
2026: New Proposal

EMS-26.1 A. Application

Item under Consideration:
Amend NIST Handbook 44 Non-Utility Electricity-Measuring Systems Tentative Code as follows:

A. Application

A.1. General**.** – This code applies to measuring systems used in non-utility sales of electric energy wherein the sale is based in whole or in part on one or more measured quantities.

A.2. Exceptions**.** – This code does not apply to:

(a) The use of any measuring system owned, maintained, and/or used by a utility.

(b) Measuring systems used solely for delivering electric energy in connection with operations in which the amount delivered does not affect customer charges or compensation.

(c) Electric vehicle fueling systems. (See 3.40. Electric Vehicle ~~**Fueling Systems**~~**Supply Equipment** Code).

Transactions not subject to weights and measures authority.

Previous Status:
2026: New Proposal

TIM-26.1 S.1.4. Recorded Representations

Item under Consideration:
Amend NIST Handbook 44 Timing Devices Code as follows:

S.1.4. Recorded Representations.

S.1.4.1. Recorded Representations, Electric Vehicle Supply Equipment (EVSE) Timing Devices. – A timing device incorporated into an EVSE for use in assessing charges for timing separate from charges for electrical energy shall issue a recorded representation itemizing the charges for these services as defined in Section 3.40. Electric Vehicle ~~**Fueling Systems**~~**Supply Equipment**.

(Added 2015)

Previous Status:
2026: New Proposal

Original Justification:
The terminology, "Electric Vehicle Fueling Systems" is the title of the NIST Handbook 44 Code, but within the Code, the terminology, "Electric Vehicle Supply Equipment (EVSE)" is used. The latter is also what is defined in Appendix D. Having differing names for the same device type in Handbook 44 is confusing and unnecessary. "EVSE" has become the common acronym in referencing the devices by both regulators and industry.

NCWM recognizes that this will require changes in various sections of Handbook 44, and that NTEP staff will need to modify NCWM Publication 14 and existing NTEP Certificates of Conformance at no cost to certificate holders.

Comments in Favor:

Regulatory:
•

Industry:
•

Advisory:
•

Comments Against:

Regulatory:
•

Industry:
•

Advisory:
•

Neutral Comments:

Regulatory:
•

Industry:
•

Advisory:
•

Item Development:
[Explain any changes made to the original proposal and committee recommendations]

Regional Associations' Comments:
This block of items, as developed by NCWM, was not prepared in time for review by the regional associations.

Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to https://www.ncwm.com/publication-15 to review these documents.

Mark Lovisa, Louisiana | Committee Chair
Brett Willhite, Minnesota | Vice-Chair
Alison Wilkinson, Maryland | Member
Scott Dolan, Vermont | Member
Nathan Waldron, Nevada | Member
Éric Turcotte, Measurement Canada | Canadian Technical Advisor
Loren Minnich, NIST OWM | NIST Technical Advisor
Juana Williams, NIST, OWM | NIST Technical Advisor
Darrell Flocken, NCWM | NTEP Technical Advisor
Allen Katalinic, NCWM | NTEP Technical Advisor
Brian Terry, Arkansas | Committee Coordinator

Specifications and Tolerances Committee

1

Professional Development Committee (PDC)
2026 Interim Meeting Agenda

Scott Wagner, Committee Chair
Colorado

INTRODUCTION

The PD Committee will address the following items in Table A during the Interim Meeting. Table A identifies the agenda items by reference key, title of item, page number and the appendices by appendix designations. The first four digits of an item's reference key are assigned from the Subject Series List. The acronyms for organizations and technical terms used throughout the agenda are identified in Table B. In some cases, background information will be provided for an item. The fact that an item appears on the agenda does not mean it will be presented to National Council on Weights and Measures (NCWM) for a vote. The Committee will review its agenda and may withdraw some items, present some items for information meant for additional study, issue interpretations, or make specific recommendations for change to the publications identified which will be presented for a vote at the Annual Meeting. The Committee may also take up routine or miscellaneous items brought to its attention after the preparation of this document. The Committee may decide to accept items for discussion that are not listed in this document, providing they meet the criteria for exceptions as presented in Section H of the introductions to *Handbook 44* and *Handbook 130*. The Committee has not determined whether the items presented will be Voting or Informational in nature; these determinations will result from their deliberations at the Interim Meeting

An "Item Under Consideration" is a statement of proposal and not necessarily a recommendation of the Committee. Suggested revisions are shown in **bold face print** by ~~**striking out**~~ information to be deleted and **underlining** information to be added. Requirements that are proposed to be nonretroactive are printed in ***bold faced italics***.

All sessions are open to registered attendees of the meeting. If the Committee must discuss any issue that involves proprietary information or other confidential material; that portion of the session dealing with the special issue may be closed if (1) NCWM Chairman or, in their absence, NCWM Chairman-Elect approves; (2) the Executive Director is notified; and (3) an announcement of the closed meeting is posted on or near the door to the meeting session and at the registration table. If possible, the posting will be done at least a day prior to the planned closed session.

Subject Series List

Table A
Table of Contents

Table B
Glossary of Acronyms and Terms

Acronym	Term	Acronym	Term
CWMA	Central Weights and Measures Association	OWM	Office of Weights and Measures
NCWM	National Council on Weights and Measures	PDC	Professional Development Committee
NEWMA	Northeastern Weights and Measures Association	SWMA	Southern Weights and Measures Association
NIST	National Institute of Standards and Technology	WWMA	Western Weights and Measures Association
SETG	Skimmer Education Task Group		

Details of All Items
(In order by Reference Key)

EDU – EDUCATION

EDU-1 I Professional Certification Program

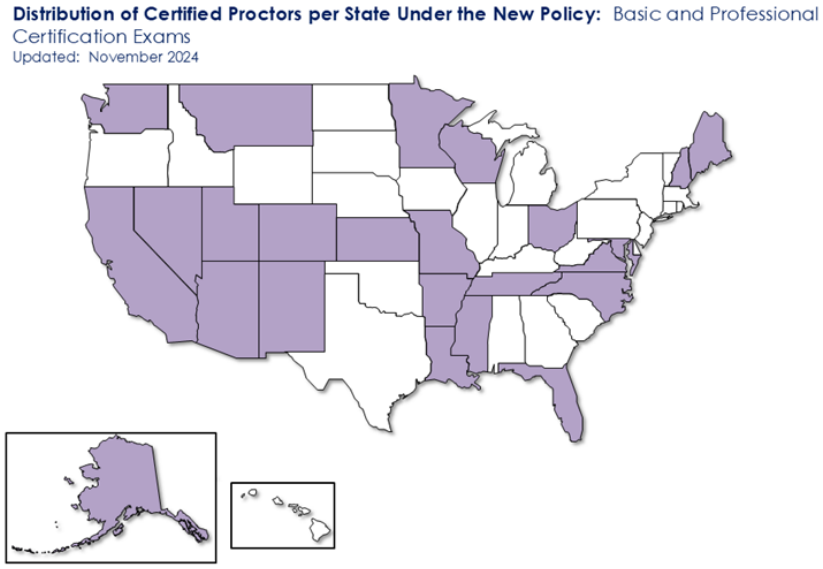
The NCWM offers eleven professional certification exams and two basic competency exams. The certification exams include Retail Motor Fuel Dispensers, Vehicle-Tank Meters, Small Capacity Scales, Medium Capacity Scales, Large Capacity Scales, Precision Scales, LPG and Anhydrous Ammonia, Price Verification, Basic Package Checking, Package and Labeling, and Method of Sale. The competency exams include Basic Weighing Devices and Basic Liquid-Measuring Devices. Professional certifications must be renewed every five years and NCWM notifies candidates whose certificates have expired.

NCWM initiated a Registered Service Agent (RSA) testing program in 2024. The program was established to provide testing for RSAs that could be used to meet regulatory licensing and registration requirements across the United States. The exams would greatly reduce travel and out of service times for the RSAs. The NCWM programs also relieve states of the burden of maintaining a testing program. Currently the RSA program offers exams for Handbook 44, Small Capacity Scales, Retail Motor Fuel Dispensers, Vehicle Tank Meters, LPG and Anhydrous Meters, Large Capacity Weighing Devices, and the Minnesota state exam.

Proctoring of exams was initiated in August 2018 and may be done virtually or in-person. Virtual proctoring was initiated in May 2021 and is offered at no cost to members. Guidance for virtual proctoring can be found on the same webpage and more detailed information, including a helpful YouTube video on preparing for proctoring can be found on the ProctorU website at https://support.proctoru.com/hc/en-us/articles/360043565051-Exam-Day-What-to-Expect-. In person proctoring is available through the state programs. The policy was changed in August 2023 to allow individuals within a program to proctor exams. The prospective proctor and the state director must sign an agreement provided by NCWM and the NCWM Executive Director must approve the proctor. Other government agencies, higher education institutions and commercial testing services may be approved as proctors.

Number of States with Proctors (As of November 2024)

The map below shows the states that have proctors available. For more details visit the NCWM website.



The table below shows the number of virtual and in-person proctored exams completed in FY 24.

	In-person	Virtual
Professional Certification	272	9
Basic Competency Certification	35	1

Status of Current Tests

The NCWM has issued 1474 professional certificates since program inception through September 30, 2024. Of the certificates issued, fifteen have been issued to individuals in the private sector. Some of the certificates have reached their 5-year expiration and certificate holders will need to seek recertification.

NCWM Professional Certificates

The table below shows the number of certificates awarded over the past ten years and the cumulative total since program inception.

	FY 14-15	FY 15-16	FY 16-17	FY 17-18	FY 18-19	FY 19-20	FY 20-21	FY 21-22	FY 22-23	FY 23-24
Certificates Awarded	198	140	142	257	53	56	60	56	80	158
Cumulative	503	643	785	1042	1095	1152	1212	1268	1316	1474

The table below shows the states using the professional certification program and the number of certificates earned since program inception and includes expired certificates. The Committee applauds these states and encourages increased use of the certification program.

State	Certificates	State	Certificates	State	Certificates
Minnesota	233	Nevada	29	Arkansas	8
Louisiana	177	Maine	27	Wyoming	7
Missouri	143	New Mexico	25	Delaware	4
Wisconsin	101	New York	19	Alabama	3
Maryland	87	Colorado	19	South Dakota	3
Virginia	81	Connecticut	15	Michigan	3
Alaska	64	Private	15	Tennessee	2
Mississippi	56	Ohio	14	Oregon	2

North Carolina	56	Montana	14	Tennessee	2
Washington	50	Indiana	13	Utah	2
Kansas	46	Massachusetts	11	Florida	1
California	41	Idaho	11	New Hampshire	1
Arizona	41	Pennsylvania	8	West Virginia	1
Nebraska	33	Vermont	8		

NCWM Basic Competency Certificates

The table below shows the number of basic competency certificates awarded since program inception.

	FY 17-18	FY 18-19	FY 19-20	FY 20-21	FY 21-22	FY 22-23	FY 23-24	Cumulative
Basic - Measuring	0	40	14	5	7	3	4	69
Basic - Weighing	1	30	11	12	9	2	4	73
Total Awarded	1	70	25	17	16	5	8	142

The table below shows those states with individuals holding a basic competency certificate. The Committee applauds these states and encourages increased use of the certification program nationwide

State	Certificates	State	Certificates
Louisiana	61	Nevada	2
Tennessee	42	Nebraska	2
Alaska	7	Arkansas	1
Montana	7	Kansas	1
Colorado	5	Private	1
Florida	3		

NCWM RSA Certificates

NCWM did not issued any RSA certificates during FY 23-24.

NCWM Meeting Comments:

2025 Annual Meeting:
No changes.
Mr Jerry Buendel provided an update on the status of the professional certification and registered service agent exam program.
Don Onwiler, NCWM, reinforced using the NIST Handbook 44 exam resulted in a higher success rate for the other exams. He encouraged everyone to prepare for and use this exam before moving on to taking the other exams.
Brent Ricks, Montana, echoed Mr. Onwiler's comments and encouraged others to take the exam and noted that the Montana inspectors found the exam to be very helpful in their success with the other exams. Alison Wilkinson, Maryland, thanked Jerry for his work. She encouraged more states to designate proctors and accept the NCWM exams. She also observed that many of the RSAs are not comfortable using virtual proctoring. Jerry remarked that a great deal of the credit for the success of the exam program goes to the SMEs that wrote the exams. He noted that the

approach to the RSA exams was to educate and evaluate. The state regulator SMEs selected questions to make mandatory to correct recurring deficiencies.

2025 Interim Meeting: Jerry Buendel (Retired), Professional Certification Program Coordinator, gave an update of the professional certification program. Mr. Buendel spoke about new Registered Service Agent (RSA) exams that are available. New exams for 2024 include a Large Scales RSA exam, LPG and Anhydrous RSA exam, and a Vehicle Tank Meter RSA exam. Mr. Buendel also updated membership in regard to the development of the EVSE RSA exam, which is expected to be completed in February 2025. Alison Wilkinson (Maryland) thanked the committee for its work. Ms. Wilkinson commented that Maryland is currently accepting RSA exam credentials. Ms. Wilkinson questioned if there is an available database of RSA exam certificate recipients that can be used to prevent the submission of altered certificates. Don Onwiler (NCWM Executive Director) stated a request can be made to allow an authorized regulator access to the exam certification database. Greg VanderPlaats (Minnesota) suggested an exam on mass flow meters be considered. Mr. Buendel initiated a discussion on possible alternative proctoring options such as commercial proctoring services. Mr. Buendel offered to assist members with writing and publishing state specific exams.

Regional Association Comments:

WWMA 2025 Annual Meeting:

Miland Kofford UT, Thanked the PDC and Jerry Buendel for work on the professional certification exams. These exams establish essential steps for career development.
Brent Ricks MT, Professional development is the responsibility of all of us, and we appreciate NIST's involvement, but we need to be self-reliant in training our people. Introduce the concept of empowering ourselves to bring forward ideas to elevate professional development. There is no excuse for a state not to have proctors available for these exams, as the NCWM has made this process very easy.
Robbie Parke WA, New in role as director, vacancies, professional development is needed for core competencies for all W&M inspectors.

The committee recommends an informational status for this item.

CWMA 2025 Interim Meeting:

Wyatt Spieker, State of Iowa. List of exams need to be updated to include EVSE for both Professional Certification and RSA exams.
The committee recommends this as an informational item.

NEWMA 2025 Interim Meeting:

Cheryl Ayer (New Hampshire) updated membership about upcoming exams. Jerry Buendel, Professional Certification Exam Coordinator is actively soliciting SME's to participate in a review and rewrite of the small capacity weighing system professional certification exam.

The committee recommends this as an informational item.

SWMA 2025 Annual Meeting:

Alison Wilkerson, Maryland recognized the great testing resources available through the program. She noted and thanked the individuals who assisted in the process. She also suggested more states start to use the exams and more in-person proctors per state to make it easier for RSA to accomplish them.

The committee recommends this as an informational item.

EDU-2 I Training

The purpose of this item is to share best practices and approaches to training in response to the broad training needs of weights and measures jurisdictions and to serve as a link to various training materials on the web. NIST OWM

PDC Liaison, Tina Butcher (NIST OWM), has regularly provided updates to the Committee on OWM's training resources and activities. Details of these updates can be found in prior Committee reports. Mrs. Butcher advised she will be stepping away from her role as NIST Liaison due to changes in her assignments; however, OWM will continue to keep the community apprised of its training activities and looks forward to continued work with the weights and measures community to develop and implement training to assist weights and measures officials and service personnel in their continued professional development.

NCWM Meeting Comments:

2025 Annual Meeting: No changes.
There were no updates to this item. Acting Chair Wagner encouraged the members to check the NIST website for upcoming training opportunities. Mahesh Albuquerque, Colorado, provided an update on the EVSE Training for RSAs and Inspectors scheduled for August 5 to 8 in Denver. He thanked the planning committee for their work organizing the event. There has been a very good response. They planned for 50 participants and to date over 82 have signed up. There is still space available.
Doug Rathbun, Illinois, thanked NIST for the VTM and Loading Rack training held last month in Springfield. He was pleased that there were attendees from several states.

2025 Interim Meeting: On behalf of NIST OWM, Committee chair Ethan Bogren (Westchester County, NY) provided an update. The update highlighted improvements to the NIST website. Improvements include enhanced navigation, improved accessibility to learning and professional development resources. Emily Hoyt (Maryland) expressed concerns with the hybrid training model regarding shipping delays, potential damage or compromised integrity of equipment that could occur during the transport of "Lab in a Box" supplies. Ms. Hoyt also questioned if course participation could be affected by shipping delays. Ms. Hoyt commented seeking information on who may be responsible for yet to be determined associated costs for the administration of training. David Sefcik (NIST OWM) addressed concerns stating that the hybrid training model is a work in progress. More details will be addressed over the upcoming year, citing that this training is not expected to be rolled out for approximately a year. Mr. Sefcik offered to connect Ms. Hoyt with Michael Hicks (NIST OWM) in hopes he can provide clarification to allay her concerns and create an accompanying FAQ document.

Regional Association Comments:

WWMA 2025 Annual Meeting:

Jose Arriaga, Orange County CA, Thanks to NCWM for EVSE training, he received positive feedback from his staff who attended. Recommend training for e-commerce oversight and application of e-commerce regulations and enforcement.

Kurt Floren, LA County CA, Also supports e-commerce training, we need uniformity in application across all jurisdictions. Question on EVSE training, is it a good model to have regulators and Service Agents combined in the same training?

Matt Douglas CA CDFA, Supports e-commerce training, uniform messaging is critical for e-commerce. Additional support may be required to identify responsible parties.

Aaron Yanker CO, Regarding RSAs and Regulators in the EVSE training is beneficial for building collaboration through joint attendance, but recognizes challenges with combined training.

Mahesh Albuquerque, CO, Appreciates the comments, the committee's conducted a post training recap. Training was mostly W&M officials with approximately 10 RSA's. The RSAs did not perform as well as the regulators on their exam. RSA prep work was recommended, not required for participation.

Kurt Floren LA County, Asks if there should be an RSA specific format for training?

Mahesh Albuquerque, CO, There may be value in separate training for RSAs

Miland Kofford, UT, He attended the training and stated the interaction and collaboration between the RSAs and regulators was good. Application and interpretation is different between the two and likes the idea of break-out sessions for RSAs and regulators.

Mal Skowron, Tesla, Very useful to have interaction and hear firsthand on challenges. The dialog between RSAs and regulators is very valuable and supports the combined training. Her attending EVSE training, she has now identified what level technician to send to subsequent EVSE training.

Khoa Lam, LA County, Attended the EVSE training. EVSE industry will continue to grow and the number of RSA's will increase. Khoa stated that RSAs have specific needs and resource constraints. Suggested methodology for designing future training to incorporate distinct sessions for RSAs and regulators. Recommended recording training and incorporating a video component for onboarding and future training.

Scott Simmons P20:10 Services LLC, As a national trainer he knows that RSAs operate differently than W&M inspectors. RSAs are frequently making repairs and placing devices into service and their starting point is at different places. Although there are benefits to having the training split, having a blended training would provide a benefit to both parties.

Dan Hollow, TESCO, We have training videos on EVSE test equipment use on our website.

Kurt Floren, LA County, Important to clarify the RSA requirement that a device must be "correct"

Aaron Yanker, CO, Echoed Mr. Floren's comment and we need to get RSAs engaged across all devices for uniformity. This will establish confidence in and consistency with RSA and regulator training.

Brent Ricks, MT, Values comments and perspectives heard today and wished to task the committee to develop trainings across jurisdictions. Taking the HB 44/130 training is a great benefit. Set up a training path to promote device knowledge for each device type.

The committee recommends an informational status for this item.

CWMA 2025 Interim Meeting:

LAUREN MINNICK (NIST)

NIST is attempting to decide best way to approach in training, as travel for in-person training is expensive and is a restraint; Supplemental resources are on website; NIST is going to continue to develop self-taught webinars. Continue to visit NIST Website!

The committee recommends this as an informational item.

NEWMA 2025 Interim Meeting:

No comments were heard.

The committee recommends this item remain informational.

SWMA 2025 Annual Meeting:

Tory Brewer, West Virigina wanted to stress the PDC become more involved aligning with the agenda of NCWM Chairman Kevin Schnepp. He gave suggestions of training potentials such as price verification, and package checking. He also suggested metrology as a crossover to understanding what they are looking at on certificates and important information for field inspections and the care of standards. These training courses should fit into 15-20 minute time frame.

The committee recommends this as an informational item.

EDU-3 I Instructor Improvement

The Committee has reiterated multiple times in the past that the responsibility for the training employee rests with individual organizations (weights and measures jurisdictions and industry alike). While NIST and other training providers offer excellent sources of training and training materials, organizations must develop and manage their own training programs, including developing trainers; establishing individual development plans for employees; and identifying strategies for continually assessing and responding to training needs. The Committee recognizes that NIST OWM cannot possibly train all weights and measures inspectors in the country. The state and municipal jurisdictions have ultimate responsibility for training and qualifying their personnel. To fulfill this responsibility, jurisdictions should be making individual plans to maintain or bolster their training efforts. NIST OWM should be viewed as one vital resource to support that effort. The Professional Development Committee is another resource. The Committee has created and posted on its website, the "Body of Knowledge" to establish uniform learning objectives for weights and measures professionals. In addition, the Committee has posted a Model Field Training Program document on its website. This program outlines methods to evaluate and document training and offers guidance on training new inspectors and taking steps to ensure their ongoing development.

NIST OWM has also provided ongoing contributions to assist the community in the development of instructors. OWM has provided legal metrology training for weights and measures jurisdictions and industry for many years but does not have the resources to respond to the numerous training requests it receives. OWM has long recognized that there are many individuals with extensive legal metrology experience who have the skills needed to provide this type of training. OWM hopes to continue to draw from this pool to develop trainers who can present schools with NIST, thus leveraging NIST resources; providing more timely classes; and providing a way to more broadly share the valuable expertise these individuals possess. In the past ten years, NIST OWM has taken on more field inspection classes than it would otherwise be able to do because of the co-instructors drawn from its current pool of trainers.

Mrs. Tina Butcher (NIST OWM) has routinely updated the Committee on instructor development work by NIST OWM and has regularly emphasized that OWM sincerely appreciates the time and resources committed by these trainers and their organizations in support of this important partnership and the expertise that these trainers bring to NIST training events and looks forward to continued collaboration. During the 2023 NCWM Annual Meeting, Mrs. Butcher touched on the topic of 'blended' training programs which use a blend of training delivery methods (e.g., combining virtual training mechanisms such as instructor-led webinars, on-demand or self-study with in-person hands-on content) during discussions on this item. She noted this may also be a path to revive the 'training the trainer' initiative and grow outreach.

OWM will continue to provide the Committee with updates on its progress as well as continue to collaborate with and support the Committee in its work.

See the Committee's past reports for background information on this item along with other details on available tools for trainer development and NIST OWM's efforts and partnership with the NCWM to continue this work.

NCWM Meeting Comments:

2025 Annual Meeting: No comments, no changes

2025 Interim Meeting : Ethan Bogren (Westchester County, NY) provided an update. A beta test was conducted on the "blended" RMFD training course in October 2024 with the state of Louisiana. Overall the test was considered a success and a final product will be introduced in the near future. No comments were heard on this item.

Regional Association Comments:

WWMA 2025 Annual Meeting:

Bill Striejewske, NV, He has been attending the meetings for ten years, there was a lot of talk of "Train the Trainer" program when he first started, and has not heard anything about that program in 4-5 years. He acknowledges that NIST is struggling with budget and their ability to travel but feels his staff misses the opportunity for in person training. Maybe it is time to restart the "Train the Trainer" program.

Chris Wagner, NPGA, They conduct a lot of training and look at established methodologies for training, there are resources nationally available. The Propane Education Resource Council has developed training for instructors which is available at propane.com. There is a 6.5 hour course on trainer development and a 2.5 hour course on field training. Both courses are eligible for continuous education unit recognition, and is a free resource.

Scott Simmons P20:10 Services LLC, Echoes Chris Wagner's comments, the resource is huge. Recommends to all W&M officials, get online and use these resources.

Aaron Yanker, CO, He also agrees with previous commentors. He recommends looking at other associations regarding presenter and trainer training.

Scott Wagner CO, We have used that training and require it for our RSAs. Recommends leveraging this resource.
Brent Ricks, MT, Echoes previous comments from EDU-1 for EDU-3.

The committee recommends an informational status for this item.

CWMA 2025 Interim Meeting:

Metrology Workshop notes from Kevin Uphoff (KS) posted to website

The committee recommends this as an informational item.

NEWMA 2025 Interim Meeting:

No comments were heard.

The committee recommends this item remain informational.

SWMA 2025 Annual Meeting:

No comment.

The committee recommends this as an informational item.

EDU-4 I Recommended Topics for Conference Training

The Board of Directors has charged the Committee with recommending appropriate topics for the technical sessions at future annual meetings. The Board of Directors asks the PDC to review and prioritize possible presentation topics and to submit those to the NCWM Chairman. The Chairman will coordinate with NCWM staff to secure presenters.

The following is a list of technical presentations made at the NCWM since 2009. Presentations given since 2010 are available at www.ncwm.com/annual-archive.

- Planning and Coordinating a National Market Place Survey (Ms. Rachelle Miller, WI, 2017)
- The Life Cycle of Petroleum from Well to Retail (Mr. Prentiss Searles, API 2017)
- The United States Mint at Denver – Gold, Coins and Embezzlement (Mr. Thomas Fesing, 2016)
- Understanding Transportation Network Systems (Ms. Andrea Ambrose Lobato, Lyft and Mr. Bob O' Leary, Uber 2016)
- Regulatory Consideration for Legalized Marijuana (Ms. Julie Quinn, MN, and Mr. Nick Brechun, CO,

2016)
- Motor Oil Quality Violations (Mr. Tom Glenn, Petroleum Quality Institute of America, 2014)
- Making Sense of Electronic Receipts (Mr. Justin Hotard, Vice President and General Manager, NCR Corporation, 2014)
- LNG & CNG Motor Fuel – A Technical Briefing from Industry (Mr. Doug Horne, President CVEF, Mr. Zack Wester, Blu, Mr. Jeff Clarke, NGVA, 2014)
- Taximeter Technology Advancements (Mr. Matt Daus, International Association of Transportation Regulators, 2013)
- Advanced Vehicles and Fuel Quality (Mr. John M Cabaniss, Jr., Association of Global Automakers, 2013)
- Economic Justification and Demonstrating Value of Weights and Measures (Mr. Tim Chesser, Arkansas Bureau of Standards, 2012)
- Conducting Effective Marketplace Surveys and Investigations (Ms. Judy Cardin, Wisconsin Weights and Measures, 2012)
- Public Relations and Customer Service as Regulators (Mr. Doug Deiman, Alaska Division of Measurement Standards/CVE, 2012)
- An Overview of Unit Pricing in the United States (Mr. David Sefcik, NIST OWM, 2011)
- Grocery Unit Pricing in Australia (Mr. Ian Jarratt, Queensland Consumers Association, 2011)
- Grocery Unit Pricing in Canada (Mr. Ian Jarratt, Queensland Consumers Association, 2011)
- The U.S. Hydrogen Measuring System: The Turning Point? (Ms. Kristin Macey, California Division of Measurement Standards, 2011)
- Corrosion in Ultra Low Sulfur Diesel Underground Storage Systems (Mr. Prentiss Searles and Ms. Lorri Gainawi, American Petroleum Institute, 2010)
- Risk-Based Inspection Schemes (Mr. Henry Oppermann, Weights and Measures Consulting, LLC, 2010)
- Diesel Exhaust Fluid (DEF) (Mr. Gordon Johnson, Gilbarco, Inc., and Mr. Randy Moses, Wayne, 2009)
- Fuel Volatility and Ethanol Blending (Mr. Jim McGetrick, BP Products, 2009)
- Investigative Techniques (Mr. Michael Cleary, Retired, 2009)

NCWM Meeting Comments:

2025 Annual Meeting: No comments, no changes .

2025 Interim Meeting: The PD Committee Chair Ethan Bogren (Westchester County, NY) provided a review of previously suggested topics. No comments were heard from membership.

Regional Association Comments:

WWMA 2025 Annual Meeting:

Mike Brooks, AZ, Commented that the 2009 list is dated and needs to be revamped. We can collaborate as a body for suggestions on topics.

Mahesh Albuquerque, CO, He agreed with Mike Brooks and he mentioned that NIST used to hold administrator workshops that was very beneficial especially for new administrators. Recommended reviving administrator workshops through NCWM and NIST collaboration

The committee recommends an informational status for this item.

CWMA 2025 Interim Meeting:

No comments

The committee recommends this as an informational item.

NEWMA 2025 Interim Meeting:

Mike Smith (New York) suggested railroad scale training as an offering. Jason Flint (New Jersey) commented that

the USDA has disbanded it's railroad scale testing program and has decommissioned it's master scale. Prentiss Searles (API) suggested that training be offered either a day before or a day after NCWM meetings in order to bolster participation. Steve Benjamin (TSL Consulting) commented that SEWMA has held training in the days before their annual meeting.

The committee recommends this item remain informational.

SWMA 2025 Annual Meeting:

No comment.

The committee recommends this as an informational item.

PMT – PROGRAM MANAGEMENT

PMT-1 I Safety Awareness

One of the goals of the PDC is to educate jurisdictions on safety issues and to provide resources to help them implement effective safety and health management programs. The Committee intends to use the safety page at www.ncwm.com/safety as a place for states to share information and resources to help them address each of the major steps in creating and maintaining an effective safety program.

In July 2017, the Board of Directors created the Safety Task Group to create a safety tool kit to help weights and measures organizations create or improve their own safety programs. The toolkit is complete and is posted on the NCWM website at www.ncwm.com/safety.

At the 2018 Annual Meeting, the NCWM BOD decided to make the task group a permanent subcommittee associated with the PDC. The newly formed Safety Subcommittee will assume responsibility for:

- Maintaining and updating the safety toolkit.
- Writing and deploying the NCWM annual safety survey, as well as reporting on the results each year.
- Finding resources and/or developing weights-and-measures-focused materials relating to the top hazards identified through the safety survey or through developing the toolkit.
- Building a safety culture and developing safety leadership within the NCWM through participation on the Safety Subcommittee

The Safety Subcommittee is currently working to improve the annual safety survey by:

- Including questions about near-miss incidents and about incidents resulting in lost or restricted time over multiple years.
- Contacting counties and associate members to increase participation.
- Writing an instruction guide to help participants gather information they need before completing the survey.

The Committee expresses appreciation to the members of the Safety Subcommittee for their willingness to volunteer for this important work.

Safety Subcommittee Members		
Chair	John Satterlee	Illinois
Public Sector	Michael Peeler	New Jersey
Public Sector	John Bell	Missouri
Public Sector	David Fraser	Montana
Private Sector	Bill Callaway	Owl Services
Private Sector	Christopher Wagner	National Propane Gas Association

Private Sector	Robert LaGasse	Mulch and Soil Council

The NCWM safety page houses the list of regional safety liaisons and an archive of past safety articles.

Regional Safety Liaisons:

Central Weights and Measures Association (CWMA)
Mr. John Bell, Missouri Department of Agriculture

Northeastern Weights and Measures Association (NEWMA)
Mr. Michael Peeler, New Jersey Weights and Measures

Southern Weights and Measures Association (SWMA)
Christopher Wagoner, National Propane Gas Association

Western Weights and Measures Association (WWMA)
Mr. David Fraser, Montana Weights & Measures

Each region is responsible for providing a safety article for the NCWM newsletter according to the following schedule:

Safety Article Schedule		
Issue Date	**Source**	**Article Deadline**
Issue 2 (May 2025)	NEWMA	April 15, 2025
Issue 3 (September 2025)	CWMA	August 13, 2025
Issue 1 (February 2026)	WWMA	January 15, 2026
Issue 2 (May 2026)	SWMA	April 15, 2026

The Committee would like to thank the following individuals for their contributions since the 2021 Annual Meeting:

- *A Resource For Safety*– Mr. John Bell (MO)
- *The Danger Zone of Familiarity* – Mr. Ron Armstrong (NWTES)
- *Ergonomics and Musculoskeletal Disorders* – Mr. Ron Armstrong (NWTES)
- *Taking Unnecessary Risks* – Mr. Robert Huff (DE)
- *Food Safety and the Weights and Measures Inspector* – Mike Peeler (NJ)
- *Metrology Laboratory Safety* – John Bell (MO)

NCWM Meeting Comments:

2025 Annual Meeting: No comments, no changes

NCWM 2025 Interim Meeting: John Satterlee (Illinois), Safety Awareness Subcommittee Chair provided an update. In regards to membership, Christopher Wagoner of the National Propane Gas Association has been selected to fill the vacant position of Regional Safety Liaison for the Southern Weights and Measures Association (SWMA). Next, during the Safety Subcommittee meeting, Mr. Satterlee gave a presentation on lead abatement in a metrology laboratory. Some main points were how to clean a metrology lab with lead mitigation in mind, multiple-tiered laboratory cleaning, and possible alternatives to lead in weights and measures. The Illinois Metrology Lab had an OSHA lead test in 2024 and we shared our results and OSHA recommendations to the group. Christopher Wagoner of the National Propane Gas Association stated he would like it if we added propane safety items to the safety articles and surveys.

Regional Association Comments:

WWMA 2025 Annual Meeting:

No comments were heard. The committee looks forward to reading ongoing discussion from other regional association meetings.

The committee recommends an informational status for this item.

CWMA 2025 Interim Meeting:

No comments.

The committee recommends this as an informational item.

NEWMA 2025 Interim Meeting:

Mike Peeler (New Jersey) updated membership on the activity of the Safety Awareness Task Group. Mr. Peeler indicated the group plans to meet quarterly with the next meeting scheduled for December 16th, 2025. Jim Willis (New York) discussed a recent incident that occurred during the testing of an aircraft refueling VTM. During an inspection while returning fuel to the truck avgas fumes ignited creating an emergency situation. Mr. Willis reported that there were no injuries and the flames were eventually extinguished by emergency personnel. This incident facilitated a shutdown of the airport fuel testing program. A thorough review of the program is currently being conducted with input from NATA (National Air Transportation Association).

The committee recommends this item remain informational.

SWMA 2025 Annual Meeting:

No comment.

The committee recommends this as an informational item.

PMT-2 I Fraud Prevention and Education Task Group

The Fraud Prevention and Education Task Group (FPETG) was formed in 2024. The FPETG was previously recognized as the Skimmer Education Task Group (SETG). The group expanded its scope from the primary focus being credit card skimming devices to now include any type of fraud that affects the weights and measures community.

The FPETG is charged with researching both existing and emerging issues regarding fraudulent practices. The group has been formed to develop educational outreach strategies and materials to educate regulatory, retailers, industry members and consumers in identifying and addressing fraudulent practices encountered by weights and measures programs. The FPETG will actively solicit topics from membership, and select topics to develop into a presentation to be given during the NCWM Annual Meeting beginning in 2025.

Skimmer Education Task Group Members		
Co-Chair	Alan Walker	Florida
Co-Chair	Matthew Williams	Texas
Public Sector	Paul Floyd	Louisiana
Public Sector	John Larkin	California
Public Sector	Mike Harrington	Iowa
Public Sector	Robert Huff	Delaware
Public Sector	Michael Peeler	New Jersey
Public Sector	Michael Kelly	Westchester County, New York
Public Sector	John McGuire	NIST, Office of Weights and Measures
Private Sector	Brent Price	Gilbarco, Inc.
Private Sector	Mike Roach	PDI
Private Sector	Scott Boorse	PEI
Private Sector	Scott Schober	Berkley Varitronics Systems

NCWM Meeting Comments:

2025 Annual Meeting: No changes.
Matt Douglas, California, thanked the task group for their work on this continuing and growing problem.

2025 Interim Meeting: Alan Walker (Florida) FPETG Chair provided an update to membership. The Fraud Prevention and Education Task Group Meet three times in 2024 and submitted three articles to be uploaded to the NCWM web site. The first article contains information on skimmers. The second article is about SEPTA "Skimming & Payment terminal Attack." . This organization is made up of law enforcement, industry, and regulators. The final article contains information on Juice Jacking. Mr. Walker's update included information on upcoming articles on Fuel Pulsars and Fake QR codes. The FPETG is working on a presentation for the membership at the 2025 Annual Meeting.

Regional Association Comments:

WWMA 2025 Annual Meeting:

Scott Wagner, CO, Commend work of Task Group, asks if this is still a W&M issue. Facilitation of fraud is a direct nexus, however, secret service is prosecuting these cases, we need to review the status of W&M role in law enforcement. Perhaps some form 15s are needed to clarify W&M responsibilities. Recommends the task group look at previous work where technology has changed and evolved. Device security requirements in the handbooks should be reviewed and updated as appropriate.

Kurt Floren, LA County, Repeated is this still a W&M issue? We made the connection of the RMFD, but where do we draw the line at what is a W&M issue? EBT benefits and other POS fraud is outside our scope. What are the expectations and funding resources to support oversight? Be careful what we codify as our responsibility until funding and expectations are established.

Matt Douglas, CA, We need to define what aspects belong in our jurisdiction. Staff need to be trained to take valid and proper enforcement. Having specific qualifications to prosecute violations. Staff safety is a concern with organized crime.

John Bell, Ventura County, CA, Echoed Kurt Floren's comments. There are groups that handle skimmer fraud and other forms of identity theft such as the SAPTA work group. Knowing what these groups do can provide better guidance on what W&M role should be.

The committee recommends this as an informational item.

CWMA 2025 Interim Meeting:

No comments.

The committee recommends this as an informational item

NEWMA 2025 Interim Meeting:

Mike Peeler (New Jersey) provided an update of the group. The group is discussing topics for a planned presentation at the 2026 NCWM Annual Meeting.

The committee recommends this item remain informational.

SWMA 2025 Annual Meeting:

No comment.

The committee recommends this as an informational item.

PMT-3 Metrology Subcommittee

The PDC received the following report from Lisa Corn, Texas, on the work of the Metrology Subcommittee. The subcommittee is actively focused on three key initiatives, all of which are in progress and aimed at strengthening communication, training, and support across the legal metrology community.

First, we're finalizing a standardized form that will be used to submit proposed changes to NIST SOPs and Handbook 105 series documents. This form is intended to streamline the feedback process and ensure that suggestions from the labs are formally documented and submitted in a consistent, structured manner.

Second, we're developing an On-the-Job Training (OJT) framework that will serve as the foundation for a broader OJT resource library. This library will feature SME developed training modules to support new metrologists and assist labs in standardizing their training approaches across regions.

Third, we've begun work on a training resource geared toward directors and administrators who may not have a metrology background. The goal is to provide them with a better understanding of metrology lab operations, including staffing, standards, maintenance, and compliance requirements so they can better support their teams.

These efforts are all in progress, but they reflect a strong collaborative push to address ongoing gaps in training, communication, and resource development

NCWM Meeting Comments:

New Item.

Regional Association Comments:

WWMA 2025 Annual Meeting:

No comments were heard. The committee looks forward to reading ongoing discussion from other regional association meetings.

The committee recommends an informational status for this item.

CWMA 2025 Interim Meeting:

No comments.

The committee recommends this as an informational item.

NEWMA 2025 Interim Meeting:

Marc Paquette (Vermont) provided an update of the groups activity. Scott Dolan (Vermont) stated that the Metrology Subcommittee has begun the creation of an on the job training library to aid metrologists in their understanding of a variety of metrology laboratory topics. Examples of these topics are mentorship of new metrologists, data integrity, traceability, and calculating and reporting uncertainties. The group will be meeting once every 2 months and hopes to deliver these job aids by July 24th, 2026.

The committee recommends informational status for this item.

SWMA 2025 Annual Meeting:

No comment.

The committee recommends this as an informational item.

Scott Wagner, Colorado | Committee Chair
Shane Ireland, Maine | Vice-Chair
Sherry Turvey, Kansas | Member
Valerie Forbes, Delaware | Member
Brent Ricks, Montana | Member
Perry Lawton, TESCO | Member
Marie-Paul Vanasse, Measurement Canada | Canadian Technical Advisor
John Satterlee, Illinois | Safety Liaison
Vacant | NIST Liaison
Jerry Buendel, Retired | Professional Certification Coordinator

Professional Development Committee

2026 Interim Meeting Agenda
National Type Evaluation Program (NTEP) Committee

Mr. Marc Paquette, Committee Chair
Vermont

INTRODUCTION

The NTEP Committee (hereinafter referred to as the "Committee") will address the following items in Table A during the Interim Meeting. Table A identifies the agenda items by reference key, title of item, page number and the appendices by appendix designations. The first four digits of an item's reference key are assigned from the Subject Series List. The acronyms for organizations and technical terms used throughout the agenda are identified in Table

B. In some cases, background information will be provided for an item. The fact that an item appears on the agenda does not mean it will be presented to the National Council on Weights and Measures (NCWM) for a vote. The Committee will review its agenda and may withdraw some items, present some items for information meant for additional study, issue interpretations, or make specific recommendations for change to the publications *NCWM Publication 14, Administrative Policy* and *NCWM Publication 14, Technical Policy, Checklists, Test Procedures*. Changes to *NCWM Publication 14, Administrative Policy* are by recommendation of the Committee and a majority vote of the Board of Directors. Changes to *NCWM Publication 14, Technical Policy, Checklists, Test Procedures* are by recommendation of the National Type Evaluation Committee (NTEP) sectors and a majority vote of the NTEP Committee. The Committee may also take up routine or miscellaneous items brought to its attention after the preparation of this document. The Committee may decide to accept items for discussion that are not listed in this document, providing they meet the criteria for exceptions as presented in *NCWM Policy 3.1.4. Handbooks, Procedures to Modify Handbooks*. The Committee has not determined whether the items presented will be Voting or Informational in nature; these determinations will result from their deliberations at the Interim Meeting.

An "Item Under Consideration" is a statement of proposal and not necessarily a recommendation of the Committee. Suggested revisions are shown in **bold face print** by ~~**striking out**~~ information to be deleted and **underlining** information to be added. Requirements that are proposed to be nonretroactive are printed in ***bold faced italics***. Additional letters, presentations and data may have been part of the committee's consideration. Please refer to www.ncwm.com/publication-15 to review these documents.

All sessions are open to registered attendees of the meeting. If the Committee must discuss any issue that involves proprietary information or other confidential material, that portion of the session dealing with the special issue may be closed if (1) NCWM Chairman or, in their absence, NCWM Chairman-Elect approves; (2) the Executive Director is notified; and (3) an announcement of the closed meeting is posted on or near the door to the meeting session and at the registration table. If possible, the posting will be done at least a day prior to the planned closed session.

Note: *It is policy to use metric units of measurement in publications; however, recommendations received by NCWM technical committees and regional weights and measures associations have been printed in this publication as submitted. Therefore, the report may contain references to inch-pound units.*

Subject Series List

Table A
Table of Contents

Table B
Glossary of Acronyms and Terms

Acronym	Term	Acronym	Term
CC	Certificate of Conformance	NCWM	National Council on Weights and Measures
CIML	International Committee of Legal Metrology	NIST	National Institute of Standards and Technology
DoMC	Declaration of Mutual Confidence	NTEP	National Type Evaluation Program
IV	Initial Verification	OIML	International Organization of Legal Metrology
MAA	Mutual Acceptance Arrangement	OIML-CS	International Organization of Legal Metrology – Certificate System
MC	Measurement Canada	OWM	Office of Weights and Measures
MDMD	Multiple Dimension Measuring Devices	R	Recommendation
MRA	Mutual Recognition Arrangement	VCAP	Verification Conformity Assessment Program

Details of All Items
(In order by Reference Key)

INT – INTERNATIONAL

INT-1 I Mutual Recognition Arrangement (MRA)

The MRA between Measurement Canada (MC) and NTEP labs originated April 1, 1994. Since that time, the original MRA has expanded, and a second MRA covering measuring devices was developed. On Tuesday July 26, 2016, NCWM Chairman Jerry Buendel and Measurement Canada President Alan Johnston signed a renewal MRA that provides for continued cooperation between the two organizations and continuation of the beneficial partnership. The new MRA will be effective for 5 years.

The scope of the current MRA includes:

- gasoline and diesel dispensers.
- high-speed dispensers.
- gasoline and diesel meters intended to be used in fuel dispensers and truck refuelers;
- electronic computing and non-computing bench, counter, floor, and platform scales with a capacity up to 13 1000 kg (2000 lb);
- weighing/load receiving elements with a capacity of up to 1000 kg (2000 lb);
- electronic weight indicating elements (except those that are software based, i.e., programmed by downloading parameters); and
- mechanical scales up to 10 000 kg (20 000 lb).

MC, NTEP, and all our mutual stakeholders agree that the MRA is a benefit for the North American weights and measures industry. The NTEP Committee appreciates the efforts and cooperation of Measurement Canada and is working with MC to continue the cooperative arrangement.

The current agreement expires on July 26, 2026.

INT-2 I OIML-Certification System (CS)

Implementation of the (new) International Organization of Legal Metrology – Certification System (OIML-CS) officially began in January 2018, replacing the previous OIML MAA and basic certificate systems. NCWM signed the OIML MAA Declaration of Mutual Confidence (DoMC) for Recommendation (R) 60 "Load Cells" as a Utilizing Participant in 2006 and NCWM signed the OIML-CS Utilizer Declaration for R 60 in January 2018. A Utilizer is a participant in the system that does not issue any OIML Certificates of Conformance (CC) or OIML Test Reports but does utilize the reports issued by OIML-CS Issuing Authorities and Authorized Testing Laboratories.

Dr. Ehrlich serves on the Management Committee of the OIML-CS, and Mr. Gibson serves on the OIML-CS Review Committee. The US (NTEP) supports the OIML-CS process and has agreed to continue accepting OIML-CS R 60 test data for load cells with the provision that any use of manufacturer test data is clearly identified on the test report section of the certificate because NTEP cannot use manufacturer test data towards issuance of an NTEP certificate. The OIML-CS criteria align with the NTEP Committee's recommendations, and the instructions provided by the NCWM Board of Directors.

Dr. Ehrlich has requested, on multiple occasions, that NCWM review its policy regarding participation in the OIML-CS (and previously participation in the OIML-MAA) for R76 (Non-Automatic Weighing Instruments). The NCWM has continued to follow a policy that was established in 2006 to not participate in R76 until NCWM can do so as an Issuing Authority. In 2016, the Board revisited the 2006 discussions leading to that decision, including considerations for NTEP labs' workload, potential lost expertise, concerns with quality of evaluations at some foreign labs, etc. Since there were no new developments to affect its decision, the NCWM Board of Directors agreed to maintain existing policy. Dr. Ehrlich suggested that if there was no possibility in sight that the NCWM could become an Issuing Authority, then it should consider becoming a Utilizer for OIML R76 under the OIML-CS. Some U.S. manufacturers support current NCWM policy on this, but others would prefer a change.

The instruments under what is called "Scheme A", where accreditation or peer review is required of the Issuing Authority and its Test Labs. In addition to R60 and R76, some of the instruments and systems in the OIML-CS that are probably of the most interest to NCWM members include: OIML R21 (Taximeters), R46 (Active Electrical Energy Meters), R49 (Water meters), R51 (Automatic catch-weighers), R59 (Moisture meters for cereal grains and oilseeds), R61 (Automatic gravimetric filling instruments), R85 (Level gauges for stationary storage tanks), R106 (Automatic rail-weighbridges), R117 (fuel dispensers and other liquid flow systems), OIML R129 (Multi-dimensional measuring instruments), and R137 (Gas meters).

Information regarding the OIML-CS can be found at www.oiml.org. Dr. Ehrlich represents the U.S. interests in this work and regularly provides updates to the NCWM Board of Directors on these activities.

ACT – ACTIVITY REPORTS

ACT-1 I NTEP Participating Laboratories and Evaluations Reports

The NTEP laboratories/evaluators meeting will be held in March 2026 at the NTEP Laboratory in Columbus, Ohio.

NTEP continues to routinely survey customers pertaining to NTEP administration and laboratories customer service. The survey is released to active Certificate of Conformance (CC) holders. The NCWM Board of Directors routinely reviews the results of the survey to form a continuous improvement plan for NTEP. With any survey, the challenge is to develop a document that is concise enough that customers will respond, while also providing a meaningful set of data. To date, the NCWM Board of Directors is finding general approval of NTEP services.

The Committee reviewed NTEP statistics through September 2025. The review of statistics shows that incoming applications have increased over previous years creating a manageable but increased evaluation backlog. While the backlog is larger than in previous years, the application processing, evaluation times, and certificate issuing is consistent with previous years. See Appendix A for NTEP statistics.

ACT-2 I NTEP Sector Reports

All NTEP Sector Reports are available to members at the time *NCWM Publication 15* is published. The NTEP Committee is committed to ensuring electronic versions of sector reports are available with *NCWM Publication* 15. Please note the sector summary reports will only be available in the electronic version of *NCWM Publication 15* and at www.ncwm.com/interim-archive; they will not be available in printed versions of *NCWM Publication 15*.

NTEP Weighing/Belt-Conveyor Scale Sector:
The NTEP Weighing Sector met on August 19-20, 2025. The next meeting is scheduled for 12 August 18-19, 2026. Refer to the Sectors web page for additional details. For questions on the status of sector work or to propose items for a future meeting, please contact either the Chair and/or the NTEP Administrator.

Sector Chair	NTEP Administrator
Ms. Jessica Ferree Metter-Toledo, LLC jessica.ferree@mt.com	Mr. Jeff Gibson Ph: 740-507-6343 jeff.gibson@ncwm.com

NTEP Grain Moisture Meter and NIR Protein Analyzer Sectors:
The Grain Moisture Sector was held on August 5, 2025. Refer to the Sectors web page for a copy of the meeting summary. The 2026 meeting is scheduled for Tuesday, August 11, 2026, at the FGIS facility in Kansas City Missouri. For questions on the status of sector work or to propose items for a future meeting, please contact the sector Chair and/or the NTEP Administrator.

Sector Chair	NTEP Administrator
Mr. Jimmy Williams Missouri jimmy.williams@mda.mo.gov	Mr. Jeff Gibson Ph: 740-507-6343 jeff.gibson@ncwm.com

NTEP Measuring Sector:
The Measuring Sector met on September 16-17, 2025. The 2026 Measuring Sector Meeting is scheduled for September 15-16, 2026, in conjunction with the Software Sector. Refer to the Sectors web page for additional details. For questions on the status of sector work or to propose items for a future meeting, please contact the sector Chair and/or the NTEP Administrator.

Sector Chair	NTEP Administrator
Mr. Brent Price Gilbarco Inc brent.price@gilbarco.com	Mr. Jeff Gibson Ph: 740-507-6343 jeff.gibson@ncwm.com

NTEP Software Sector:
A joint meeting of the Software and the Weighing Sector was held on August 20 - 21, 2025. The next meeting for the Software Sector is scheduled in conjunction with the Measuring Sector on September 16-17, 2026. Refer to the Sectors web page for additional details. For questions on the status of sector work or proposed items for a future meeting, please contact the sector Chair and/or the NTEP Administrator:

Sector Chair	NTEP Administrator
Mr. James Pettinato Guidant Measurement jim.pettinato@guidantmeasurement.com	Mr. Jeff Gibson Ph: 740-507-6343 jeff.gibson@ncwm.com

NTEP Multiple Dimension Measuring Devices (MDMD) Work Group:
The NTEP MDMD Work Group meeting was held on May 7th, 2025. The 2026 meeting is scheduled for May 6th.

Refer to the Sectors web page for additional details. For questions on the status of work group or to propose items for a future meeting, please contact the sector Chair and/or the NTEP Administrator.

Workgroup Chair	NTEP Administrator
Mr. Chris Senneff Avery Weigh-Tronix csenneff@awtx-itw.com	Mr. Jeff Gibson Ph: 740-507-6343 jeff.gibson@ncwm.com

NTEP Electric Vehicle Supply Equipment (EVSE) Work Group:
The NTEP EVSE Work Group has not met in several years. At the conclusion of the 2026 NCWM Annual Meeting it is anticipated that the Work Group will need to schedule a meeting to update the NTEP Evaluation Checklist to include any items adopted during the previous Annual Meetings. As the Work Group Meeting is not yet scheduled, please contact the Work Groups Chair and/or the NTEP Administrator for additional information:

Workgroup Chair	NTEP Administrator
Mr. Andrei Moldoveanu NEMA And_Moldoveanu@nema.org	Mr. Jeff Gibson Ph: 740-507-6343 jeff.gibson@ncwm.com

CAP – CONFORMITY ASSESSMENT PROGRAM

CAP-1 I Conformity Assessment Program

The Conformity Assessment Program was established to ensure devices produced after the device has been type evaluated and certified by NTEP continue to meet the same requirements. This program has three major elements: 1) Certificate Review (administrative); 2) Initial Verification (inspection and performance testing); and 3) Verified Conformity Assessment (influence factors). This item is included on the Committee's agenda to provide an update on these elements.

Certificate Review:
Certificates are constantly under review by NTEP staff and laboratories. Many active certificates are amended annually because of manufacturer submission for evaluation or issues reported by the states pertaining to information on the certificate. When the devices are re-evaluated and certificates are amended, all information is reviewed, and necessary steps are taken to ensure compliance and that accurate, thorough information is reported on the certificate to keep certificate information up to date, the Committee continues to offer an opportunity for active certificate holders to update contact information that is contained in the "Submitted By" box on certificates. This is offered during the payment period of their annual maintenance fee. Many CC holders have taken advantage of the opportunity for hundreds of NTEP certificates.

Initial Verification (IV):
The IV initiative is ongoing. Field enforcement officials perform an initial inspection and test on new installations on a routine basis. The Committee recognized that the states do not want IV reporting to be cumbersome.

An IV report form was developed several years ago. The Committee desired a simple form, perhaps web-based for use by state and local regulators. The form was approved by the Committee and distributed to the states. A completed form can be submitted via mail, e-mail, fax, or online. The forms are available on the Conformity Assessment Program web page at www.ncwm.com/conformity-assessment, or on the Forms web page at www.ncwm.com/helpful-forms, or by contacting the NCWM at info@ncwm.com or the NTEP Administrator at jeff.gibson@ncwm.com.

NTEP has acknowledged that the state, county, and city regulators have not bought into the IV report form. Industry representatives stated that IV is very important to ensure conformity assessment and the NCWM should push harder for reporting of non-compliance issues found during IV.

NTEP is open to suggestions on how to improve the reporting of non-compliant devices found during initial verification.

VCAP:
NCWM has been concerned about production meeting type and protecting the integrity of the NTEP Certificate of Conformance (CC) since the inception of NTEP. The NCWM Board of Directors has consistently reconfirmed its belief that conformity assessment is vital to NTEP's continued success.

Nine weighing device categories subject to influence factors, as defined in *Handbook 44*, were identified and are subject to VCAP audits. Certificate holders for these device types are required to have an on-site audit of the manufacturer's quality system and on-site random and/or review of a production device by an outside auditor to verify compliance with VCAP. The NTEP Committee and NCWM Board agreed not to include weighing/load receiving elements using NTEP load cells in the list of device categories subject to VCAP. However, the Board notified certificate holders that they have no intention of amending the table of devices subject to influence factor testing found in the Weighing Devices Section of *NCWM Publication 14*.

The Committee has received letters, questions, and many other inquiries pertaining to VCAP. The Committee has worked diligently to answer the questions submitted in a very timely manner. The Committee knows that additional questions will be posed as VCAP progresses. Certificate holders and other interested parties are encouraged to submit written questions to the NTEP Committee. The Committee is pleased to report that it has been successful in answering all the questions to date. Clerical changes and additions have been made to affected VCAP documents as deemed necessary.

Load cells traceable to NTEP certificates were selected for the initial assessment effort. NCWM elected to require a systems audit checklist that is to be completed by an outside auditor and submitted to NCWM per Section 21.3.3.3.5 of the VCAP requirements. A VCAP Systems Audit Checklist for Manufacturers and a VCAP Systems Audit Checklist for Private Label Certificate Holders have been developed and are available on the website at www.ncwm.com/vcap. Additionally, the Committee developed a new *NCWM Publication 14,* Administrative policy to distinguish between the requirements for parent NTEP certificate holders (21.3.2) and private label certificate holders. The requirements in 21.3.3.7 track the private label checklist requirements: traceability of the private label NTEP CC to its parent NTEP CC, traceability of the parent NTEP CC to a VCAP audit, purchase and sales records, plan to report non-conforming product and non-conforming product in stock, plan to conduct internal audits to verify non-compliance action, and internal audit records.

VCAP Audits:
The Committee had discussions about the required number of audits for facilities that manufacture multiple device types. For example, if a company had successful audits for two device types, they might submit a request for a delay from audit requirements for remaining device types, stating that they are all subjected to the same processes and will be audited in the next cycle. The Committee agreed to the request in principal and directed the NTEP Administrator propose a change to the VCAP Policy language. This change was adopted by the NCWM Board in 2013.

ADM – NCWM PUBLICATION 14, ADMINISTRATIVE POLICY

ADM-23.1 I Acceptance of OIML-CS Test Reports Issued for Devices Evaluated to the OIML R117 Recommendation for Issuing NTEP Certificates of Conformance.

Source:
Meter Manufacturers Association

Purpose:
Recommend that NCWM enter into the OIML-CS for OIML R117 as a Utilizer, thus allowing NCWM to accept test reports for the purpose of issuing NTEP Certificates of Conformance for liquid measuring devices. NTEP will specify in its Declaration any additional national requirement in the U.S. for liquid measuring devices. All NTEP fees

still apply and additional evaluation may be required at the discretion of the NTEP Administrator. 16

Item Under Consideration:
Amend Pub 14 Administrative Policy as follows.

> **7.2. Certification System (OIML-CS)**
> The International Organization of Legal Metrology Certification System (OIML-CS) is a voluntary system by which national issuing authorities or national responsible bodies within OIML Member States and Corresponding Members accept and utilize OIML Test Reports or OIML Type Evaluation Reports, for type approval or recognition in their relevant national or regional metrological control programs.
>
> The United States is a Member State in OIML and therefore is able to participate in the OIML-CS. The U.S. State Department has designated NIST, OWM to represent the U.S. in OIML. NIST, OWM has identified NCWM as the National Issuing Authority for the U.S. for OIML R76 (nonautomatic weighing instruments) and OIML R60 (metrological regulation for load cells) because NCWM administers NTEP. NCWM is also the National Issuing Authority for other weighing and measuring devices in the US. The NCWM is the active National Issuing Authority for R60 in a Declaration under the OIML-CS.
>
> By signing a Declaration, a National Issuing Authority declares confidence in the test results issued by Testing Laboratories that are designated by OIML Issuing Authorities under the OIML-CS. Participants in the OIML-CS are of two kinds:
>
> 1. OIML Issuing Authorities, which issue OIML Certificates and associated Type Evaluation Reports (they will provide evidence of competence, impartiality and quality).
>
> 2. Utilizers, which do not issue OIML Test Reports, but which accept OIML Test Reports or OIML Type Evaluation Reports as the basis of issuing corresponding National Type Evaluation Certificates.
>
> NCWM has entered into the OIML-CS for OIML R60 **and R117** as a Utilizer, thus allowing NCWM to accept test reports for the purpose of issuing NTEP Certificates of Conformance for load cells **and dynamic measuring systems for liquids other than water**. [Note: NCWM had previously participated in the Mutual Acceptance Arrangement (MAA) for OIML R60 load cells. The Certificate System replaced the MAA.] NTEP has specified in its Declaration that there is an additional national requirement in the U.S. for Class III L. All NTEP fees still apply, and additional evaluation may be required at the discretion of the NTEP Administrator.

Additional Information:
Per Pub 14 Administrative Policy, NCWM has the ability to enter into the OIML-CS for declaring its acceptance of a test report(s), issued by an authorized testing laboratory, based on the evaluation of a device to the OIML R117 International Recommendation as a Utilizer, thus allowing NCWM to accept test reports for the purpose of issuing NTEP Certificates of Conformance for liquid measuring devices.

Before this proposal is considered, a work group would need to be formed and charged with documenting any requirement that is currently in the Publication 14 Checklist that is not in the R117 recommendation. This document would be included in the declaration of additional national requirements in the U.S. The OIML-CS test report would need to include the results of the evaluation to these additional national requirements. (Note, once the differences are identified, OIML-CS Test Laboratories should be contacted for their agreement and confirmation of capabilities to perform the additional testing, if any.) If OIML-CS Test Laboratories are unable to perform all tests specified in Publication 14 Checklist, the additional tests will be performed by NTEP.

The submitter provided the following information on possible opposing arguments to this proposal.

Opposing Argument 1: This might take work away from NTEP labs.

Rebuttal:

- NTEP labs are not always available for required testing.
- There might not be test facilities readily available in the US.
- NTEP labs would still need to review test reports and conduct gap analysis to HB44 and possibly conduct additional tests.
- This proposal would reduce NTEP travel expenses, which would benefit the manufacturers and NTEP labs.
- This proposal would reduce the test cost for manufacturers, and these savings can be passed on to the end user/public.

Opposing Argument 2: This might allow unscrupulous manufacturers to sell products to US consumers.

Rebuttal:

- OIML-CS system is a well-defined and strictly controlled system with qualified and certified testing authorities.
- Only OIML-CS test reports are eligible for submission to NTEP, and it will be still NTEP's decision which tests reports are acceptable based on the HB44 requirements.
- Test reports can be accepted in full or in part. In the latter case, additional tests by NTEP may be required. 30

NCWM 2023 Annual Meeting: The Committee received comments from two manufacturers and a representative of the Meter Manufacturers Association in support of the item and offered any support needed to move this item along.

NCWM 2024 Interim Meeting: The Committee heard support for this item from Dmitri Karimov representing the Meter Manufacturers Association. Mr. Karimov stated that the members of the Meter Manufacturers Association were willing to participate in any work necessary to develop a gap analysis document. The Committee also heard support for this item from Michael Keilty from Endress + Hauser Flowtec, AG, USA.

NCWM 2024 Annual Meeting: Dmitri Karimov, IDEX Energy supported the item and mentioned that there is strong support for the item from NIST-OWM. Dmitri commented that this would result in lower cost for manufacturers, and quicker time to market. Acceptance of the OIML data is voluntary, and NTEP would have the option of not accepting the test data if they did not want to. Not all data will be accepted as there are differences between NIST HB44 and OIML, such as permanence testing which will result in the need for some NTEP testing. Dmitri speaking for the Meter Manufacturers Association stated that the Meter Manufacturers Association supports this item. Michael Keilty, Endress + Hauser Flowtec, AG, USA; supported the item and commented that it is becoming harder for manufacturers to participate in the marketplace; it is difficult to find labs that do material-specific testing. NTEP and OIML are both needed and recognizing international data is important to manufacturers.Marc Buttler Emerson – Micro Motion supports the proposal and feels it adds value to the manufacturer. He commented that additional NTEP requirements can still be applicable. John Hathaway, Murry Equipment: In general, supports the proposal. However, he is concerned that some products have been evaluated and approved in other countries that are not to the level of their peers. He recommends that NTEP scrutinize new products from overseas before they are entered into the US Market.

NCWM 2025 INTERIM MEETING: The committee heard support and opposition to this item during open hearing testimony. John Hathaway Total Control is concerned about the item; there are some positives and negatives, but the negatives outweigh the positives. NTEP procedures during testing if OIML is used. Dimitri Karimov liquid controls support passing. Dimitri Karimov Liquid Controls wants NTEP to review the data and decide whether to accept or decline. Liquid Controls views it as a bonus for NTEP. California wants to withdraw and needs to remain NTEP. Jim Pettinato Guidant supports the item, which will benefit NTEP. Michael Keilty Endress & Hauser Flowtec, AG, USA support items, makes items easier to test, and does not stop "hands-on" testing from NTEP.

NCWM 2025 ANNUAL MEETING: Dimitri Karamov - Liquid Controls In Support. John Hathaway - Murray

Equipment - Against. Discourages NTEP & Board from adopting OIML. Expressed concerns that there are questionable products being approved by OIML. These substandard products could enter U.S. markets. Keep the robust U.S.- based testing and approval system with NTEP. Michael Kielty, Endress+Hauser, in Support Mass flow meters for Cryogenic liquids face difficulties finding labs capable of testing. MFM for high-capacity oil and high flows also face challenges. Recommend accepting OIML data by applying scrutiny and only recognizing specific labs that have been vetted for quality and accuracy. Supports this item although he would assume that NTEP would continue to test, however NTEP could utilize OIML labs for new products. NTEP could endorse labs that offer testing on devices that NTEP does not cover

National Propane Gas Association in Support. LPG is not a significant enough market to warrant cost of NTEP testing for current manufacturers of propane gas meters. OIML approval can fill the gap to support limited U.S. market.

Alison Wilkinson - Maryland Dept. Ag. Neutral. Stated that NCWM needs to protect NTEP stated that she sees both points being made. It is critical to ensure the integrity of the NTEP program and suggested further evaluations be done regarding the proposal.

ADM-24.2 I Implement Software Version Change Policy

Source:
NTEP Administrator

Purpose:
To develop a new Policy Statement and Application for informing NTEP of an update to metrological features and/or functions in the software of an NTEP certified device or software-only application where the change modified the Software Version Identification.

Justification:
Prior to January 2022 Handbook 44, General Code, paragraph G-S.1. (d) required that all not-built-for-purpose, software based devices manufactured beginning on January 2004 must identify the software version or revision number. NTEP has been including the software version identifier on CCs issued to not-built-for-purpose, software based devices after this date.

On January 2022 this paragraph was amended to require all software-based devices to have a software revision or version identifier. NTEP has been including the software version identifier on CCs issued to all software-based devices after this date.

It did not take very long to realize that manufacturers are not submitting an application when the software version changes and soon the version identifier list of the certificate was in question. One solution was to use the term “or higher” which was adopted in 2004. However, this has only led to confusion and concern in the field. Devices were found with a different version format than what was listed on the Certificate of Conformance. During some research, NTEP learned that the “higher” version identifier actually represented metrological changes being made to the device without notifying NTEP of the change.

The following proposal is an attempt to change the current practice and bring control to the software version Identification issue.

In support of this new policy, a new “Software Version Identifier Update” application has been created. There will be a fee associated with this application with the amount to be set by the NCWM Board of Directors.

Item Under Consideration:
In Publication 14, NTEP Administrative Policy – insert the following new policy statement as section 15 and renumber all remaining sections.

15. Maintaining the Latest Software Version Identifier on the NTEP Certificate of Conformance

All NTEP Certificates of Conformance issued to all software-based devices after January 1, 2022, have the software version identifier listed. It is imperative that you inform NTEP of any change to the version identifier that indicates a change to the software related to the metrological features and/or functions of the device. Devices found in the field, in a commercial or legal-for-trade application, with a metrological software version identifier not listed on the certificate of conformance for the device, will be considered not traceable to the Certificate of Conformance and subject to actions by the local weights and measures jurisdiction.

To inform NTEP of the change to the software version identifier, complete and submit a completed Software Version Identifier Update Application.

The intent of this policy is to amend the Certificate of Conformance to list all NTEP certified software version identifiers for the device or devices listed on the Certificate of Conformance. NTEP will provide the manufacturer with a draft of the amended Certificate of Conformance for their review and approval before the Certificate of Conformance is released for publishing. The manufacturer needs to be aware that the review of the software changes could lead to the need to have the device reevaluated.

NCWM 2024 Interim Meeting: The Committee heard comments from Michael Keilty from Endress + Hauser lowtec, AG, USA, that NTEP should define how the software version control is represented so that there is similarity across device types. Similar comments were heard from Steven Harrington, Oregon, and Keith Bradley, Squire Patton Boggs. Mr. Bradley also mentioned that there could be a conflict with the proposed wording; in the second sentence, it identifies the software in question to be the software related to the metrological features and functions of the device, while in the fourth sentence, the term "software" is not defined as being metrological software. Darrell Flocken, NTEP Administrator, mentioned that this item is a clarification of an existing NTEP Policy requirement and suggested that the output of the Software Sector has provided some guidance for this in Publication 14, Software Sector. Darrell also agreed with the conflict in the proposed wording and added the word "metrological" into the fourth sentence.

NCWM 2024 Annual Meeting: The Committee heard from Michael Keilty, Endress + Hauser Flowtec, AG, USA; Michael identified a typo in the third sentence of the proposal and commented that he looks forward to discussing this item in more detail at the Measuring Sector Meeting in September.

Devices found in the field, in a commercial or legal-for-trade application, with a metrological software version identifier not listed on the certificate of conformance for the device, will be considered not traceable to the certificate of conformance and subject to actions by the local weights and measures jurisdiction.

Dimitri Karimov, IDEX Energy, voiced concerns regarding the additional work this proposal would create for NTEP. With the potential of 100's of applications per month, he is concerned that this would create a backlog for NTEP which could cause delays in the manufacturer releasing new software versions. Michael Keilty voiced his concern that the proposed language would trigger a revision to the certificate. Michael went on to explain that Measurement Canada responds to software changes by issuing a letter of approval, they do not amend the certificate. He added that this would create undue expenses and burden NTEP with additional work and he does not like that an application is needed for every little change. Marc Buttler, Emerson – Micro Motion suggested that a list of all software versions, both past and present, be listed. Measurement Canada currently maintains a record of all certificate revisions.

NCWM 2025 Interim Meeting: Dimitri Karimov Liquid Controls is indifferent and wants the process to be quick. Michael Kelty supports the change and wants it well thought out. California supports helping clarify software validation. The software sector supports this. Maryland supports items that will help states with enforcement. Murray Equipment supports, and Gilbarco supports.

NCWM 2025 Annual Meeting: Michael Keilty – Endress + Hauser – Supports the concept but NTEP might want to consider the program used in Canada. A simple change could be a letter which would be adequate to address this and should be offered at a reasonable cost.

Justin Wilson ChargePoint. Neutral. Concerns about implementation. Suggests a delayed implementation for manufacturers to prepare. Field devices have a wide variety of software environments. Need a process to make software modifications without a full CoC review again.

Alison Wilkinson Strongly support this item. Have found multiple flaws in software where metrological changes are occurring. New models are being introduced without review. Urge other states to review CoCs more closely has seen multiple problems. We should all be ensuring that devices are complying.

Matt Douglas. Supports comments from MD. Need to identify portion of software code (version number) that is allowed to increment without creating a sealable event or need to update certificate.

ADM-25.1 I Addition of Water Meters to the Verified Conformity Assessment Program

Source:
NTEP Administrator

Purpose:
Modify the current Verified Conformity Assessment Program Policy to include water meters in the list of covered devices.

Justification:
California has reported a high failure rate related to the performance of NTEP-certified water meters. The Verified Conformity Assessment Program is designed to require additional in-house testing and document verification to show proper control of design changes and component purchasing guidelines. By adding these devices to the Verified Conformity Assessment Program, NTEP would perform audits to ensure continued compliance. This will result in fewer failures during the initial verification inspection.

Item Under Consideration:
Amend Pub 14 Administrative Policy as follows.

21.1.3. NTEP Verified Conformity Assessment Program Procedures

Many NTEP-certified devices must meet *NIST Handbook 44* requirements for influence factors. It is not possible to verify these requirements during the Initial Verification in the field. Therefore, manufacturers of metrological devices (instruments) and/or components (modules) which are ~~**subject to influence factors, as defined in *NIST Handbook 44***~~**identified in paragraphs 21.1.3.1., and 21.1.3.7**, must have a Verified Conformity Assessment Program (VCAP) in place to ensure that these metrological devices and/or components are produced to perform at a level consistent with that of the device and/or component previously certified. The Verified Conformity Assessment Program audit will be at one or more sites as required to verify compliance.

For weighing devices that are subject to influence factors **and other devices identified in paragraphs 21.1.3.1., and 21.1.3.7**, NTEP will require an initial on-site audit of the manufacturer's quality system and on-site random testing and/or review of a production device(s) (instrument(s)) by the Registrar to verify that all items listed below are currently implemented and functioning to verify compliance to the appropriate sections of *NIST Handbook 44*.

…

21.1.3.1. Devices that Must Meet this Requirement are Limited to the List Below:

- Load Cell (T.N.8.)
- Indicating Elements (T.N.8.)
- Weighing/Load Receiving Elements 2000 lb capacity and less with non-NTEP Load Cells (T.N.8.)

- Complete Scales 2000 lb capacity and less (T.N.8.)
- Automatic Weighing Systems 2000 lb capacity and less (T.7.)
- Belt-Conveyor Scales (weigh-belt systems only) 2000 lb capacity and less (T.3)
- Automatic Bulk Weighing Systems 2000 lb capacity and less (T.7.)
- Multiple Dimension Measuring Devices (T.5.1.)
- Grain Test Scales (T.N.8)
- **Water Meters**

21.1.3.7. Devices that Must Meet this Requirement are Limited to the List Below:

- Load Cell (T.N.8.)
- Indicating Elements (T.N.8.)
- Weighing/Load Receiving Elements 2000 lb capacity and less with non-NTEP Load Cells (T.N.8.)
- Complete Scales 2000 lb capacity and less (T.N.8.)
- Automatic Weighing Systems 2000 lb capacity and less (T.7.)
- Belt-Conveyor Scales (weigh-belt systems only) 2000 lb capacity and less (T.3)
- Automatic Bulk Weighing Systems 2000 lb capacity and less (T.7.)
- Multiple Dimension Measuring Devices (T.5.1.)
- Grain Test Scales (T.N.8)
- **Water Meters**

NCWM 2025 Interim Meeting: Los Angeles County supports the item, they have a 20% failure rate, and the State of California supports the item, meters have a high failure rate. San Diego County's high failure rate has data; Dimitri Liquid Controls does not support it; Orange County supports adding water meters to VCAP;

NCWM 2025 Annual Meeting: Dimitri Karamov, Liquid Controls, Opposed - recommend withdrawal. Methods for testing are not consistent. Different labs will pass some devices that other labs failed. MMA Sending Comments

Badger Meter – submitted letter recommending withdrawal. Represents American water works. Submitted a letter suggesting withdrawn status. If VCAP is implemented, then the meters will just pass again when tested at the manufacturers site He stated that water meters don't fall under normal weighing and measuring devices.

Michael Kielty, Endress+Hauser. In opposition recommend withdrawal. It is unclear whether the problem is not in the lab procedure. Instead of doing this, first we should evaluate where the problem is. Visit manufacturers sites informally to figure out where the problem is. This won't resolve the issue.

Jose Arriaga, Orange County CA. Support. Will accept verified data from other labs. Orange county alone has over 1 million meters. Not addressing this keeps the burden on the service agents and users of the devices. Would like to see data from other states who are testing water meters. This is a big issue. Large number of failures right out of the box. Uniform testing procedures are being followed. This could be a nationwide issue.

Matt Douglas, State of California. Support just in one county (Orange) has witnessed a large number of failures.

Lina Ng, Los Angeles County, California. In Support. Echoes comments from Orange County and State of California. Personal experience with testing the meters. Sometimes brand-new shipments don't even meet marking and sealing requirements from NTEP. Lots of problems with brand new, aside from the performance accuracy.

John Bell, Ventura County, California. In Support. Water use is critical in California. Water meters have had major issues for ten years. This measure is a good start to address the issues. Worked as an inspector and saw the same problem with water meter failures. CA laws encourage more efficient water use. This can also affect other states. This item is a good start to get more consistency with water meters.

Austin Shepard, San Diego County, California. In Support. Echoes statements from other California counties and the State. San Diego County met with water manufacturers and established the same test procedures in the San Diego lab – still seeing high failure rates.

OTH – OTHER, A PLACE TO CAPTURE NON-TECHNICAL COMMENTS OR SUGGESTIONS INTENDED TO IMPROVE THE NATIONAL TYPE EVALUATION PROGRAM

OTH-1 - Document the History of the National Type Evaluation Program

During the 2024 NCWM Interim Meeting, Mr. Randy Jennings, who is retired, suggested that the history of the National Type Evaluation program be written and made available for download from the NCWM.com website.

A few individuals provided comments in support of such a document and mentioned that several NCWM newsletter articles have been written on this subject over the years. Darrell Flocken, NTEP Administrator, commented that, with the NTEP Committee's agreement, he would develop and publish the document.

An initial article related to the history of NTEP was published in the third edition of the 2024 NCWM Newsletter.

NCWM 2025 Interim Meeting: The third newsletter of 2024 has an article on the history of NTEP. This article will be expanded upon and added to the NTEP page or a suitable page on the National Council on Weights and Measures website.

Mr. Marc Paquette, Vermont | Committee Chair Mr.
Jason Flint ,New Jersey | Member
Mr. Kevin Schnepp, California | Member
Mr. Daniel Walker, Ohio | Member
Mr. Paul Floyd, Louisiana | Member
Mr. Jeff Gibson, NCWM | NTEP Administrator

National Type Evaluation Program Committee

Appendix A

NTEP Statistics Report

(As of September 30, 2024)

General NTEP Statistics	Last Year	This Year
	10-01-22 to 9-30-23	10-01-23 to 09-30-24
Total Applications Processed	(64) 302	(50) 309
Applications Completed	301	313
Certificates Issued	297	295
Active NTEP Certificates		2409

( ) = Reactivations

Assignments to Labs per Year	10-01-22 to 9-30-23	10-01-22 to 09-30-24
California	0	(4) 13
Canada	1	0
FGIS-IL	0	0
FGIS-KC	9	9
Kansas	1	1
Maryland	0	(2) 4
New York	2	0
NIST Force Group	1	2
North Carolina	2	2
Ohio	(4)65	(2) 64
Oregon	0	0
NTEP Staff	(24) 251	(8) 217
Applications Not Yet Assigned to a Lab	0	1

( ) = Reassignments from another lab

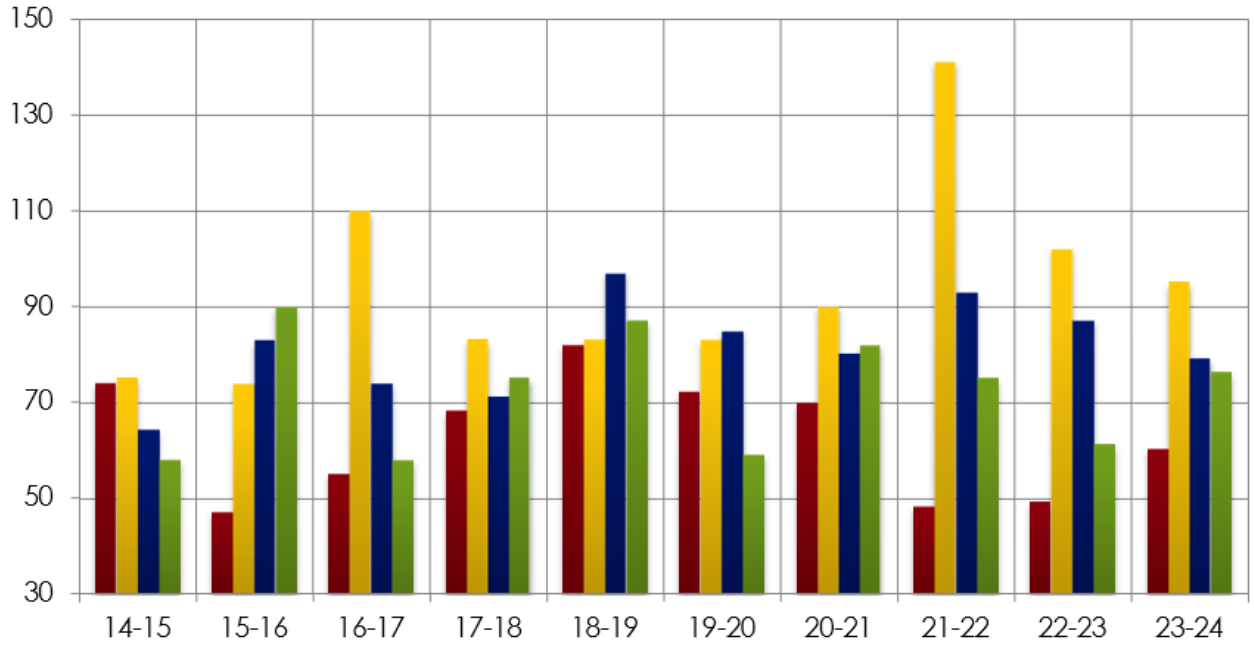
Process Statistics	Last 5 Years
Average Time to Assign an Evaluation	5.8 Days
Average Time to Complete an Evaluation	66.1 Days

Report on Evaluations in Progress

Evaluations in Progress	0-3 Months	3-6 Months	6-9 Months	9-12 Months	Over 1 Year	Total
December 31, 2019	35	23	17	6	10	91
February 29, 2020	43	19	16	8	11	97
June 30, 2020	61	28	14	7	11	121
September 30, 2020	36	28	18	8	18	109
March 31, 2021	28	12	9	14	21	84
June 30, 2021	48	9	6	5	16	84
August 20, 2021	56	18	5	7	13	99
December 31. 2021	22	22	23	4	14	85
March 31, 2022	77	8	16	17	14	132
May 31, 2022	69	35	10	12	17	143
September 30, 2022	48	36	16	10	17	127
March 10, 2023	71	21	10	19	25	146
June 19, 2023	92	16	6	7	16	101
September 30, 2022	42	25	11	3	11	92
December 20, 2023	36	23	20	8	13	100
February 29, 2024	40	19	16	9	14	98
June 6, 2024	49	21	11	6	16	103
September 18, 2024	**51**	**28**	**9**	**5**	**14**	**107**

In Progress by Lab	0-3 Months	3-6 Months	6-9 Months	9-12 Months	Over 1 Year	Total
California	2		1		2	**5**
Canada						
FGIS-IL						
FGIS-KC	1	8				**9**
Kansas					1	**1**
Maryland	2	1				**3**
New York						
NIST Force Group	1		1			**2**
North Carolina						
Ohio	7	7	2		1	**17**
Oregon				2		**2**
NTEP Staff	28	12	5	2	10	**57**
Unassigned	10			1		**107**
					Total Pending:	**103**

10-Year Report on Applications Received by Quarter



	14-15	15-16	16-17	17-18	18-19	19-20	20-21	21-22	22-23	23-24
Oct – Dec	74	47	55	68	82	72	70	48	49	60
Jan – Mar	75	74	110	83	83	84	90	141	102	95
Apr – Jun	64	83	74	71	98	85	80	92	87	79
Jul - Sep	58	90	58	73	87	59	82	75	64	76
Total	**271**	**294**	**297**	**295**	**350**	**300**	**322**	**356**	**302**	**310**

Average Per Quarter: 10-YR: **77.4**

Average Per Quarter This FY: **78.0**

Average per Year: **310**