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PUBLICATION 16

**111TH ANNUAL MEETING
of the
NATIONAL COUNCIL ON WEIGHTS AND MEASURES**

**PHILADELPHIA, PENNSYLVANIA
JULY 26 - 30, 2026**

**COMMITTEE AGENDAS FOR THE
2026 ANNUAL MEETING**

N C W M
PUBLICATION
16

Agenda for the
111th ANNUAL MEETING
of the
National Council on Weights and Measures
Philadelphia, Pennsylvania / July 26-30, 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

OFFICE OF
WEIGHTS AND MEASURES



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 to hear and discuss subjects related 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) has 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 Schnepf, NCWM Chair
California



Welcome members and guests to the 111th Annual Meeting of the National Council on Weights and Measures in historic Philadelphia, Pennsylvania. Many of you may recall that Philadelphia was also the site for NCWM's 100th Annual Meeting. I cannot think of a more fitting venue to tackle the serious work of NCWM during our nation's semi-quintecennial, celebrating the 250th anniversary of the United States Declaration of Independence.

I hope that you can take some time to visit and learn more about Philadelphia, a city over 340 years old. Well-known as the birthplace of the Declaration of Independence, home to the Liberty Bell, Independence Hall, the nationally known Philly cheesesteak, and their lively Major League baseball mascot—the Philly Phanatic. Philadelphia offers so much more, so take some time to learn something else about this iconic city.

Our agenda kicks off on Sunday morning with meetings of the various subcommittees and task groups. Please attend as many of these meetings as possible to get current information on projects, agenda items, and responsibilities assigned to each task group or subcommittee. The work of our members through the subcommittees and task groups is vital to the success of NCWM and greatly supports the standing committees and the Board of Directors, to whom they report. Sunday evening is a time for networking and preparing for the days ahead. Please join me at the Chair's Reception for some good food and libations to get our work week off to a great start.

Monday and Tuesday of this week, the NCWM standing committees will hold open hearings to receive editorial suggestions, statements of support or opposition, and recommendations for the final status of items on their respective agendas. Regulators, industry representatives, technical advisors, and all registered attendees are encouraged to make their positions and recommendations known on each agenda item that is important to them. The open hearings provide a forum for discussion and debate, where disagreement is listened to with the intent of always understanding and compromising where practical.

Tuesday afternoon following open hearings, NCWM will have the awards celebration. There are several members being recognized for their dedication and service to NCWM, and you may be one of them. Please join us as we recognize these members and applaud their achievements.

The committees will then adjourn for their work sessions to deliberate on the status of items and determine which items will be voted on during our voting sessions. Remember that some agenda items that were assigned voting status at January's Interim Meeting may be downgraded prior to Wednesday's voting session based on comments and recommendations heard during open hearings, but no item can be elevated to voting status that was not assigned that status at the Interim.

During the voting session, the adoption or rejection of agenda items will determine what appears in the 2027 version of Handbooks 44, 130, and 133. Some items may pass or fail by a thin margin, so every vote counts. Voting members, please make sure to attend the entirety of the voting sessions and cast your official vote for each item as it is presented.

Thursday marks the last day of the 2026 NCWM Annual Meeting and will include a carryover of the voting session, if not completed on Wednesday, as well as our annual business meeting welcoming Jason Flint of New Jersey as he steps into his role as incoming NCWM Chair.

I look forward to the meetings, discussions, and deliberations that will guide each of our standing committees and inform our voting decisions. While we face the challenges ahead, I want to remind you that no challenge is insurmountable when faced with commitment, integrity, consistency of effort, and a steadfast commitment to high ethical standards. Our commitment to preserving and protecting equity in the marketplace by "measuring what matters" will help us successfully face our challenges.

Sincerely,

A handwritten signature in dark ink that reads "Kevin Schnepf". The signature is fluid and cursive, with the first name "Kevin" being more prominent.

Kevin Schnepf
NCWM Chair

Table of Contents

Title	Page
Schedule of Events	iii
Organization Chart	ix
Past Chairmen.....	xxv
General Information	GEN – 1
Purpose	GEN – 1
.....	GEN – 1
Supporting Documents	GEN – 1
Items Grouped into Blocks	GEN – 1
Designation of Item Status.....	GEN – 1
Addendum Sheets	GEN – 2
Voting System	GEN – 2
Written Comments or Oral Statements.....	GEN – 3
Participation.....	GEN – 3
.....	GEN – 3
Reports.....	GEN – 3
.....	GEN – 3
Interim Meeting	GEN – 4
Units of Measurement	GEN – 4
Board of Directors	BOD – 5
Laws and Regulations Committee	L&R – 27
Specifications and Tolerances Committee.....	S&T – 147
Professional Development Committee	PDC – 333
National Type Evaluation Program Committee.....	NTEP – 351
Nominating Committee	NOM – 367

111th NCWM Annual Meeting

Schedule of Events

The schedule of events is tentative and subject to change

Sunday, July 26, 2026		
8:00 a.m. – 9:30 a.m.	Coffee Service	Grand Foyer
8:00 a.m. – 5:00 p.m.	Registration and Exhibits	Grand Foyer
Subcommittee and Task Group Meetings		
9:00 a.m. – 11:30 a.m.	Meter Manufacturers Association	Reynolds
9:00 a.m. – 11:30 a.m.	CALM: Community for All Legal Metrologists	Ballroom A
9:00 a.m. – 10:15 a.m.	Milk Meter Tolerance Task Group	Bromley
9:00 a.m. – 10:15 a.m.	MEMS: Member Education & Mentorship Subcommittee	Shippen
10:30 a.m. – 11:30 a.m.	EVSE Task Group	Bromley
10:30 a.m. – 11:30 a.m.	PALS: Packaging and Labeling Subcommittee	Shippen
11:30 a.m. – 1:00 p.m.	Lunch on Your Own	
Subcommittee and Task Group Meetings		
1:00 p.m. – 3:45 p.m.	FALS: Fuels & Lubricants Subcommittee	Ballroom A
1:00 p.m. – 2:15 p.m.	Metrology Subcommittee	Reynolds
1:00 p.m. – 2:15 p.m.	Women in Weights & Measures	Bromley
1:00 p.m. – 2:15 p.m.	Safety Subcommittee	Shippen
2:30 p.m. – 3:45 p.m.	Cannabis Task Group	Reynolds
2:30 p.m. – 3:45 p.m.	Moisture Allowance Task Group	Bromley
2:30 p.m. – 3:45 p.m.	Training Planning Task Group	Shippen
<i>Last EVSE Event East Coast Fall 2026</i>		
4:00 p.m. – 5:00 p.m.	Joint Committee Review	Ballroom
5:30 p.m. – 7:00 p.m.	NCWM Chair's Reception	Hamilton

Monday, July 27, 2026		Room
7:00 a.m. – 8:30 a.m.	Light Breakfast	Grand Foyer
7:00 a.m. – 5:00 p.m.	Registration and Exhibits	Grand Foyer
8:00 a.m. – 8:30 a.m.	New Attendee Orientation	Ballroom
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 Presiding Officer: Matt Douglas, California Professional Development Committee Specifications and Tolerances Committee Laws and Regulations Committee NTEP Committee Board of Directors	Ballroom
12:00 p.m. – 1:30 p.m.	Lunch on Your Own	
1:30 p.m. – 5:00 p.m.	Official Session – Open Hearings Continued	Ballroom
1:30 p.m. – 5:00 p.m.	Committee Work Sessions Professional Development Committee Specifications and Tolerances Committee Laws and Regulations Committee Board of Directors / NTEP Committee	Reynolds Ballroom A Bromley Shippen

Tuesday, July 28, 2026		
7:00 a.m. – 8:30 a.m.	Light Breakfast	Grand Foyer
7:00 a.m. – 5:00 p.m.	Registration and Exhibits	Grand Foyer
Committee hearings will occur in the order presented below. Hearing times are not firm; when one committee finishes, the next committee will begin. Committee chairs reserve the right to group items and select their sequence for presentation on voting.		
8:00 a.m. – 9:45 a.m.	Official Session – Open Hearings (continued as necessary) Presiding Officer: Christina Osborn, Texas	Ballroom
9:45 a.m. – 10:00 a.m.	Break	
10:00 a.m. – 12:00 p.m.	General Session Pledge of Allegiance and Invocation Chaplain: Scott Simmons, Retired Welcome Address Speaker: TBD Honorary President’s Address NIST Director NCWM Chair’s Address Speaker: Kevin Schnepf, NCWM Chair Awards Ceremony	Ballroom
12:00 p.m. – 1:30 p.m.	Lunch on Your Own	
1:30 p.m. – 5:00 p.m.	TESCO Factory Tour A guided walk through TESCO's manufacturing and calibration areas, demonstrations of meter and EVSE testing equipment, and an overview of TESCO's solutions supporting weights & measures and utilities. Advanced signup is required.	Reserve your spot today!
1:30 p.m. – 3:00 p.m.	Technical Session: TBD	Ballroom
1:30 p.m. – 5:00 p.m.	Committee Work Sessions Professional Development Committee Specifications and Tolerances Committee Laws and Regulations Committee Board of Directors / NTEP Committee	Reynolds Ballroom A Bromley Shippen
8:00 p.m.	Addendum Sheets Available (<i>hardcopies</i>) <i>Electronic copies are available earlier here & on our meeting app</i>	Grand Foyer

Wednesday, July 29, 2026		
7:00 a.m. – 8:30 a.m.	Light Breakfast	Grand Foyer
7:00 a.m. – 3:00 p.m.	Registration and Exhibits	Grand Foyer
7:30 a.m. – 8:50 a.m.	Associate Membership Committee	Ballroom A
9:00 a.m. – 11:30 p.m.	Regional Association Meetings	
	Central Weights and Measures Association	Reynolds
	Northeastern Weights and Measures Association	Ballroom A
	Southern Weights and Measures Association	Bromley
	Western Weights and Measures Association	Shippen
11:30 p.m. – 1:00 p.m.	Lunch on Your Own	
12:45 p.m. – 1:00 p.m.	Delegates: report to the front for the voting device	Ballroom
Committee chairs reserve the right to group items and select their sequence for presentation on voting. There will be no break between committee reports; registrants should plan to attend an entire Voting Session to ensure their presence when items of interest are likely to be under consideration.		
1:00 p.m. – 4:30 p.m.	Voting Session	Ballroom
	Presiding Officer: Sherry Turvey, Kansas	
	Parliamentarian: Chuck Corr, Retired	
	Professional Development Committee	
	Specifications and Tolerances Committee	
	Laws and Regulations Committee	
6:00 p.m. – 9:00 p.m.	Special Event: Citizens Bank Park – Home of the Phillies	
	Meet in the hotel lobby at 5:30 p.m.	
	An exclusive evening just for us – transportation, open bar, buffet dinner, time to soak in the magic of this legendary ballpark, and behind-the-scenes tours!	

Schedule of Events

Thursday, July 30, 2026

7:30 a.m. – 8:30 a.m.	Light Breakfast	Grand Foyer
7:30 a.m. – 10:00 a.m.	Registration and Exhibits	Grand Foyer

Committee chairs reserve the right to group items and select their sequence for presentation on voting. There will be no break between committee reports; registrants should plan to attend an entire Voting Session to ensure their presence when items of interest are likely to be under consideration.

9:00 a.m. – 12:00 p.m.	Voting Session (continued as necessary) Presiding Officer: Steve Timar, New York Parliamentarian: Chuck Corr, Retired NTEP Committee Board of Directors Nominating Committee Closing Ceremony Passing of the Gavel / New NCWM Chair's Address Benediction / Adjourn	Ballroom

This agenda reflects the events officially sanctioned by NCWM. Any events outside those listed in the Council agenda are not sanctioned by NCWM.

No verbatim recordings using a device such as, but not limited to, an audio or video recorder, stenotype, or stenographer are allowed. Written reports will serve as the official record for meetings.

2025-2026

Organization Chart

NCWM Board of Directors

Office	Name	Affiliation	Term Ends
NCWM Chair	<u>Kevin Schnepf</u>	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 Striejewski	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	<u>Marc Paquette</u>	Vermont	2026
NTEP Administrator	Jeff Gibson	NCWM	NA
Members	Kevin Schnepf	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

Organization Chart

Laws and Regulations Committee (L&R)

Office	Name	Affiliation	Term Ends
Chair	<u>Mauricio Mejia</u>	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	<u>Scott Wagner</u>	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	Abbott Laboratories	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	<u>Mark Lovisa</u>	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	<u>Marc Paquette</u>	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	<u>Jim Pettinato</u>	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

Organization Chart

Fuels and Lubricants Subcommittee (FALS)

Office	Name	Affiliation
Chair	<u>Vanessa Benchea</u>	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	Maresh Albuquerque	Colorado
	David Au	Georgia
	Stephen Benjamin	Retired
	David Deroche	Louisiana
	Uriel Fuentes	New Mexico
	Mike Harrington	Iowa
	Dr. Marcus Helfrich	North Carolina
	Megan McWayne	California
	Vernon Miller	Nevada
	Kevin Schnepf	California
	Bill Striejewski	Nevada
	Dr. Jenny Tabbert	Colorado
	Kevin Upschulte	Missouri
	Timothy White	Michigan
Private 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
	Tamara Paik	Marathon Petroleum
	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	<u>Brian Fuller</u>	Iowa
Public Sector Members	Cheryl Ayer	New Hampshire
	Ethan Bogren	Westchester County, NY
	Scott Ferguson	Michigan
	Dave Finck	Ohio
	Paul Floyd	Louisiana
	Valerie Forbes	Delaware
	Miland Kofford	Utah
	Christina Osborn	Texas
	Brent Ricks	Montana
	Brian Terry	Arkansas
	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	<u>Frank Greene</u>	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	<u>Chris Guay</u>	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
	Michael Smith	New York
Advisory Sector Members	Krister Hard af Segerstad	Retired
	Zina Juroch	Retired

Organization Chart

Safety Subcommittee

Office	Name	Affiliation
Chair	<u>John Satterlee</u>	Abbott Laboratories
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	<u>Cheryl Ayer</u>	New Hampshire
Co-Chair	Brandi Harder	Rice Lake Weighing Systems
Public Sector Members	Vanessa Benchea	Florida
	Teri Berken	Louisiana
	Nathalie Campeau	Measurement Canada
	Joanna Cartee	Georgia
	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	Alameda 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	<u>Evan Foisy</u>	A&D Engineering
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
Private Sector Members	Craig VanBuren	Michigan
	Jim Willis	New York
	Aaron Yanker	Colorado
	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

Organization Chart

EVSE Task Group

Office	Name	Affiliation
Chair	<u>Scott Dolan</u>	Vermont
Co-Chair	Alison Wilkinson	Maryland
NCWM Technical Advisor	Jeff Gibson	NCWM, NTEP Administrator
NIST Technical Advisor	Loren Minnich	NIST, Office of Weights and Measures
Public Sector Members	Mahesh Albuquerque	Colorado
	Jose Arriaga	Orange County, California
	Matt Douglas	California
	Jason Flint	New Jersey
	Brian Fuller	Iowa
	Sumner Kuehne	Vermont
	John Lee	New York
	Joseph Lundeen	San Bernadino County, California
	Dave Rodrigues	Massachusetts
	Nick Santori	Minnesota
Private Sector Members	Austin Shepherd	San Diego County, California
	Bill Callaway	OWL Services
	Isaac Carrera	EV Test Solutions
	Josh Cohen	Swth
	Steve Griffith	NEMA
	Michael Krauthamer	EV Advisor
	Perry Lawton	TESCO Metering
	Mal Skowron	Tesla
	Justin Wilson	ChargePoint
	Danny Zepeda	True Charge

LMD Density Correction Task Group

Office	Name	Affiliation
Chair	Andrew Montanye	Nebraska
Vice-Chair	Alison Wilkinson	Maryland
NCWM Technical Advisor	Allen Katalinic	NCWM, NTEP Evaluator
NIST Technical Advisors	John McGuire	NIST, Office of Weights and Measures
	Loren Minnich	NIST, Office of Weights and Measures
Public Sector Members	Marcus Belshe	Missouri
	Steve Carter	Illinois
	Konrad Crockford	North Dakota
	Scott Miller	Illinois
	Eric Rauch	Iowa
	Sherry Turvey	Kansas
	Scott Wagner	Colorado
	Brett Willhite	Minnesota
	Jim Willis	New York
Private Sector Members	Jim Pettinato	Guidant Measurement
	Prentiss Searles	API
Advisory Members	Chuck Corr	Retired
	Randy Jennings	Retired
	Scott Simmons	Retired

LPG Temperature Compensation Task Group

Office	Name	Affiliation
Chair	<u>Christopher Wagner</u>	NPGA
Public Sector Members	Tory Brewer	West Virginia
	Mike Brooks	Arizona
	Matt Douglas	California
	Scott Wagner	Colorado
	Kristin Walter	Arkansas
	Jim Willis	New York
Advisory Member	Scott Simmons	Retired

Training Planning Task Group

Office	Name	Affiliation
Chair	<u>Mahesh Albuquerque</u>	Colorado
NCWM	Danyelle Dolan	NCWM, Project Coordinator
	Jeff Gibson	NCWM, NTEP Administrator
	Elisa Stritt	NCWM, Director of Operations
Board of Directors	Kevin Schnepf	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	<u>Alan Walker</u>	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	<u>Aaron Yanker</u>	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	<u>Tory Brewer</u>	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
	Joseph Smith	Wisconsin
	Steve Timar	New York
	Craig VanBuren	Michigan
	Ken Vehrken	New Jersey

NCWM Standards Development Task Group

Office	Name	Affiliation
Chair	<u>Jason Flint</u>	New Jersey
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	<u>Chuck Corr</u>	Retired
Executive Director	Don Onwiler	NCWM
Public Sector Member	Mahesh Albuquerque	Colorado
	Bill Striejewski	Nevada
Private Sector Members	Chris Guay	Retired

Transportation-for-Hire Systems Task Group

Office	Name	Affiliation
Chair	<u>Mark Lovisa</u>	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	<u>Miland Kofford</u>	Utah
NIST Technical Advisor	John McGuire	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 Vehrken	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
	Marty Netzel	ABF Freight
	Mitchell Tuss	XPOLogistics

WIM Vehicle Scale Task Group

Office	Name	Affiliation
Chair	<u>Jim Willis</u>	New York
Public Sector Members	Tory Brewer	West Virginia
	Jason Flint	New Jersey
	Paul Floyd	Louisiana
	Mike Harrington	Iowa
	Robert Huff	Delaware
	Chad Parker	North Carolina
	Kristin Walter	Arkansas
	Alison Wilkinson	Maryland
Private Sector Member	Kiel Klasing	Kistler Instrument Corporation

NTEP Grain Analyzer Sector

Office	Name	Affiliation
Chair	<u>Jimmy Williams</u>	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
	Kate Smetana	Colorado
	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

Organization Chart

NTEP Measuring Sector

Office	Name	Affiliation
Chair	<u>Brent Price</u>	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	<u>Jim Pettinato</u>	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	<u>Jessica Ferree</u>	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	<u>Andrei Moldoveanu</u>	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

Organization Chart

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
	Joe Rickey	Rice Lake Weighing Systems
	Tony Romeo	Datalogic
	Adrian Ruthe	Loadscan
	Raghavendra Tenkasi Shankar	Zebra Technologies
	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
Interim Meeting	October 5 th – 7 th , 2026			Galloway, New Jersey
Annual Meeting	April 26 th – 29 th , 2027			New Hampshire

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
Interim Meeting	TBD			TBD
Annual 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	Mike Brooks Arizona Department of Agriculture, Weights and Measures Service Division			602-920-4202 mbrooks@azda.gov	
Annual Meeting	September 20 th – 24 th , 2026			Portland, Oregon	

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	October 24 th – 28 th , 2026			Atlanta, Georgia		

Past Chairmen

Conference	Year	Location	Chairman	Affiliation
1 st	1905	Washington, D.C.	Dr. S.W. Stratton	National Bureau of Standards
2 nd	1906	Washington, D.C.	Dr. S.W. Stratton	National Bureau of Standards
3 rd	1907	Washington, D.C.	Dr. S.W. Stratton	National Bureau of Standards
4 th	1908	Washington, D.C.	Dr. S.W. Stratton	National Bureau of Standards
	1909	Conference Was Not Held		
5 th	1910	Washington, D.C.	Dr. S.W. Stratton	National Bureau of Standards
6 th	1911	Washington, D.C.	Dr. S.W. Stratton	National Bureau of Standards
7 th	1912	Washington, D.C.	Dr. S.W. Stratton	National Bureau of Standards
8 th	1913	Washington, D.C.	Dr. S.W. Stratton	National Bureau of Standards
9 th	1914	Washington, D.C.	Dr. S.W. Stratton	National Bureau of Standards
10 th	1915	Washington, D.C.	Dr. S.W. Stratton	National Bureau of Standards
11 th	1916	Washington, D.C.	Dr. S.W. Stratton	National Bureau of Standards
	1917	Conference Was Not Held		
	1918	Conference Was Not Held		
12 th	1919	Washington, D.C.	Dr. S.W. Stratton	National Bureau of Standards
13 th	1920	Washington, D.C.	Dr. S.W. Stratton	National Bureau of Standards
14 th	1921	Washington, D.C.	Dr. S.W. Stratton	National Bureau of Standards
15 th	1922	Washington, D.C.	Dr. S.W. Stratton	National Bureau of Standards
16 th	1923	Washington, D.C.	Dr. George Burgess	National Bureau of Standards
17 th	1924	Washington, D.C.	Dr. George Burgess	National Bureau of Standards
18 th	1925	Washington, D.C.	Dr. George Burgess	National Bureau of Standards
19 th	1926	Washington, D.C.	Dr. George Burgess	National Bureau of Standards
20 th	1927	Washington, D.C.	Dr. George Burgess	National Bureau of Standards
21 st	1928	Washington, D.C.	Dr. George Burgess	National Bureau of Standards
22 nd	1929	Washington, D.C.	Dr. George Burgess	National Bureau of Standards
23 rd	1930	Washington, D.C.	Dr. George Burgess	National Bureau of Standards
24 th	1931	Washington, D.C.	Dr. George Burgess	National Bureau of Standards
	1932	Conference Was Not Held		
	1933	Conference Was Not Held		
	1934	Conference Was Not Held		
25 th	1935	Washington, D.C.	Dr. Lyman Briggs	National Bureau of Standards
26 th	1936	Washington, D.C.	Dr. Lyman Briggs	National Bureau of Standards
27 th	1937	Washington, D.C.	Dr. Lyman Briggs	National Bureau of Standards
28 th	1938	Washington, D.C.	Dr. Lyman Briggs	National Bureau of Standards
29 th	1939	Washington, D.C.	Dr. Lyman Briggs	National Bureau of Standards
30 th	1940	Washington, D.C.	Dr. Lyman Briggs	National Bureau of Standards
31 st	1941	Washington, D.C.	Dr. Lyman Briggs	National Bureau of Standards
	1942	Conference Was Not Held		
	1943	Conference Was Not Held		
	1944	Conference Was Not Held		
	1945	Conference Was Not Held		
32 nd	1946	Washington, D.C.	Dr. E.U. Condon	National Bureau of Standards
33 rd	1947	Washington, D.C.	Dr. E.U. Condon	National Bureau of Standards
	1948	Conference Was Not Held		
34 th	1949	Washington, D.C.	Dr. E.U. Condon	National Bureau of Standards
35 th	1950	Washington, D.C.	Dr. E.U. Condon	National Bureau of Standards
36 th	1951	Washington, D.C.	Dr. E.U. Condon	National Bureau of Standards
37 th	1952	Washington, D.C.	Dr. A.V. Astin	National Bureau of Standards
38 th	1953	Washington, D.C.	Dr. A.V. Astin	National Bureau of Standards
39 th	1954	Washington, D.C.	Dr. A.V. Astin	National Bureau of Standards
40 th	1955	Washington, D.C.	Dr. A.V. Astin	National Bureau of Standards

Past Chairmen				
Conference	Year	Location	Chairman	Affiliation
41 st	1956	Washington, D.C.	Dr. A.V. Astin	National Bureau of Standards
42 nd	1957	Washington, D.C.	Dr. A.V. Astin	National Bureau of Standards
43 rd	1958	Washington, D.C.	J.P. McBride	Massachusetts
44 th	1959	Washington, D.C.	C.M. Fuller	California
45 th	1960	Washington, D.C.	H.E. Crawford	Florida
46 th	1961	Washington, D.C.	R.E. Meek	Indiana
47 th	1962	Washington, D.C.	Robert Williams	New York
48 th	1963	Washington, D.C.	C.H. Stender	South Carolina
49 th	1964	Washington, D.C.	D.M. Turnbull	Washington
50 th	1965	Washington, D.C.	V.D. Campbell	Ohio
51 st	1966	Denver, CO	J.F. True	Kansas
52 nd	1967	Washington, D.C.	J.E. Bowen	Massachusetts
53 rd	1968	Washington, D.C.	C.C. Morgan	Indiana
54 th	1969	Washington, D.C.	S.H. Christie	New Jersey
55 th	1970	Salt Lake City, UT	R.W. Searles	Ohio
56 th	1971	Washington, D.C.	M. Jennings	Tennessee
57 th	1972	Washington, D.C.	E.H. Black	California
58 th	1973	Minneapolis, MN	George Johnson	Kentucky
59 th	1974	Washington, D.C.	John Lewis	Washington
60 th	1975	San Diego, CA	Sydney Andrews	Florida
61 st	1976	Washington, D.C.	Richard Thompson	Maryland
62 nd	1977	Dallas, TX	Earl Prideaux	Colorado
63 rd	1978	Washington, D.C.	James Lyles	Virginia
64 th	1979	Portland, OR	Kendrick Simila	Oregon
65 th	1980	Washington, D.C.	Charles Vincent	Texas
66 th	1981	St. Louis, MO	Edward Stadolnik	Massachusetts
67 th	1982	Atlanta, GA	Edward Heffron	Michigan
68 th	1983	Sacramento, CA	Charles Greene	New Mexico
69 th	1984	Boston, MA	Sam Hindsman	Arkansas
70 th	1985	Washington, D.C.	Ezio Delfino	California
71 st	1986	Albuquerque, NM	George Mattimoe	Hawaii
72 nd	1987	Little Rock, AR	Frank Nagele	Michigan
73 rd	1988	Grand Rapids, MI	Darrell Guensler	California
74 th	1989	Seattle, WA	John Bartfai	New York
75 th	1990	Washington, D.C.	Fred Gerk	New Mexico
76 th	1991	Philadelphia, PA	N. David Smith	North Carolina
77 th	1992	Nashville, TN	Sidney Colbrook	Illinois
78 th	1993	Kansas City, MO	Allan Nelson	Connecticut
79 th	1994	San Diego, CA	Thomas Geiler	Massachusetts
80 th	1995	Portland, ME	James Truex	Ohio
81 st	1996	New Orleans, LA	Charles Gardner	New York
82 nd	1997	Chicago, IL	Barbara Bloch	California
83 rd	1998	Portland, OR	Steven Malone	Nebraska
84 th	1999	Burlington, VT	Aves Thompson	Alaska
85 th	2000	Richmond, VA	Wes Diggs	Virginia
86 th	2001	Washington, DC	Louis Straub	Maryland
87 th	2002	Cincinnati, OH	Ronald Murdock	North Carolina
88 th	2003	Sparks, NV	Ross Andersen	New York
89 th	2004	Pittsburgh, PA	Dennis Ehrhart	Arizona
90 th	2005	Orlando, FL	Wes Diggs	Virginia
91 st	2006	Chicago, IL	Don Onwiler	Nebraska

Past Chairmen				
Conference	Year	Location	Chairman	Affiliation
92 nd	2007	Salt Lake City, UT	Michael Cleary	California
93 rd	2008	Burlington, VT	Judy Cardin	Wisconsin
94 th	2009	San Antonio, TX	Jack Kane	Montana
95 th	2010	St. Paul, MN	Randy Jennings	Tennessee
96 th	2011	Missoula, MT	Tim Tyson	Kansas
97 th	2012	Portland, ME	Kurt Floren	California
98 th	2013	Louisville, KY	Stephen Benjamin	North Carolina
99 th	2014	Detroit, MI	John Gaccione	New York
100 th	2015	Philadelphia, PA	Ronald Hayes	Missouri
101 st	2016	Denver, CO	Jerry Buendel	Washington
102 nd	2017	Pittsburgh, PA	Kristin Macey	California
103 rd	2018	Tulsa, OK	James Cassidy	Massachusetts
104 th	2019	Milwaukee, WI	Brett Gurney	Utah
105 th	2020	Lansing, MI	Craig VanBuren	Michigan
106 th	2021	Rochester, NY	Hal Prince	Florida
107 th	2022	Tacoma, WA	Ivan Hankins	Iowa
108 th	2023	Norfolk, VA	Mahesh Albuquerque	Colorado
109 th	2024	Cleveland, OH	Gene Robertson	Mississippi
110 th	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 Annual Meeting, Committees will conduct Open Hearings during which all attendees can offer comments on items printed in the Committee Interim Agendas. Following Open Hearings, the Committees will convene in work sessions to prepare addendum sheets that modify their reports. Items given voting status by the Committees will be presented during the Voting Sessions on Wednesday and Thursday. Active members in attendance may vote on Committee recommendations to amend the national standards.

SUPPORTING DOCUMENTS

Additional letters, presentations and data may have been part of the committee's consideration. Please refer to www.ncwm.com/publication-16 to review these documents.

ITEMS GROUPED INTO BLOCKS

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

DESIGNATION OF ITEM STATUS

The Committee Interim Reports contain recommendations and information on items discussed during the 2026 NCWM Interim Meeting held January 11 - 14, 2026 at Mobile, Alabama. These reports form the basis for the conduct of the committee meetings. Each Committee will address items in its report during Open Hearings.

The status of each item contained in the Committee Interim Reports is designated as one of the following:

Voting Item: The item is designated with a "V" to indicate the Committee is making recommendations requiring a vote by the active members of NCWM. The recommended language to be voted on is in **bold face type**.

Informational Item: The item is designated with an "I" to indicate the item is under consideration by the Committee but not proposed for Voting.

Assigned Item: The item is designated with an "A" to indicate the item has merit; however, the item was assigned to a task group or subcommittee for further development, and the Committee will wait for a recommendation from that group before taking any further action on the item.

Developing Item: The item is designated with a "D" to indicate that it has merit; however, the item was returned to the submitter or other designated party for further development before any action can be taken at the national level.

Withdrawn Item: The item is designated with a "W" to indicate the item has been removed from consideration by the Committee.

Some Voting Items are considered individually; others may be grouped in a consent calendar. Consent calendar items are Voting Items that the committee has assembled as a single Voting Item during their deliberation after the Open Hearings on the assumption that the items are without opposition and will not require discussion. The Voting Items that have been grouped into consent calendar items will be listed on the addendum sheets, which are published during the week. Prior to adopting the consent calendar, the committee will entertain any requests from the floor to remove specific items from the consent calendar for individual discussion and voting.

Committees may change the status designation of agenda items (Developing, Informational, Voting, and Withdrawn) up until the report is adopted, except that items which are marked Developing, Informational or Withdrawn cannot be changed to Voting Status. Any change from the Committee Interim Report (as contained in this publication) or from what appears on the addendum sheets will be explained to the attendees prior to a motion and will be acted upon by the active members of NCWM prior to calling for the vote.

ADDENDUM SHEETS

Modifications to the Committee Interim Reports will be documented in addendum sheets prepared by the committees following the Open Hearings. The addendum sheets will be made available to attendees no later than 8:00 p.m. on Tuesday, July 28th, 2026, in the registration area. Committee Interim Reports may be further modified as a result of actions taken by the Committee or membership during the Voting Session on Wednesday, July 29th, 2026.

VOTING SYSTEM

All registered attendees may speak to the issues on the "floor", both business and technical items. However, the adoption of final reports of Committees on technical issues, as well as other technical issues, is to be decided by a formal vote of the active members in accordance with the following voting structures and procedures. Please see NCWM Bylaws at www.ncwm.com/policy-bylaws for a complete description of the voting system.

House of State Representatives:

This body comprises one active member from each state, officially designated as its representative and registered for the Annual Meeting. They will vote on:

- all business items relating to NCWM, Inc.
- technical questions before the Corporation, including reports and recommendations of all Standing Committees.
- technical items relating to weights and measures; technical handbooks; and legal metrology.

Members of this house are identified by a maroon name tag ribbon with the word "Representative."

House of Delegates:

This body comprises all other Active members registered for the Annual Meeting and those not "seated" in the House of State Representatives. They will vote on:

- all business items relating to NCWM, Inc.
- technical questions before the Corporation, including reports and recommendations of all Standing Committees.
- technical items relating to weights and measures; technical handbooks; and legal metrology.

Members of this house are identified by a blue name tag ribbon with the word "Delegate."

House of General Membership:

This body comprises associate and advisory members registered for the Annual Meeting. They shall vote on all business items relating to NCWM, Inc.

WRITTEN COMMENTS OR ORAL STATEMENTS

Any person or organization wishing to provide a formal presentation during a committee session should submit a written request to the Executive Director. Reasonable time limitations 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

PARTICIPATION

All sessions are open to registered meeting attendees. 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 if:

1. The NCWM Chairman or, in his 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 desk.

If possible, the posting will be made at least a day before 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 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 the Annual Meeting. Each committee will prepare its annual report, containing recommendations based on the presentations, discussions, and deliberations on all matters in its interim report that were addressed during the Annual Meeting. These reports will be published in the *Report of the 111th Annual Meeting of the National Council on Weights and Measures*, to be posted online at www.ncwm.com. Electronic copies of the *Report of the 111th Annual Meeting of the National Council on Weights and Measures* will be distributed to all members of NCWM. Other interested parties may request a copy of the publication from the Executive Director.

National Council on Weights and Measures
Attn: Don Onwiler, Executive Director
402-434-4880, don.onwiler@ncwm.com

INTERIM MEETING

The 2027 NCWM Interim Meeting will be held:

Redondo Beach, California / January 24th – 27th, 2027

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 only in inch-pound units.

NCWM Board of Directors 2026 Annual Meeting Agenda

Mr. Kevin Schnepf, NCWM Chairman
California

INTRODUCTION

This is the agenda of the Board of Directors (hereinafter referred to as the “Board”) for the 111th Annual Meeting of the National Council on Weights and Measures (NCWM). This report is based on the Interim Report offered in the NCWM Publication 16, testimony heard at public hearings, comments received from the regional weights and measures associations and other parties, the addendum sheets issued at the Annual Meeting, and actions taken by the membership at the voting session of the Annual Meeting. The Informational items presented below were adopted as presented when the Board’s report was approved.

Table A identifies the agenda and appendix items. Agenda items are identified in the Report by Reference Key Number, Item Title, and Page Number. Item numbers are those assigned in the Interim Meeting agenda. A Voting item is indicated with a “V” after the item number. An item marked with an “I” after the reference key number is an Informational item. An item marked with a “D” after the reference key number is a Developing item. The developing designation indicates an item has merit; however, the item was returned to the submitter for further development before any action can be taken at the national level. An agenda “Item Under Consideration” is a statement of proposal and not necessarily a recommendation of the BOD. Suggested revisions are shown in **bold** face print by **striking out** information to be deleted and underlining information to be added. Table B lists the results of any Voting Items.

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.

Some Voting Items are considered individually; others may be grouped in a consent calendar. Consent calendar items are Voting Items that the Board has assembled as a single Voting Item during their deliberation after the Open Hearings, assuming that the items are without opposition and will not require discussion. The Voting Items that have been grouped into consent calendar items will be listed on the addendum sheets. Prior to adoption of the consent calendar, the Board will remove specific items from the consent calendar upon request to be discussed and voted upon individually.

The Board may change the status designation of agenda items (Developing, Informational, Assigned, Voting and Withdrawn) up until the report is adopted, except those items which are marked Developing, Informational, Assigned or Withdrawn cannot be changed to Voting Status. Any change from the Board Interim Report (as contained in this publication) or from what appears on the addendum sheets will be explained to the attendees prior to a motion and will be acted upon by the active members of NCWM prior to calling for the vote.

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, presentation and data may have been submitted for consideration with this item. Please refer to <https://www.ncwm.com/publication-16> to review these documents.

All sessions are open to registered meeting attendees. 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) the Chairman or, in his 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 desk. If possible, the posting will be made at least a day before the planned closed session.

Subject Series List

Activity Reports.....	ACT Series
Strategic Planning, Policies, and Bylaws.....	SPB Series
Financial	FIN Series
Other Items	OTH Series

Table A
Table of Contents

Reference Key	Title of Item	BOD Page
ACT – ACTIVITY REPORTS		7
ACT-1 I	Membership	7
ACT-2 I	Meetings	8
ACT-3 I	Participation in International Standard-Setting	8
ACT-4 I	Associate Membership Committee Activity	8
ACT-5 I	Task Groups, Subcommittees, Steering Committees	9
ACT-6 I	Regional Association Activities.....	11
SPB – STRATEGIC PLANNING, POLICIES, AND BYLAWS		12
SPB-24.1 I	Electronic Publications 15 & 16	12
SPB-26.1		V
	 Article X – Voting System	
		13
FIN – FINANCIAL.....		16
FIN-26.1 I	Associate Membership Dues	16
FIN-1 I	Treasurer's Report.....	18
APPENDICES		
A	ACT-3: Report of the Activities of the International Organization of Legal Metrology (OIML) and Regional Legal Metrology Organizations.....	A21
B	ACT-4: Associate Membership Committee (AMC) Agenda and Draft Meeting Minutes	B25

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)

1 ACT – ACTIVITY REPORTS

2 ACT-1 I Membership

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

Year Type	March 2018	March 2019	March 2020	March 2021	March 2022	March 2023	March 2024	March 2025	March 2026
Associate	760	739	726	712	701	674	667	728	762
Foreign Associate	88	90	99	98	100	96	100	101	117
Total Associate	848	829	825	810	801	770	767	829	879
State Government	684	796	817	672	731	756	714	700	668
Local Government	468	458	456	427	406	396	395	390	375
Total Active	1152	1254	1273	1099	1137	1152	1109	1090	1043
NIST	15	16	17	16	16	19	13	14	14
Other Federal Government	11	10	8	7	8	7	9	13	11
Foreign Government	16	15	15	12	14	14	15	17	17
Retired	224	227	239	246	245	248	249	229	227
Total Advisory	266	268	279	281	283	288	286	273	269
Grand Total	2266	2351	2377	2190	2221	2210	2162	2192	2191

ACT-2 I Meetings

Interim Meetings:

- 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 23-27, 2028 113th Annual Meeting: Hyatt Regency St. Louis Arch, St. Louis, Missouri

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

The NIST Office of Weights and Measures will provide a report of its important efforts in international standard-setting at the NCWM Annual Meeting in July. See Appendix A for the previous report.

ACT-4 I Associate Membership Committee Activity

Approximately 40% of NCWM members are Associate members. The Associate Membership Committee (AMC) is organized under the Bylaws of the National Conference on Weights and Measures, Inc. Also, AMC operates by separate Bylaws, which are available on the Committee page of www.ncwm.com. AMC meets at least 2 times per year in conjunction with NCWM Interim and Annual Meetings, and they invite all to attend. The AMC consists of between 5 and 10 members who, amongst themselves, elect officers to serve as Chair, Vice-Chair, and Secretary/Treasurer. See Appendix B for information on current members and officers.

AMC has established a reputation for promoting and improving NCWM and has demonstrated its desire to improve understanding of weights and measures activities in the public and private sectors.

The NCWM membership dues for Associate members of \$115 are \$15 higher than that for Active or Advisory members. The extra \$15 is not for NCWM but rather is placed in a separate account referred to as the AMC Fund. The AMC has the discretion to allocate the funds in various ways. One means of allocating these funds is to provide grants in support of weights and measures training. The Committee receives applications and awards training grants from the AMC fund following their "Guidelines for Selection and Approval of Training Funds," which are posted on the Committee's webpage on www.ncwm.com. Downloadable applications for training grants and reimbursement forms are also available at this site.

The criteria for receiving AMC funds for training are as follows:

1. Funding request forms that are complete, specific, and detailed will receive priority attention for approval.

Based on the degree of missing or ambiguous information provided, individual requests may not be given any consideration during the AMC review process, pending further clarification.

2. Preference is given to training requests that benefit higher numbers of participants over those for fewer or single-person benefit. The Committee also gives priority consideration to multi-state training that encourages uniformity.

3. In general, attending meetings such as NCWM Annual Meetings, Interim Meetings, or regional associations meetings will not be considered training.

4. As a lower priority, the committee will consider requests for the purchase of training materials but not requests for the purchase of assets (such as projectors).

5. 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.

Neutral Comments:

Advisory:

- AMC Chairman Jim Pettinato provided a synopsis of the AMC meeting proceedings during the 2026 Interim BOD open hearings.
 - Since the last Annual Meeting two new requests for funding have been received/approved. At the AMC meeting, the financial report was reviewed; the balance in the training fund is currently healthy.
 - The AMC representatives on each of the standing committees provided an update of current activity of interest to AMC members. The AMC members in attendance expressed support for the Board's consideration of the AMC member dues increase.

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 to assist NCWM membership in decision-making on 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 its open hearings.

At the 2026 Interim Meeting, the board received updates from the following groups that report to the board:

- Mahesh Albuquerque reported that the EVSE Training Planning Committee is progressing well in preparation for the training to take place in Garden Grove, CA in February 2026.
- Kevin Schnepf provided an update on the EVSE Task Group.
- Jason Flint reported that the Standards Development Task Group has completed a review of Concept 1 of the 2018 Carter Team Report, and has begun a review of Concept 2 to determine the viability of voting twice per year.
- Additionally, Steve Benjamin, chair of the former Promotional Toolkit Task Group, offered to work with some state metrologists to develop a video promoting metrology laboratories' work. Some Associate Membership Committee funds remain earmarked for the video productions, and the NCWM will continue to provide matching funds in that effort.

Current task groups and subcommittees are listed here.

BOD 2026 Annual Meeting Agenda

Reporting to the Board of Directors:

Policy and Bylaw Review Task Group

Chair: Chuck Corr

563-357-4167, chuckcorrconsulting@gmail.com

Training Planning Task Group

Chair: Mahesh Albuquerque

303-318-8502, mahesh.albuquerque@state.co.us

EVSE Task Group

Chair: Scott Dolan

802-828-2436, scott.dolan@vermont.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: 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

LPG Electronic Temperature Compensation Task Group

Chair: Christopher Wagner

610-308-3822, cwagner@npga.org

LMD Density Correction Task Group

Chair: To Be Determined

Reporting to the Specifications and Tolerances Committee:

Cannabis Task Group:

Chair: Evan Foisy

631-560-3497, EFoisy@andonline.com

Milk Meter Tolerance Task Group

Chair: 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

WIM Vehicle Scale Task Group

Chair: Jim Willis
518-485-8377, james.willis@agriculture.ny.gov

LMD Density Correction Task Group

Chair: To Be Determined

Reporting to the Professional Development Committee:

Safety Subcommittee

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

Women in Weights and Measures Subcommittee

Co-Chair: Cheryl Ayer
303-318-8502, cheryl.e.ayer@agr.nh.gov

Co-Chair: Brandi Harder
715-234-9171, bharder@ricelake.com

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: Steve Timar, steve.timar@agriculture.ny.gov

NEWMA Interim Meeting

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

CWMA Annual Meeting

April 20-23, 2026
Wichita, Kansas

BOD 2026 Annual Meeting Agenda

Contact: Sherry Turvey, Sherry.Turvey@ks.gov

CWMA Interim Meeting

To Be Determined

Contact: Sherry Turvey, Sherry.Turvey@ks.gov

WWMA Annual Meeting

Portland, Oregon

September 20-24, 2026

Contact: Miland Kofford, mkofford@utah.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:

2024: Informational

2025: Informational

2026: Informational

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 V 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

...

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).

...

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.~~

...

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:

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: No Comments

Regulatory:

•

Industry:

•

Advisory:

•

Comments Against: No Comments

BOD 2026 Annual Meeting Agenda

Regulatory:

-

Industry:

-

Advisory:

-

Neutral Comments: No 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 I 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: No Comments

Regulatory:

-

Industry:

-

Advisory:

-

Comments Against: No Comments

Regulatory:

-

Industry:

-

Advisory:

-

Neutral Comments: No Comments

Regulatory:

-

Industry:

-

Advisory:

-

Item Development:

Hearing no comments, the board has approved the new dues levels for the 2026-2027 fiscal year.

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

NCWM's financial health is strong and there are no concerns. NCWM has successfully funded the startup of its NTEP laboratory without incurring debt, and has begun operating it effectively. All financial transactions and balances have been properly recorded and reported, and our internal controls, including the FY 25 annual audit by Dana F. Cole & Company completed on December 5, 2025, 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	March 31, 2025	March 30, 2026
Current Assets	\$	\$
Checking/Savings		
Associate Member Fund	32,908.80	30,684.66
Certificates of Deposit	266,690.70	306,640.34
Equities	961,424.55	1,163,394.69
Money Market Fund	131,120.81	399,180.16
Checking	27,767.05	35,804.87
Savings	17.46	35,370.40
Total Checking/Savings	<u>1,419,929.37</u>	<u>1,971,075.12</u>
Accounts Receivable	38,511.74	19,392.66
Other Current Assets	565,234.71	394,547.73
Fixed Assets	12,190.32	-83,457.23
Other Assets	456,936.08	448,435.33
TOTAL ASSETS	<u>2,492,802.22</u>	<u>2,749,993.61</u>
LIABILITIES & EQUITY		
Liabilities		
Current Liabilities	<u>446,966.08</u>	<u>333,208.00</u>
Total Liabilities	446,966.08	333,208.00
Equity		
Designated - Associate Membership	55,203.91	30,395.96
Unrestricted Net Assets	1,792,088.60	1,911,279.78
Net Income	<u>198,543.63</u>	<u>475,109.87</u>
Total Equity	<u>2,045,836.14</u>	<u>2,416,785.61</u>
TOTAL LIABILITIES & EQUITY	<u>2,492,802.22</u>	<u>2,749,993.61</u>

-
- 1 Kevin Schnepf, California | NCWM Chairman
 - 2 Jason Flint, New Jersey | NCWM Chairman-Elect
 - 3 Marc Paquette, Vermont | NTEP Committee Chair
 - 4 Mahesh Albuquerque, Colorado | Treasurer
 - 5 Daniel Walker, Ohio | Active Membership - Central
 - 6 James Willis, New York | Active Membership – Northeastern
 - 7 Paul Floyd, Louisiana | Active Membership - Southern
 - 8 Bill Striejewski, Nevada | Active Membership - Western
 - 9 Matt Curran, Florida | At-Large
 - 10 Jason Glass, Kentucky | At-Large
 - 11 Ray Johnson, Fairbanks Scales | AMC Representative
 - 12
 - 13 Don Onwiler, NCWM | Executive Director
 - 14 Katrice Lippa, NIST, OWM | Executive Secretary
 - 15 Erica Garnier, Measurement Canada | Advisor
 - 16 Jeff Gibson, NCWM | NTEP Administrator
 - 17 **Board of Directors**

Appendix A

July 2025 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)



International Standards Activities Update

David Sefcik
Leader, National Legal Metrology Program
Office of Weights and Measures (OWM)

NIST NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY
U.S. DEPARTMENT OF COMMERCE

NCWM 110th Annual Meeting
15 July 2025



International Legal Metrology Program **NIST**

 Chuck Ehrlich Served as U.S. International Committee of Legal Metrology (CIML) Member, on the OIML Presidential Council and as ILM Program Leader. Chuck recently retired from NIST after 38 years of service in national and international standards.	 Ralph Richter Served in OIML committees as an expert in gas and liquid flow measurement systems, including fuels. Ralph recently retired from NIST after 40 years of federal service, including a decade with the U.S. Navy.
 Katya Delak New Program Leader Expertise is in electrical metering, and digitalization, with a focus on supply chain	 Michael Nelson Research Chemist/Physical Scientist Expertise in chemical analyzers, electric vehicle supply equipment, and medical instruments
 Jan Konijnenburg General Engineer Expertise in weighing instruments, digitalization, and software security	 OIML ANSI American National Standards Institute ISO IEC

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”

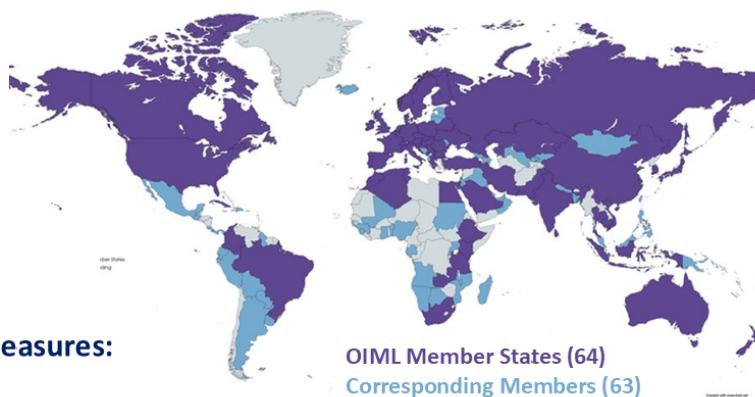
- DC applications are growing (solar panels, DC EVSE, battery units in grid storage)
- Project initiated and led by the U.S. (NIST OWM)

Promoting U.S. Manufacturers in International Markets



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:

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General/Technical Inquiries: owm@nist.gov

Appendix B Associate Membership Committee (AMC) Agenda and Draft Meeting Minutes



Associate Membership Committee Minutes Tuesday, January 13th, 2026 NCWM 2026 Interim Meeting – Mobile, AL

Call to Order: Chair Jim Pettinato called the meeting to order at approximately 7:10 AM.

Roll Call/Introductions: There were 10 Associate members in attendance.

- Jim Pettinato [Chair]
- Brent Price [Vice-chair and L&R Representative]
- Reid Wagner [Secretary/Treasurer]
- Ray Johnson [BOD Representative]
- Perry Lawton [PDC Representative]
- Dale Delarber
- Chuck Corr
- Richard Suiter
- Steve Trueman
- Ron Gibson

Vice-chair Brent Price provided an overview of the committee's charter for new potential participants.

Secretary/Treasurer Reid Wagner agreed to record the minutes for the meeting.

Approval of Agenda: The committee reviewed and approved the meeting agenda. Copies of the agenda were made available to attendees.

Approval of Previous Meeting Minutes: The committee reviewed and approved the previous meeting minutes from the July 2025 meeting. A copy of the minutes was also made available to attendees.

Financial Report: The committee reviewed the current financial report. In summary, the account balance as of 12/30/2025 was \$29,522.31. Payments pending in the amount of \$12,123.12 were included in the committee financial report; however, Ray Johnson reported in the Board of Directors update that the Toolkit Task Group has been idle, and that the "Toolkit Task Group" line item should be struck from payment pending section, and a new request will need to be submitted if the task group desires funds.

The committee noted that after this adjustment, the resulting pending payments amount should reflect \$11,500.00 and that the reported net balance of \$17,399.19 in available funds on the financial statement should be adjusted to \$18,022.31.

Secretary/Treasurer Reid Wagner provided an overview of the received requests for training funds from New Mexico and New York State. Jim Pettinato reviewed the voting records for the approvals of these trainings. There are also approved funds for training in Connecticut that to date have not been requested.

NCWM Standing Committee Reports:

Board of Directors (BOD): Ray Johnson delivered the BOD report.

- The Toolkit Task Group has been idle, so it should be struck from the current financial report.
 - See applicable adjustments under the Financial Report section of these minutes for the adjusted available funds.
- The Scale Manufacturer's Association (SMA) had their Fall board meeting in Lincoln, NE. SMA members were able to visit the NCWM offices and NTEP lab.

Laws & Regulations (L&R): Brent Price updated members on current discussions and topics of interest within the L&R Committee.

Professional Development Committee (PDC): Perry Lawton updated members on current topics and upcoming events of interest within the PDC.

- EVSE training in February 2026.
 - There are still sponsorship opportunities for AMC members available. Contact Perry Lawton or Mahesh Albuquerque for more information.

Old Business: The committee reviewed the planned increase in AMC member dues, which are slated to go up from \$115 to \$140 and take effect beginning in the Fall of 2026. There were no objections heard.

New Business: No new business.

Next Meeting: The next meeting of the AMC committee will be held in Philadelphia, PA during the 2026 NCWM Annual Meeting in July.

Meeting Adjournment: The meeting was adjourned at ~8:15 AM.

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

Mauricio Mejia, Committee Chair
Florida

INTRODUCTION

This is the agenda of the Laws and Regulations Committee (hereinafter referred to as the “Committee”) for the 111th Annual Meeting of the National Council on Weights and Measures (NCWM). This report is based on the Interim Report offered in the NCWM Publication 16, testimony heard at public hearings, comments received from the regional weights and measures associations and other parties, the addendum sheets issued at the Annual Meeting, and actions taken by the membership at the voting session of the Annual Meeting. The Informational items presented below were adopted as presented when the Board’s report was approved.

Table A identifies the agenda and appendix items. Agenda items are identified in the Report by Reference Key Number, Item Title, and Page Number. Item numbers are those assigned in the Interim Meeting agenda. A Voting item is indicated with a “V” after the item number. An item marked with an “I” after the reference key number is an Informational item. An item marked with a “D” after the reference key number is a Developing item. The developing designation indicates an item has merit; however, the item was returned to the submitter for further development before any action can be taken at the national level. An agenda “Item Under Consideration” is a statement of proposal and not necessarily a recommendation of the BOD. Suggested revisions are shown in **bold face print** by **striking out** information to be deleted and underlining information to be added. Table B lists the results of any Voting Items.

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.

Some Voting Items are considered individually; others may be grouped in a consent calendar. Consent calendar items are Voting Items that the Board has assembled as a single Voting Item during their deliberation after the Open Hearings, assuming that the items are without opposition and will not require discussion. The Voting Items that have been grouped into consent calendar items will be listed on the addendum sheets. Prior to adoption of the consent calendar, the Board will remove specific items from the consent calendar upon request to be discussed and voted upon individually.

The Board may change the status designation of agenda items (Developing, Informational, Assigned, Voting and Withdrawn) up until the report is adopted, except those items which are marked Developing, Informational, Assigned or Withdrawn cannot be changed to Voting Status. Any change from the Board Interim Report (as contained in this publication) or from what appears on the addendum sheets will be explained to the attendees prior to a motion and will be acted upon by the active members of NCWM prior to calling for the vote.

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, presentation and data may have been submitted for consideration with this item. Please refer to <https://www.ncwm.com/publication-16> to review these documents.

All sessions are open to registered meeting attendees. 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) the Chairman or, in his 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 desk. If possible, the posting will be made at least a day before the planned closed session.

Subject Series List

Handbook 130 – General	GEN Series
Uniform Laws	
Uniform Weights and Measures Law	WAM Series
Uniform Weighmaster Law.....	WML Series
Uniform Fuels and Automotive Lubricants Inspection Law	FLL Series
Uniform Regulations	
Uniform Packaging and Labeling Regulation	PAL Series
Uniform Regulation for the Method of Sale of Commodities	MOS Series
Uniform Unit Pricing Regulation	UPR Series
Uniform Regulation for the Voluntary Registration of Servicepersons and Service Agencies for Commercial Weighing and Measuring Devices	RSA Series
Uniform Open Dating Regulation	ODR Series
Uniform Regulation for National Type Evaluation.....	NTP Series
Uniform Fuels and Automotive Lubricants Regulation	FLR Series
Uniform E-commerce Regulation	ECM Series
Examination Procedure for Price Verification.....	PPV Series
NCWM Policy, Interpretations, and Guidelines.....	POL Series
Handbook 133	NET Series
Other Items	OTH Series

Table A
Table of Contents

Reference Key	Title of Item	L&R Page
PAL – UNIFORM PACKAGING AND LABELING REGULATION		31
PAL-26.1 W	6.3. Net Quantity.....	31
MOS – UNIFORM REGULATION FOR THE METHOD OF SALE OF COMMODITIES		36
MOS-24.2 V	2.16.3.1. Tare Weights, Part (c) Allowable difference.	36
MOS-26.2 A	2.21.2. Metered Sales by Liquid Volume.	43
MOS-26.3 A	Section 2.20 Gasoline and Gasoline Oxygenate Blends	47
UPR – UNIFORM UNIT PRICING REGULATION		53
UPR-26.1 V	Uniform Unit Pricing Regulation: Multiple Sections	53
FLR – UNIFORM FUELS AND AUTOMOTIVE LUBRICANTS REGULATION		60
FLR-26.1 A	7.2. Reproducibility Limits.....	60
ECM – UNIFORM E-COMMERCE REGULATION.....		65
ECM-26.1 V	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.....	65
OTH – OTHER ITEMS		70
OTH-24.1 A	X. Uniform Shipment Law	70
OTH-07.1 D	Fuels and Lubricants Subcommittee	77
OTH-11.1 D	Packaging and Labeling Subcommittee.....	79
NET – HANDBOOK 133		80
NET-26.1 W	Table 2-3. Moisture Allowances.....	80
ITEM BLOCK 4 (B4) MOISTURE ALLOWANCE CONSIDERATION		84
B4: POL-25.1 A	2.6.12. Point-of-Pack Inspection Guidelines.	85
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.....	86
APPENDICES		
A	OTH-11.1 Quantity-Related Expressions on a Principal Display Panel.....	A97

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 W 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.

1 2. **Production and expiration dates.**

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

4 4. **Contact information for the manufacturer or responsible entity.**

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

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

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

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

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

20 **Previous Status:**

21 New Proposal

22 **Original Justification:**

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

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

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

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

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

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

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

- 1 Concern: Adding dynamic QR codes complicates labeling, potentially confusing consumers or cluttering packaging.
- 2 Rebuttal: Since many food and beverage products already feature voluntary QR codes, switching to dynamic ones is a
3 minor adjustment that integrates seamlessly, enhancing safety with clear instructions.
- 4 Concern: Small manufacturers lack expertise to implement dynamic QR code systems.
- 5 Rebuttal: Voluntary QR codes are already widely used; transitioning to dynamic codes is straightforward with user-
6 friendly platforms and NCWM support, boosting consumer safety.
- 7 Concern: QR code scanning may fail in areas with poor internet, hindering safety information access.
- 8 Rebuttal: Many food and beverage products use voluntary QR codes effectively; dynamic codes can include offline-
9 readable data, and infrastructure improvements ensure broader safety benefits.
- 10 Concern: Mandating QR codes may reduce reliance on traditional safety communication methods.
- 11 Rebuttal: Voluntary QR codes already complement labels; dynamic QR codes enhance this system, providing batch-
12 specific safety data without replacing existing disclosures/
- 13 Concern: Maintaining dynamic QR code databases is resource-intensive for manufacturers and regulators.
- 14 Rebuttal: Many food and beverage products already manage voluntary QR code databases; dynamic systems use
15 scalable cloud solutions, simplifying the shift for enhanced recall safety.
- 16 Concern: Consumers may distrust QR codes due to privacy concerns, reducing adoption.
- 17 Rebuttal: Voluntary QR codes are widely accepted; dynamic codes with transparent, anonymized data policies build
18 trust, improving safety through better recall access.
- 19 Concern: Small retailers may struggle to verify dynamic QR code compliance, increasing burden.
- 20 Rebuttal: With voluntary QR codes already in use, dynamic codes are a simple upgrade, and NCWM guidelines can
21 streamline retailer verification for safety compliance.
- 22 Concern: Dynamic QR codes could be counterfeited, leading to fraudulent recalls or misinformation.
- 23 Rebuttal: Voluntary QR codes already exist securely; dynamic codes with cryptographic signatures ensure authenticity,
24 enhancing consumer safety and recall precision.
- 25 Concern: Industry may resist QR code mandates, prioritizing cost over safety.
- 26 Rebuttal: Many food and beverage products already use voluntary QR codes, so dynamic codes are a low-cost shift that
27 reduces recall costs and boosts consumer safety, aligning with industry goals.
- 28 Concern: QR code mandates may delay product launches due to compliance timelines.
- 29 Rebuttal: Voluntary QR codes are common; transitioning to dynamic codes by January 1, 2027, is a simple change that
30 aligns with existing processes, prioritizing safety.
- 31 Concern: Not all consumers will scan QR codes, limiting safety benefits.
- 32 Rebuttal: Voluntary QR codes are already scanned by many; dynamic codes enhance safety for those who use them,
33 complementing traditional labels for broader impact. Batch number can be looked up on mfg 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:

Weights and Measures Officials:

- None

Industry:

- None

Advisory:

- None

Comments Against:

Weights and Measures Officials:

- Multiple weights and measures officials opposed this item stating it is not a weights and measures issue, that the item addresses food safety and public health concerns and falls under federal regulations instead, others pointed fraud concerns using QR codes and questioned the fact that duplicate information is requested. In addition, it questioned the inclusion of this item in section 6.3 Net Quantity. All of them recommended Withdraw.

Industry:

- None

Advisory:

- The NIST OWM representative recommended Withdraw.

Neutral Comments:

Weights and Measures Officials:

- None

Industry:

- None

Advisory:

- None

Item Development:

New Proposal 2026

NCWM Interim 2026: Several weights and measures officials voiced concern that this item was not a weights and measures issue and recommended withdraw. Based on those comments and those from NIST OWM, the Committee concurred and withdrew the item.

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 V 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).**~~

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

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

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

(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:

1. 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

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

(2) 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 manufactured on or after December 28, 2022 shall be within:

i. for tare weights of 11 kg (25lb) or less cylinders :

1. a lower tolerance of (-) 3% and,

2. an upper tolerance of (+) 1%; or

ii. for tare weight of more than 11 kg (25lb) cylinders:

1. a lower tolerance of (-) 2% and,

2. an upper tolerance of (+) 1%

As prescribed by general requirement for specification cylinders, 49 C.F.R § 178.35

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.

3.13.2 Test Procedures

a. Test Procedure for Cylinders Labeled by Weight

1. Follow Section 2.3.1. “Define the Inspection Lot.” Use a “Category A” sampling plan in the inspection; select a random sample.
2. The cylinder should be marked or stenciled with a tare weight. The marked value may or may not be used by the filling plant when determining the net weight of those cylinders sold or filled by weight. If there is a tare weight marked on the net contents tag or directly on the cylinder, then an actual tare weight was determined at the time of fill. If there is no tare weight marked on a tag or on the cylinder, then the stamped or stenciled tare weight is presumed to have been used to determine the net contents.

Note: Check the accuracy of the stamped tare weights on empty cylinders whenever possible. ~~The actual tare weight must be within (a) 1/2 % of the stamped tare weight for 9.07 kg (20 lb) tare weights or less or (b) 1/4 % of the stamped tare weight for greater than 9.07 kg (20 lb) tare weights. (see NIST Handbook 130, Method of Sale Regulation, Section 2.16. “Compressed or Liquefied Gases in Refillable Cylinders.” establishes the allowable tolerance for cylinders based on the date of manufacture.~~

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 manufactured prior to December 28, 2022, shall be within:

i. 1/2 % for tare weights of 9 kg (20 lb) or less cylinders ; or

ii. 1/4 % for tare weights of more than 9 kg (20 lb) cylinders.

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 manufactured on or after December 28, 2022, shall be within:

i. for tare weights of 11 kg (25 lb) or less cylinders s:

1. a lower tolerance of (-) 3 % and,

2. an upper tolerance of (+) 1 %; or

ii. for tares weight of more than 11 kg (25 lb) cylinders:

1. a lower tolerance of (-) 2 % and,

2. an upper tolerance of (+) 1 %.

As described by general requirement for specification cylinders, 49 C.F.R. § 178.35

The cap is not included in the tare weight.

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 Transport 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.

- 1 • The following statement from the report is very telling: *“It is highly unusual and irregular to see a*
2 *tolerance where a very significant majority of the packages are in compliance (in this case, 98.4%).”* The
3 report goes on to state that 34.3% of “used” cylinders would not be in compliance with the DOT
4 tolerances. These two statements call attention to the fact that these grill cylinders are in constant
5 circulation, subject to a wide variety of conditions, treatment and possible abuse by potentially many
6 different customers, thereby underlining the need to steer clear of overburdensome and unwarranted
7 regulation.
- 8 • Scales utilized in most retail locations where cylinders are filled are beam scales which do not have the
9 capability of weighing cylinders to the sensitivity or number of decimal places necessary to verify the
10 initial tare weight while a cylinder is under vacuum using Handbook 130 requirements. Additionally,
11 there is no requirement in any national code or standard to fill cylinders by weight at the point of sale
12 when the cylinder is transported for non-commercial use. These cylinders are not considered to be
13 transported “in commerce” and are therefore not required to be filled by weight, thereby allowing for the
14 determination of maximum fill level using the fixed maximum liquid level gauge. Scales are not required
15 to be installed at these facilities.
- 16 • Even when the product is released to the atmosphere to “empty” the cylinder, there will always be some
17 amount of liquid and vapor remaining in the cylinder, unless the cylinder has been put under vacuum. The
18 liquid, of course, is much denser than air and the vapor in the cylinder is 1.5 times the weight of the air
19 that was in the sample cylinders when they were weighed to establish the “average” tare weights.
- 20 • A minus tolerance of -3% will not result in extreme loss to the propane marketer in most cases, because
21 the overfilling prevention device (OPD) will activate and prevent the overfilling of the cylinder in the vast
22 majority of cases. As stated in the report, only 1.1% of all cylinders tested exceeded the legal filling limit.
23 Considering the time of year that this project was undertaken and in some northern states, it is very likely
24 that some of those cylinders may have been filled volumetrically when the temperature was below 40 °F,
25 it would not be unusual that more product was put into the cylinder because the OPD is calibrated to the
26 maximum fill at 40 °F and the liquid density increases as the temperature gets colder.
- 27 • The price for a pound of propane as stated in the report seems high, as it would equate to \$5.51 per gallon
28 (4.24 lbs. per gallon). The Department of Energy published the average cost of propane in 2022 and it
29 was shown to be \$2.23 per gallon.

30 Opposing arguments may take the following form:

- 31 • “The purpose of Handbook 130 is to ensure that the customer gets what he pays for and that the propane
32 marketer doesn’t lose out, either.” The rebuttal to this argument from the standpoint of the customer is
33 provided in the justification in number 18 above. From the marketer’s standpoint, the fact that the vast
34 majority of retail gallons sold in the U.S. are sold by NPGA members and that those very members
35 endorsed this proposal is evidence that marketers are not concerned about the small quantities of gas that
36 may not be billed to the customer.
- 37 • “We should make DOT change their tolerances instead of NCWM changing theirs.” The fact is that
38 NCWM allowable differences are so unreasonable that 56% of newly manufactured cylinders were not in
39 compliance with them. That should be reason enough to realize that NCWM needs to change. In addition,
40 once gas is put into a cylinder, there will always be a little bit of liquid remaining in the cylinder unless it
41 is vacuum purged or opened to the atmosphere. This means that accurately measuring the tare weight of
42 a cylinder becomes very difficult unless specific procedures are followed to ensure that the cylinder is
43 truly “empty.”
44

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

Comments in Favor:

Weights and Measures Officials:

- Several weights and measures officials supported amending the Item as proposed by NIST OWM and moving it forward as a Voting item.

Industry:

- The representative for the National Propane Gas Association recommended that the Committee adopt the language changes provided by NIST OWM and move the item forward as a Voting item.

Advisory:

- None

Comments Against:

Weights and Measures Officials:

- A weights and measures official representing California opposed this item and recommended Withdraw.

Industry:

- None

Advisory:

- The NIST OWM representative shared that the Federal DOT code changes on tare weight allowable differences have been implemented and they supersede the NIST Handbook regulation . He stated that we need to move to avoid Federal preemption. The NIST OWM representative provided suggested language changes and requested them to be reflected in HB 130 and HB 133 to align the requirements in both publications.

- None

Neutral Comments:

Weights and Measures Officials:

- None.

Industry:

- None

Advisory:

- None

Item Development:

NCWM 2026 Interim: The Committee accepted the proposed changes by NIST OWM including adding the new language to NIST Handbook 133 to harmonize the requirements in both Handbooks. The item now shows Section 3.13.2 of HB 133, incorporating a reference to the allowable tare differences in HB 130. Additionally, the Committee added the words “cylinders” to that language to better denote the allowable tare differences of each specific cylinder size, per example, instead of reading “for tare weight of 11 kg (25 lb.) or less” it reads “for tare weights of 11 kg (25 lb.) or less cylinders ”. With these changes the item is moving forward as Voting.

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.

1 CWMA 2025 Interim Meeting:

2 No comments.

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

4 NEWMA 2025 Interim Meeting:

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

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

9 SWMA 2025 Annual Meeting:

10 Mr. Chris Wagner with NPGA provided the following comments:

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

18 **49 CFR § 107.202 Standards for determining preemption.**

19 (a) Except as provided in § 107.221 and unless otherwise authorized by Federal law, any requirement of a State or
20 political subdivision thereof or an Indian tribe that concerns one of the following subjects and that is not substantively
21 the same as any provision of the Federal hazardous materials transportation law, a regulation issued under the Federal
22 hazardous material transportation law, or a hazardous material transportation security regulation or directive issued by
23 the Secretary of Homeland Security that concerns that subject, is preempted:

24 (1) The designation, description, and classification of hazardous material.

25 (2) The packing, repacking, handling, labeling, marking, and placarding of hazardous material.

26 (3) The preparation, execution, and use of shipping documents pertaining to hazardous material and requirements
27 related to the number, content, and placement of those documents.

28 (4) The written notification, recording, and reporting of the unintentional release in transportation of hazardous material
29 and other written hazardous materials transportation incident reporting involving State or local emergency responders
30 in the initial response to the incident.

31 (5) The design, manufacturing, fabrication, marking, maintenance, reconditioning, repairing, or testing of a packaging
32 or a container which is represented, marked, certified, or sold as qualified for use in the transportation of hazardous
33 material.

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

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

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

MOS-26.2 A 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 an 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:

Weights and Measures Officials:

- None

Industry:

- None

Advisory:

- None

Comments Against:

Weights and Measures Officials:

- None

Industry:

- None

Advisory:

- None

Neutral Comments:

Weights and Measures Officials:

- The Committee heard from multiple weights and measures officials who recommended the item to be Developing or Assigned to a Work Group. They expressed concerns regarding the additional burden placed on the industry, the availability of these devices as well as their suitability and accuracy under normal testing conditions. Most of them concurred on the need for a study to obtain sound data supporting an electronic temperature compensation requirement.

Industry:

- Representatives from the National Propane Gas Association and Meter Manufacturers Association recommended the item be assigned to a Work Group.

Advisory:

- The representative of NIST OWM supported the item to be Developing or assign it to a Work Group.

Item Development:

New Proposal 2026

NCWM 2026 Interim: Taking into consideration the concerns of those that provided comments and the request of the submitter, the Committee decided to recommend that this item be assigned to a Work Group and keep open the effective dates proposed in it. The work group will coordinate and oversee, in conjunction with the industry, the design and execution of a study to determine the effectiveness and cost-efficient viability of electronic temperature compensators in all applications before they become a requirement. Depending on the results of the study, if established the item has merit, the Work Group will recommend final language, any required alignment of it with other publications, and effective dates.

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

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.

CWMA 2025 Interim Meeting:

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 A 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)
- 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.

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

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:

Weights and Measures Officials:

- None

Industry:

- The Submitter representing the American Petroleum Institute gave a presentation and explained that the purpose of the item is to show adjustments made to correct inaccuracy in volume when blending ethanol and gasoline and that he believes the item is fully developed. He recommended putting the item forward as Voting and others from industry agreed with the submitter and recommended a voting status.

Advisory:

- None

Comments Against:

Weights and Measures Officials:

- A weights and measures official from Illinois presented a handout opposing this item which is available on the NCWM site under supporting documents.

Industry:

- None

Advisory:

The Chair of FALS shared that there was both support and opposition to this item in the FALS meeting. For this reason, FALS took no position.

Neutral Comments:

Weights and Measures Officials:

- Numerous weights and measures officials spoke on the proposed item and agree this should have an Assigned or Developing status.

Industry:

- The submitter after hearing comments from the floor agreed that this item should align between L&R and S&T.

Advisory:

- The representative of NIST OWM stated that there should be harmonization between MOS and FLR and need to move the items before S&T and L&R together. They recommended assigning this item and the S&T item to a Work Group.

Item Development:

New Proposal 2026

NCWM 2026 Interim: The Committee received comments in favor of this item from several industry representatives; they expressed the item was fully developed and recommended voting status. On the other hand, no weights and measures officials supported the item as written. A representative from Illinois recommended withdrawn, some others recommended further development, and many recommended it to be assigned to a Work Group for further review and development. weights and measures officials, Advisors from NIST OWM, FALS, and even the submitter concurred the proposed language in this item shall also be included in FLR 3.2.5. In addition, several weights and measures officials and NIST Advisors recommended this item to move forward contingent to Item LMD-26.1 from the L&R agenda moving forward as voting.

The Committee recommends this item be assigned to a Work Group for further vetting and developing. The Task Group will be charged with determining if the item is needed or not, and if yes, developing the final language and including it in FLR 3.2.5 to align both sections. In addition, the group will recommend if the items shall move forward as voting contingent to one another or not.

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 Schnepf (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 oversight 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 V 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 (UUPR) (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 1211.(c) and (d), and the mandate of Section ~~46~~15. of this Law, as well as the trend in unit pricing, both voluntary and mandatory, the UUPR 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 UUPR 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 UUPR 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 UUPR 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 UUPR 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 UUPR, 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 UUPR. 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.~~

For a table detailing which states have adopted the Uniform Unit Pricing Regulation refer to NIST Handbook 130 Section II. Uniformity of Laws and Regulations, Subsection C. Summary of State Laws and Regulations in Weights and Measures

Table of Contents

C. UNIFORM UNIT PRICING REGULATION..... ERROR! BOOKMARK NOT DEFINED.
1. BACKGROUND ERROR! BOOKMARK NOT DEFINED.
2. STATUS OF PROMULGATION ERROR! BOOKMARK NOT DEFINED.

Section 1. Application 55
Section 2. **Definitions**.....55
Section 23. Terms for Unit Pricing.....56
Section 34. Exemptions 57
Section 45. Pricing.....57
Section 56. Presentation of Price **Error! Bookmark not defined.**
Section 67. Uniformity 58
Section 78. Effective Date 58

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 23. 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 ~~34~~. 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 ~~34~~ NOTE] shall be exempt from these provisions.

Section ~~34~~. NOTE: See “Uniform Packaging and Labeling Regulation.”

(Amended 202X)

Section 45. 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 56. Presentation of Price

(a) In any retail **or e-commerce** establishment ~~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 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 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) Where a sign providing unit price information for one or more sizes or brands of a given commodity is used, that sign shall be displayed clearly and in a non-deceptive manner in a central location as close as practical to all items to which the sign refers.

(c) If a single sign or tag includes the unit price information for more than one brand or size of a given commodity, the following information shall be provided:

(1) the identity and the brand name of the commodity;

(2) the quantity of the packaged commodity, if more than one package size per brand is displayed;

(3) the total retail sales price; and

(4) the price per appropriate unit, in accordance with Section ~~23~~. Terms for Unit Pricing.

(d) The unit price shall be displayed for all advertised item price offers.

(e) The words “Unit Price” must be directly adjacent to unit price.

(f) The term “per” shall precede the unit (e.g., \$0.23 per oz)

(g) The height of the text providing the unit price should be as large as feasible, but shall be no less than 0.24 inches (6 mm).

(h) Electronic Shelf Labels (ESLs). ESLs must comply with all requirements set forth in this section and shall remain continuously visible (“always on”). The label must maintain legibility and prominence of unit pricing information equivalent to printed labels.

(Amended 2025)

Section ~~67~~. 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 ~~78~~. 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:

Weights and Measures Officials:

- Multiple weights and measures officials supported this item and recommended Voting status.

Industry:

- None

Advisory:

- The representative from NIST OWM recommended Voting with editorial changes to Section 6.

Comments Against:

Weights and Measures Officials:

- None

Industry:

- None

Advisory:

- None

Neutral Comments:

Weights and Measures Officials:

- The weights and measures official from Arkansas recommended removing the status of promulgation map and just referencing the table showing the status of promulgation in the front of NIST Handbook 130.

Industry:

- None

Advisory:

- None

Item Development:

New Proposal 2026

NCWM 2026 Interim: Based on comments from the Arkansas weights and measures official the Committee deleted the map from the original proposal and added a section directing readers to where the summary of adoption by states can be found. The Committee also amended the item to reflect the editorial changes in the new Section 6 as suggested by NIST OWM; some of the language shown in the item wasn't the original or current language in HB 130. The Committee believes this item is fully developed and has moved this forward for Voting.

Regional Associations' Comments:

New Proposal

WWMA 2025 Annual Meeting:

No comments or status recommendation.

CWMA 2025 Interim Meeting:

Two regulators recommended developing 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 A 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 2026

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:

Weights and Measures Officials:

- A weights and measures official representing Colorado stated that the item is fully developed and recommended Voting status.

Industry:

- None

Advisory:

- None

Comments Against:

Weights and Measures Officials:

- None

Industry:

- None

Advisory:

- None

Neutral Comments:

Weights and Measures Officials:

- None

Industry:

- None

Advisory:

- The FALS Chair requested that the item be assigned to FALS for further development.

Item Development:

New Proposal

1 NCWM 2026 Interim: The Committee assigned this item to FALS for further development.

2 **Regional Associations' Comments:**

3 WWMA 2025 Annual Meeting:

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

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

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

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

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

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

21 The WWMA L&R Committee recommends a voting status.

22
23 CWMA 2025 Interim Meeting:

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

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

27 NEWMA 2025 Interim Meeting:

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

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

33 SWMA 2025 Annual Meeting:

34 Mr. Randy Jennings, Vice-Chair of FALS, also temporarily performing the duties of FALS Chair, and a participant on
35 the 7.2 Reproducibility Limits Focus Group commented that the Focus group chair Jenny Tabbert, CO, held several
36 virtual meetings this semester that resulted in the development of the language as presented. The Focus Group
37 Members support the amendment as presented and recommends a Voting Status. It is Mr. Jennings intent to convene
38 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, 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.

ECM – UNIFORM E-COMMERCE REGULATION

ECM-26.1 V 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.
 - (7) **Products such as wine and spirits must be unit priced in metric only in accordance with federal law.**
 - (8) **Unit pricing based on non-standard or ambiguous measures (e.g., “uses”, “servings”) is prohibited.**
- (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.

1 **(Amended 202X)**

2 ...

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

5 **10.1. GENERAL REQUIREMENTS.** – All information required to appear on the e-commerce site which
6 offers products for sale shall appear thereon in the English language and shall be prominent, definite, plain, and
7 conspicuous as to size and style of letters and numbers and as to color of letters and numbers in contrast to color
8 of background. Any required information that is either in hand lettering or hand script shall be entirely clear and
9 equal to printing in legibility.

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

12 (1) identity;

13 (2) net quantity;

14 (3) product price;

15 (4) brand or manufacturer name; and

16 (5) package picture or photographic representation/depiction.

17 **(6) Unit Price**

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

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

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

25 **(Amended 20XX)**

26 **Previous Status:**

27 New Proposal

28 **Original Justification:**

29 Including unit pricing on e-commerce websites is justified because it directly addresses the common challenge
30 consumers face in comparing product value across varying package sizes and brands. Without a standardized cost per
31 unit, shoppers may unintentionally overpay or overlook better-value options. Unit pricing eliminates ambiguity,
32 enabling data-driven purchasing decisions that can lead to increased customer satisfaction and stronger brand loyalty.
33 Additionally, many consumer advocacy groups and regulatory bodies promote or mandate unit pricing as a best
34 practice, meaning its adoption can help ensure legal compliance while signaling a retailer's commitment to transparency
35 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:

Weights and Measures Officials:

- Two weights and measures officials recommended putting it forward as Voting.

Industry:

- None

Advisory:

- The representative of NIST OWM recommended putting it forward as Voting.

Comments Against:

Weights and Measures Officials:

- None

Industry:

- None

Advisory:

- None

Neutral Comments:

Weights and Measures Officials:

- None

Industry:

- None

Advisory:

- None

Item Development:

New Proposal 2026

NCWM 2026 Interim: The Committee assigned Voting status to this item as it is fully developed and ready for a vote. The Committee amended the item to align with the language in the Uniform Pricing Regulations by adding numerals (7) and (8) to section 5.2.(a) with the following language:

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

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

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 item. The 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.

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

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

6 **3.X. Director. – The _____ of the Department of _____.**

7 **Section 4. Enforcing Official: Rules and Regulations**

8 **The Director is authorized to:**

9 **(a) enforce the provisions of this Act;**

10 **(b) issue reasonable regulations for the enforcement of this Act that shall have the force and effect of law;**
11 **and**

12 **(c) adopt rules that include, but are not limited to:**

13 **(1) adherence to the provided written quote from either the carrier or 3PL is required, contingent**
14 **upon the shipper supplying accurate and complete documentation pertaining to the shipment;**

15 **(2) the weighing, measuring, and freight class accuracies that must be followed;**

16 **(3) the required information that shall be submitted by both the carrier and 3PL to the shipper, if a**
17 **correction is applied; and**

18 **(4) the period of recordkeeping in accordance with Title 49 Subtitle B Chapter III Subchapter B Part**
19 **379 Appendix A;**
20

21 **Section 5. Weighing and Measuring Practices and Equipment Used**

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

24 **(a) in accordance with the requirements of the latest edition of NIST Handbook 44, "Specifications,**
25 **Tolerances, and Other Technical Requirements for Weighing and Measuring Devices"; and**

26 **(b) that have been examined, tested, and approved for use by either a weights and measures official or**
27 **authorized service provider. In the absence of an applicable NTEP program for said device, it shall be**
28 **used in accordance with the manufacturer's approved application.**

29 **Section 6. Weighing Device Used**

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

33 **Section 7. Measuring Device Used**

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

37 **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:

Weights and Measures Officials:

- Seven weights and measures officials supported the item and recommended that it remain Assigned.

Industry:

- None

Advisory:

- The representative from NIST OWM supported keeping the item assigned to the Work Group.

Comments Against:

Weights and Measures Officials:

- None

Industry:

- One representative from Industry voiced that the item is not finished and needs clarity.

Advisory:

- None

Neutral Comments:

Weights and Measures Officials:

- Multiple weights and measures officials recommended maintaining this item as Assigned.

Industry:

- None

Advisory:

- The Work Group Chair recommended maintaining this item as Assigned.

Item Development:

NCWM 2026 Interim: This item continues to be assigned to the Task Group as it is not yet fully developed. The Item under consideration reflects new language provided by the Task Group.

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 2026 Interim: Ms. Vanessa Benchea, FALS Chair, reported on the FALS activities during the open hearings and provide a written report for the Committee. The report is included below.

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

Background/Discussion:

L&R 2026 Annual Meeting Agenda

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

FALS convened on Sunday, January 11, 2026, at the 2026 NCWM Interim Meeting in Mobile, Alabama, with approximately 34 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.

The group discussed FLR-26.1 7.2 and MOS-26.3 section 2.20.

- For FLR-26.1 7.2, the group concluded with recommending the item be assigned to FALS where the Focus Group can further work to address the various concerns raised amongst the regions and within the subcommittee.

- For MOS-26.3 section 2.20, FALS took no position – some supported the proposal while others strongly opposed it. Regardless of whether the proposal is adopted, the group agreed this section and FLR 3.2.5 would need alignment.

Updates were provided by:

- Marilyn Herman for Subcommittee A (Gasoline and Oxygenated Fuels) and each state's implementation of ASTM D4814

- Randy Jennings for Subcommittee E (Burner, Diesel, and Non-Aviation Gas Turbine Fuels), and J (Aviation Fuels)

- Brian Kernke on the issue of premature plugging of dispenser filters that many retail facilities are continuing to deal with.

- Shailesh Lopes on the concerns and projects the Engine Manufacture Association (EMA) is currently looking into, which included Diesel Exhaust Fluid (DEF) in Fuel Contamination and developing a fuel specification for higher blend biodiesel fuels (up to B30).

One item of new business was the presentation from Henry Walczak requesting a template that could manage and align fuel specifications across the States.

Detailed minutes of this meeting will be distributed to FALS membership, including attachments with all presentations from the meeting.

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

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.

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:

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.

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 2026 Interim: Mr. Mike Smith, New York representing PALS updated the Committee on PALS activities and provided the following:

The Packaging and Labeling Subcommittee met on Sunday January 11, 2026. We shared and discussed the Draft Best Practice Document called, “Quantity related expressions on a principal display panel”. This document will provide guidance to manufacturers and regulators alike regarding the statements which appear in addition to a proper and correct Declaration of Net Quantity. We hope to have this document completed by March and plan to submit this to the NCWM Board shortly thereafter so that an expert panel can be established to review and publish as an NCWM best practice publication. PALS is optimistic that this document will be completed for the NCWM body, by the annual meeting in Philadelphia.

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.

1 CWMA 2025 Interim Meeting:

2 No comments.

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

4 NEWMA 2025 Interim Meeting:

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

7 SWMA 2025 Annual Meeting:

8 No comments were received during open hearing on this item.

9 The Committee recommends this item remain Developing.

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

12 **NET – HANDBOOK 133**

13 **NET-26.1 W Table 2-3. Moisture Allowances**

14 **Source:**

15 New Jersey Food Council

16 **Purpose:**

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

22 **Item under Consideration:**

23 Amend NIST Handbook 133 as follows:

24 **Previous Status:**

25 New Proposal

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	
<i>Cannabis</i>	3 %	<i>Cannabis</i> means plant material only, and not products containing <i>Cannabis</i> , 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).
<u>Fruits</u>	<u>6 %</u>	<u>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.</u>
<u>Vegetables</u>	<u>6 %</u>	<u>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.</u>

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:

Weights and Measures Officials:

- None

Industry:

- None

Advisory:

- None

Comments Against:

Weights and Measures Officials:

- Multiple weights and measures officials opposed the item citing insufficient data to support the requested moisture allowance and a broad categorization system which would group products with greatly different moisture loss profiles. They recommended withdrawing the item, although appreciation was expressed for the submitters' efforts and they were invited to resubmit with data provided for specific or narrowly categorized commodities.

Industry:

- None

Advisory:

- A NIST OWM advisor suggested the item should be withdrawn due to insufficient data and an overly broad categorization system.

Neutral Comments:

Weights and Measures Officials:

- None

Industry:

- The original submitter acknowledged the lack of data to support the requested moisture allowance and need for more narrowly defined categories but suggested assigning the item to a Work Group for further research.

Advisory:

- None

Item Development:

New Proposal 2026

NCWM Interim 2026: The Committee, hearing no support for this item withdrew it.

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

1 and fruits left out fungi, such as mushrooms, which is a form of produce. He also commented that the submitter has
2 not provided any data regarding moisture loss for any specific product and a blanket 6% is not appropriate. He also
3 commented that while the Supreme Court ruled that we must consider variation in product weight, those considerations
4 are already in place with Maximum Allowable Variations. To consider additional variations, data would need to be
5 provided on a case-by-case basis. New Jersey recommended this item be withdrawn. A regulator from Vermont
6 commented that he has performed a lot of package weighing over the years and 6% without a study is arbitrary and
7 recommends a withdrawn status. The representative on behalf of the NJFC pointed to the studies that were referenced
8 in the supporting document letter. A regulator from Westchester County, NY commented that if a comparison was to
9 be made from produce to a commodity in the Table, it would be cannabis. The representative on behalf of the NJFC
10 indicated that cannabis is still a federally illegal substance and should not be compared to produce. A regulator from
11 New York echoed the comments made by New Jersey and Vermont and recommended a withdrawn status.

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

14 SWMA 2025 Annual Meeting:

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

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

21 Several other state representatives echoed the state of West Virginia and Florida and recommended a Withdraw status.

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

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

25 **ITEM BLOCK 4 (B4) MOISTURE ALLOWANCE CONSIDERATION**

26 **Source:**

27 Michigan Department of Agriculture & Rural Development

28 **Purpose:**

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

30 **Previous Status:**

31 2025: New Proposal Assigned to Work Group after 2025 Annual Meeting

32 **Original Justification:**

33 This is a companion item to those changes requested for HB133.

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

38 Some industries may believe "moisture allowance" should be used as a tolerance and have always used it as same.
39 There may also be enforcement jurisdictions that want to continue to use it as a tolerance rather than conducting
40 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 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 allowances considerations may be applied before or after the package errors are determined.

To apply an 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 allowances 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 allowances **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 Allowances **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 Allowances **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 Allowances **Considerations**.”)

Table 2-3. Moisture Allowances <u>Considerations</u>		
Verifying the labeled net weight of packages of:	Moisture Allowance <u>Consideration</u> 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	
<i>Cannabis</i>	3 %	<i>Cannabis</i> means plant material only, and not products containing <i>Cannabis</i> , 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 4 th 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 <u>Considerations</u>	
(1)	There is no moisture allowance <u>consideration</u> 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 <u>Considerations</u> ,” 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 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 conducting additional investigations into the root cause of shortages found in those packages that allow moisture consideration.

Comments in Favor:

Weights and Measures Officials:

- None

Industry:

- None

Advisory:

- None

Comments Against:

Weights and Measures Officials:

- None

Industry:

- None

Advisory:

- None

Neutral Comments:

Weights and Measures Officials:

- Multiple Weights and Measures officials rose to support the work of the Work Group and recommended that it continue to develop this item.

Industry:

- None

Advisory:

- None

Item Development:

NCWM 2026 Interim: This item remains assigned to the Work Group. The Committee deleted 4.10.2.2. Moisture Shrinkage Allowance Consideration for Structural Plywood and Wood-based Structural Panels and 4.11.2.1. Shrinking

Allowance Consideration from the title because it was previously agreed that plywood would not be part of the proposed changes to this item.

Mr. Kurt Floren (County of Los Angeles, California), a member of the Moisture Allowance Task Group, provided a presentation on the task group efforts.

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.

1 NEWMA 2025 Interim Meeting:

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

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

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

8 SWMA 2025 Annual Meeting:

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

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

13 Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to
14 <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

Appendix A

Quantity-Related Expressions on a Principal Display Panel



Quantity-Related Expressions on a Principal Display Panel

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DRAFT 03/31/2026

Table of Contents

Contains Nonbinding Recommendations

Guidance and Recommendations to Manufacturers and Regulators on Best Practices for U.S. Packages

Quantity-Related Expressions Appearing on the Principal Display Panel separate from the Required Statement of Quantity

This document is intended to provide guidance and recommendations regarding best practices for quantity-oriented expressions which appear on a product Principal Display Panel (PDP) in addition to the required Declaration of Net Quantity (DoNQ). The National Council on Weights and Measures (NCWM) has drafted this document to help manufacturers, regulators and retailers assure this added information is truthful, non-misleading and is presented in a manner that complements the required Declaration of Net Quantity.

Introduction

4

Organization of Document
Discussion of Supplemental Statements

Background

6

Expression Categories

7

1. Additional Expression of Quantity
2. Reconstituted Expression of Quantity
3. Derived Unit Expression
4. Comparative Quantity Representation
5. Comparative Performance Representation

Principles & Recommendations by Expression Category

15

Table 1: Summary of Principles

Table 2: Expression Principles and Guidance

1. Should be useful for consumers
2. Must be accurate and verifiable
3. Must be clear and unambiguous
4. Must not conflict with mandatory Declaration of Net Quantity (DoNQ)
5. Location and prominence must be balanced against Declaration of Net Quantity
6. Should provide consumer relevant information
7. Should not conflict with units of Legal Metrology
8. Must provide directions for how to reconstitute
9. Must provide definition of derived unit
10. Derived unit must be consistent across similar products
11. Comparative expression must appear in its entirety in upper 70% of Principal Display Panel (PDP)
12. If no reference to recognized units of Legal Metrology, must be balanced and complete

Enforcement

29

Appendix 1: Supplemental Statements

30

Appendix 2: Illustrations and Discussion of

35 **Voluntarily Added Expressions**

Introduction

A number of product package Principal Display Panel (PDP) labels provide additional information regarding product quantity or product performance beyond the information provided in the required Declaration of Net Quantity (DoNQ). In some instances, providing additional information that is not present in the DoNQ can help consumers make more informed product selections. In other instances, providing additional information can help consumers more easily identify the product size they seek. In still other instances, providing additional information can help educate consumers about a new product form or concentration. In short, there are a number of appropriate reasons why a product manufacturer may feel compelled to provide additional information for consumers and also why consumers would want and use this information to make better and more informed product purchase decisions.

While federal and state laws and regulations provide substantial detail regarding the accuracy, location, and appearance of the information appearing in the required Declaration of Net Quantity, provisions for the accuracy, location, and appearance of other quantity-related expressions which manufacturers may add to the PDP relate to general requirements pertaining to product claim content truthful and non-misleading statements. Yet there is little information available to guide manufacturers in the presentation of added quantity-related expressions and information. While the majority of product PDPs that provide consumers additional information do this effectively in a manner that aids consumers, package PDP labels that have caused concerns amongst regulators and consumers have been identified periodically. In several previous instances, certain product PDP labels have been submitted to the NCWM for possible development of regulations targeting a specific practice viewed to be of concern. To date, the consensus of the NCWM has been that the development of this best practice document for manufacturers is a better and more holistic solution as opposed to narrowly targeted regulation. It is believed that best practice information will be valuable to manufacturers at the time they are contemplating package label design, it will assist regulators by providing a source they can direct questions and concerns, and the result will be providing consumers with the best information possible at the time they make value comparisons and product selections.

The recommendations contained herein are intended to provide guidance to manufacturers contemplating the inclusion of additional expressions on their packages to ensure the expressions are clear, accurate, balanced, and non-misleading. These recommendations are also intended to help regulators responsible for package labeling requirements create more consistency in the marketplace.

Organization of Document

This Best Practice document is organized into the following sections to help the user focus on a specific topic, although it is recommended that the document be viewed in its entirety first.

- Discussion of Supplemental Statements
- Background on Additional Expressions
- Categories of Expressions
- Principles and Recommendations by Expression Categories
- Enforcement Discussion
- Supplemental Statement Requirements and Interpretations (Appendix 1)
- Illustrations and Discussion of Voluntarily Added Expressions (Appendix 2)

The recommended procedure for using this document is to first identify the category (or categories) an expression fits within and then to review the detailed principles and recommendations that apply to that category (or categories).

Discussion of Supplemental Statements

A common question is whether statements of the type described in this Best Practice Document would be considered “supplemental statements” and, therefore, not lawfully allowed on the Principal Display Panel (PDP). This question stems from a Fair Packaging and Labeling Act (FPLA) provision that allows supplemental statements that describe the net quantity in nondeceptive terms, provided they appear “at other places on the package” than the net quantity of contents statement and existing regulations that state supplemental statements should not appear on the PDP.

A close review of regulatory precedent reveals surprisingly few statements that have been considered “supplemental” by regulators over the past fifty years. Only one example of formal agency guidance identifying a specific statement as supplemental was located – an FDA determination that a weight declaration is supplemental on a product for which the net contents must be declared in fluid ounces. (FDA Fair Packaging and Labeling Manual Guide 7563.15 – historical – no longer published.) In contrast, numerous statements have been expressly determined to be not supplemental, including directions for use, reconstitution statements (e.g., Makes 1 quart), voluntary declarations of drained weight combined with total package weight including packing liquids, voluntary declarations of count, and metric labeling (prior to metric labeling being mandatory). Numerous other statements have existed in the marketplace for years without challenge. Finally, in an era where consumers increasingly demand more information about the products they purchase and use, regulatory agencies are recognizing that providing accurate information in clear and non-misleading ways would appear to be beneficial to consumers. Additional detail regarding the history of supplemental statements is in Appendix 1.

In light of the regulatory history, the statements in this Best Practice Document are not considered to be prohibited from appearing on the PDP. Every manufacturer, however, must make independent judgments and be prepared to explain why individual statements are permissible. Similarly, regulators may question specific package PDP statements that they believe are misleading or cause consumer confusion.

Background

Manufacturers are responsible for supporting all statements that appear on their labels, including voluntary expressions related to package quantity. Federal and state laws and regulations require voluntary quantity-related claims to be truthful and substantiated and, correspondingly, prohibit false or misleading information. For example, weights and measures laws commonly prohibit selling less than the represented quantity or representing the quantity in a manner that tends to mislead or deceive another person.² Consumer protection laws prohibit unfair and deceptive trade practices, such as the failure to possess a reasonable basis (substantiation) for objective claims.³

Federal agencies, including the Federal Trade Commission (FTC), the Food and Drug Administration (FDA), State regulatory agencies, and the National Advertising Division of the Council of Better Business Bureaus, may implement laws, regulations, and standards relating to quantity-related information.⁴ This document is intended as a resource for both industry and regulators in evaluating voluntary quantity-related statements. For example, industry may find the guidance useful in developing claims and product labeling, and regulators may refer companies to the guidance when questions arise about the usefulness, implementation, or legal status of claims under federal or state requirements.

The purpose of this document is not to redefine or re-interpret existing provisions for the required Declaration of Net Quantity required by the U.S. Fair Packaging and Labeling Act (FPLA) and the regulations promulgated to implement FPLA. This document also does not establish or address methods of sale. Existing Declaration of Net Quantity requirements are the baseline for regulatory compliance, and every recommendation in this document presumes the package already has a compliant Declaration of Net Quantity.

This recommended practice represents the current thinking of the National Council on Weights and Measures (NCWM). As guidance, this document does not establish legally enforceable rights or responsibilities. It does not legally bind either the public, federal or state regulators, and adherence to these guidelines do not ensure legal compliance. Additionally, companies may choose an approach other than the one set forth in this guidance document if it complies with the relevant statutes and regulations.

² See, e.g., NIST Handbook 130– Uniform Weights and Measures Law § 15 (Misrepresentation of Quantity).

³ See, e.g., Federal Trade Commission Act § 5 (15 U.S.C. § 45).

⁴ The National Advertising Division of the Council of Better Business Bureaus offers an alternative dispute resolution service that reviews claims made in national advertisements.

Expression Categories

In developing this best practice document, the National Council on Weights and Measures evaluated products in the marketplace to better understand the different kinds of expressions currently appearing on the Principal Display Panel (PDP) in addition to the Declaration of Net Quantity (DoNQ) required by the U.S. Fair Packaging and Labeling Act (FPLA). Some of the expressions employ units of legal metrology (such as pound, ounce, fluid ounce, quart, liter, gram, kilogram, or count) while others appear in non-metrological units which relate to how a consumer might use the product (such as dose, use, load, application, pump, or scoop). Some provide information regarding how much product is produced once the contents have been reconstituted. Some statements are exact, others are inexact. Finally, some statements compare product usage or quantity to other products.

After evaluation of the various expressions currently appearing on the PDP in addition to the Declaration of Net Quantity, the NCWM has created the following five general categories for these statements.

1. Additional Expression of Quantity
2. Reconstituted Expression of Quantity
3. Derived Unit Expression
4. Comparative Quantity Representation
5. Comparative Performance Representation

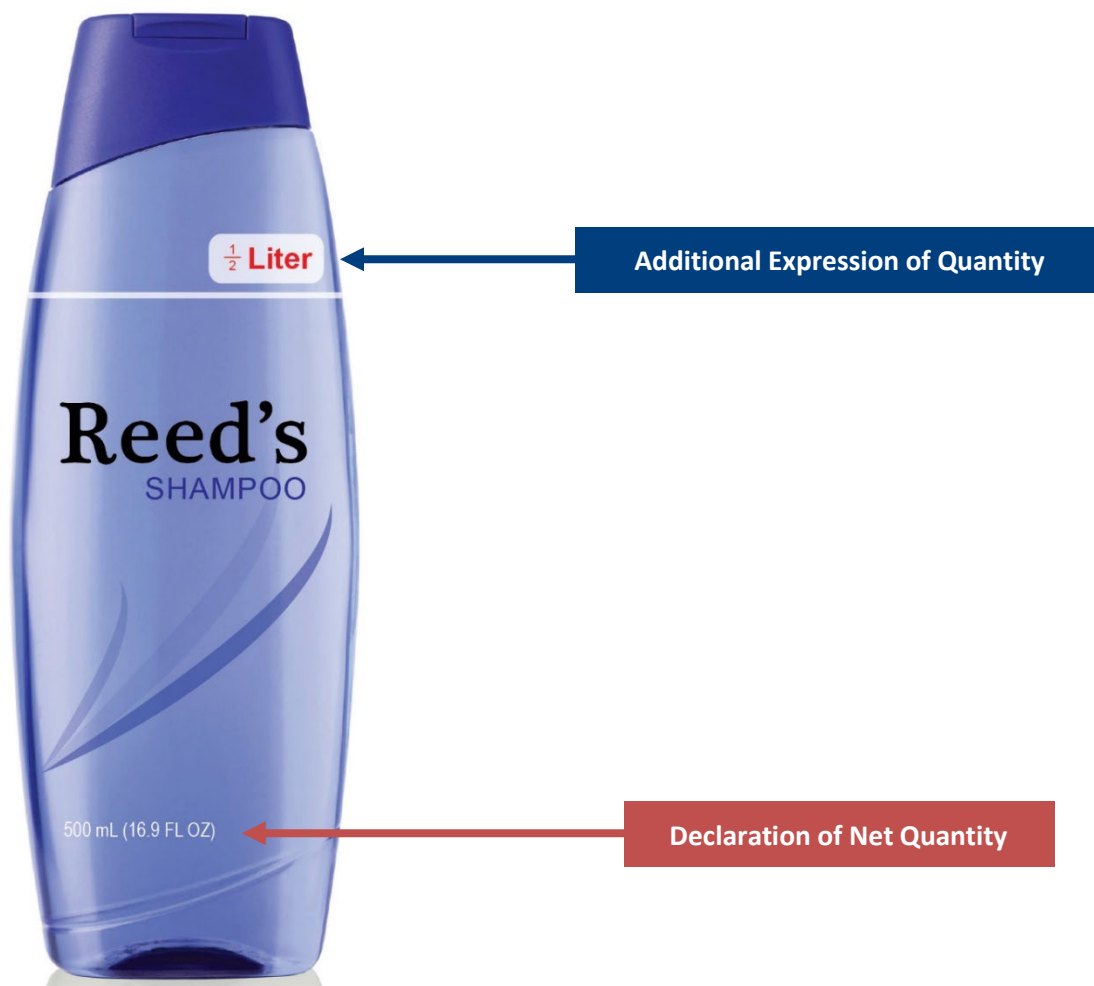
This document provides recommended practices for each of these categories with the overall purpose of promoting the communication of useful information to consumers at the point of purchase.

1. Additional Expression of Quantity (AEQ) – an exact expression of a quantity appearing on the Principal Display Panel (PDP) in terms of legal metrology weight or measure, count or a defined unit of measure which is neither part of nor intended to be part of the required Declaration of Net Quantity (DoNQ). This expression may be identical to a declaration which is part of the DoNQ, may be a declaration equivalent to a declaration contained in the DoNQ, or be another accurate declaration expressing quantity in units or count not present in the DoNQ.

In the package below, the Additional Expression of Quantity (AEQ) would be the “6 Doughnuts” expression which is present on the PDP in addition to the required Declaration of Net Quantity.



Similarly, the AEQ in the package below would be the “1/2 Liter” expression present in addition to the required DoNQ.



Additional examples of an Additional Expression of Quantity would be:

- Statement “1 Quart” separately appearing on the PDP from the Declaration of Net Quantity reading “1 Quart (0.946 Liters)”
- Statement “32 Fluid Ounces” separately appearing on the PDP from the Declaration of Net Quantity reading “1 Quart (0.946 Liters)”
- Statement “1.5 Liters” separately appearing on the PDP from the Declaration of Net Quantity reading “1.5 Liters (1.58 Quarts)”.
- Statement “3 Pounds” separately appearing on the PDP from the Declaration of Net Quantity reading “3 Pounds (1.36 Kilograms)”
- Statement of “24 Count” separately appearing on the PDP from the Declaration of Net Quantity reading “3 Pounds (1.36 Kilograms)”

- Statement “1/2 Kilogram” separately appearing on the PDP from the Declaration of Net Quantity reading “500 Grams (1.1 Pounds)”
- Statement “2 Dozen Cookies” separately appearing on the PDP from the Declaration of Net Quantity reading “2 Pounds (907 Grams)”
- A Declaration of Identity “8 Ounce Steaks” appearing in addition to a PDP Declaration of Net Quantity

2. Reconstituted Expression of Quantity (REQ) – an exact expression appearing on the Principal Display Panel (PDP) in addition to the Declaration of Net Quantity (DoNQ), which details how much product the package contents provide when the product is prepared in accordance with label directions. This expression is most common for products requiring the addition of water but may be appropriate for other products. This expression is generally most useful to consumers when the prescribed directions for product preparation are very straightforward, such as the addition of just water. These statements are less useful when multiple steps or added ingredients are involved.

In the package diagram below, the Reconstituted Expression of Quantity (REQ) would be the “Makes 56 Quarts” expression which is present on the PDP in addition to the required Declaration of Net Quantity (DoNQ).

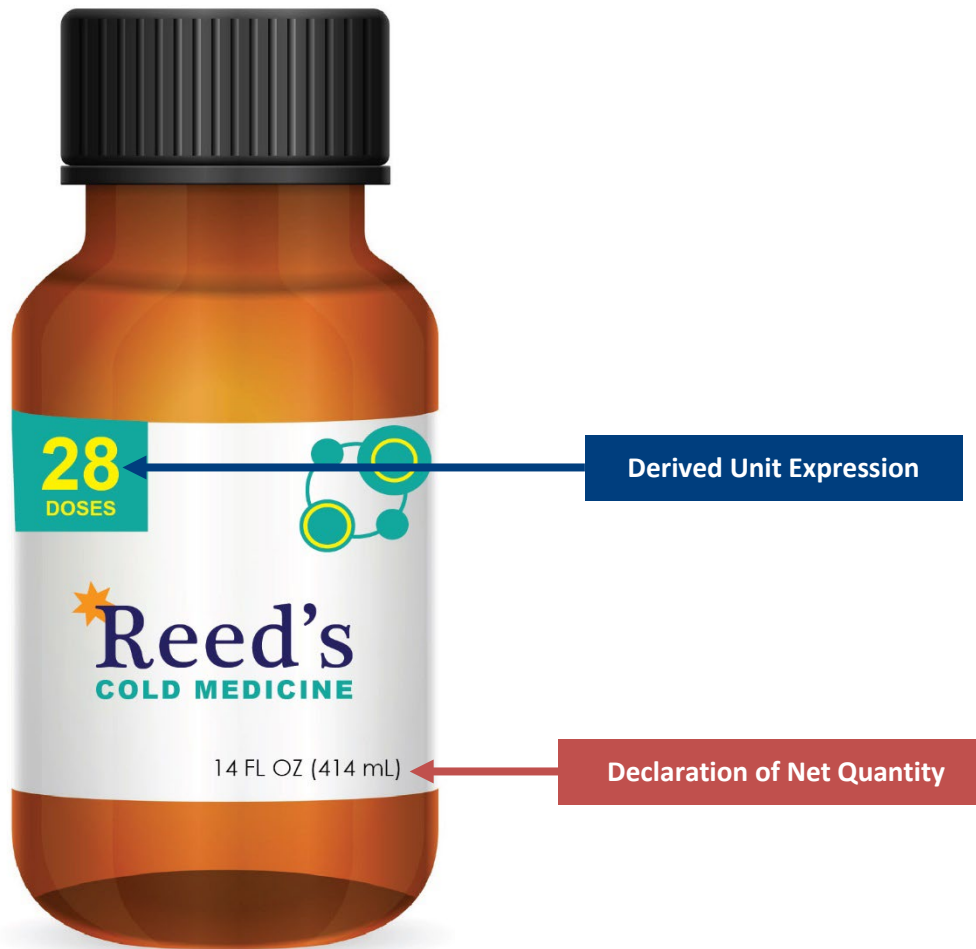


Additional examples of a Reconstituted Expression of Quantity (REQ) would be:

- Statement “Makes 12 Gallons” separately appearing on the PDP from the Declaration of Net Quantity reading “8 Ounces (226 Grams)”
- Statement “Makes 2 Liters” separately appearing on the PDP from the Declaration of Net Quantity reading “4 Ounces (113 Grams)”
- Statement “Makes 50 Liters” separately appearing on the PDP from the Declaration of Net Quantity reading “1.5 Liters (1.58 Quarts)”
- Statement “Makes 20 Quarts” separately appearing on the PDP from the Declaration of Net Quantity reading “1 Liter (1.05 Quart)”

3. Derived Unit Expression (DUE) – an exact expression appearing on the Principal Display Panel (PDP) in addition to the Declaration of Net Quantity (DoNQ) which expresses a quantity in terms of a unit that is not a recognized unit of weight or measure within Legal Metrology or prevailing systems of measurement (e.g., the U.S. Customary or metric systems). The derived unit may be based upon a recognized unit of measure and/or be based on a measurable factor related to consumer usage.

In the package diagram below, the Derived Unit Expression (DUE) would be the “28 Doses” expression which is present on the PDP in addition to the required Declaration of Net Quantity.



In the following package diagram, the Derived Unit Expression (DUE) would be the “20 Loads” expression which is present on the PDP in addition to the required Declaration of Net Quantity.



Additional examples of a Derived Unit Expression include the following:

- Statement “50 Uses” appearing on the PDP when Declaration of Net Quantity reads “8 Ounces (226 Grams)”
- Statement “75 Applications” appearing on the PDP when Declaration of Net Quantity reads “1.5 Liters (1.58 Quarts)”
- Statement “75 20-mL Applications” appearing on the PDP when Declaration of Net Quantity reads “1.5 Liters (1.58 Quarts)”
- Statement “30 Loads” appearing on the PDP when Declaration of Net Quantity reads “2 Pounds (907 Grams)”

4. Comparative Quantity Representation (CQR) – an expression appearing on the Principal Display Panel (PDP) in addition to the Declaration of Net Quantity (DoNQ) which compares the contents of that package to the contents of a comparable product package produced by the same or a different manufacturer. This comparative statement may be a statement of equivalence (e.g., “This Package Contains the same 24 FL OZ as our old Package”), a statement of differentiation (e.g., “This Box Contains 1 Pound more than Reed’s LARGE SIZE Box”) or another accurate and verifiable comparative statement.

In the package diagram below, the Comparative Quantity Representation (CQR) would be the “Makes 8 Quarts More than Other 2 LB Juice Mixes” expression which is present on the PDP in addition to the required Declaration of Net Quantity and the optionally added Reconstituted Expression of Quantity (REQ).



In the following package diagram, the Comparative Quantity Representation (CQR) would be, “This 8 Pound package contains the same Volume as our 15 Pound regular product” expression which is present on the PDP in addition to the required Declaration of Net Quantity.

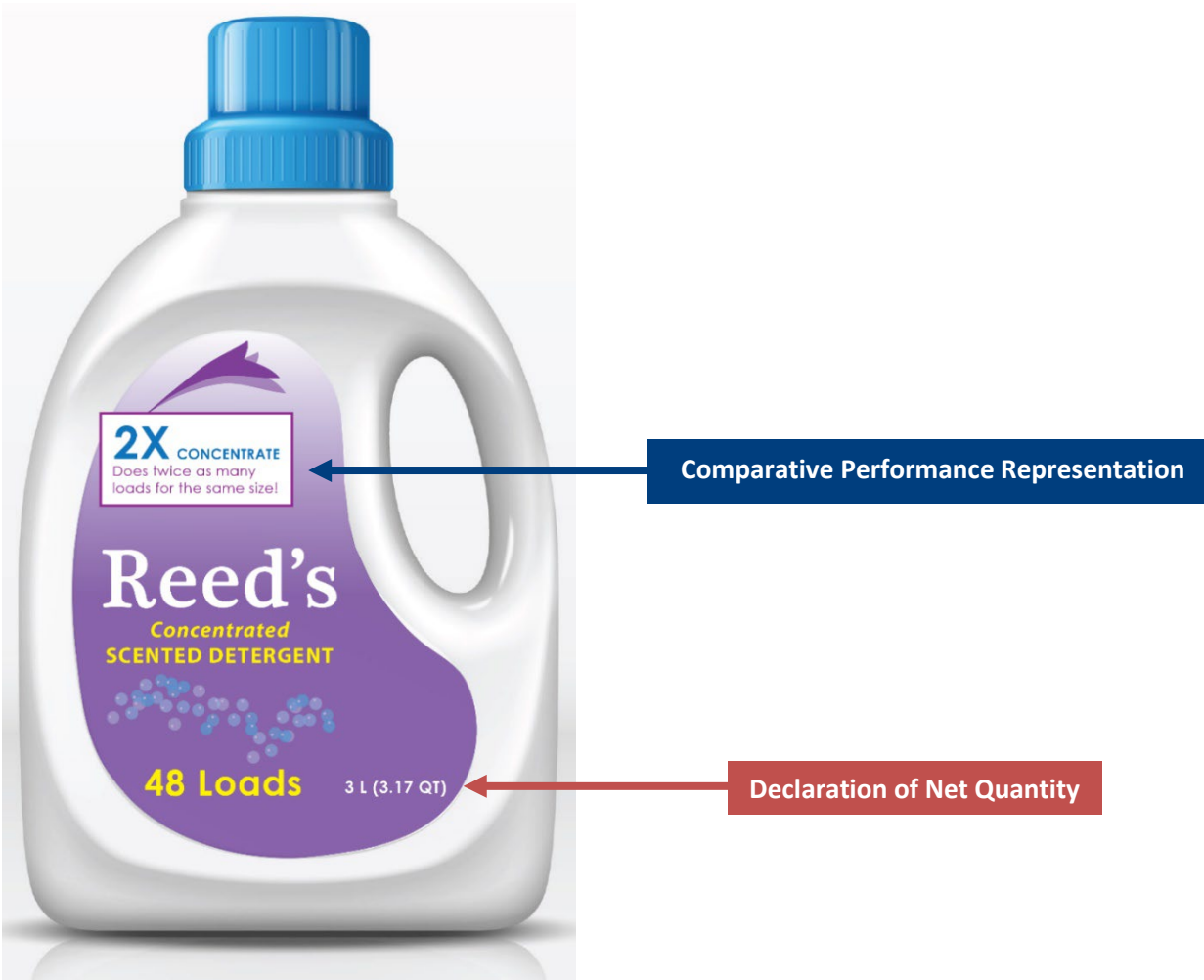


Additional examples of a Comparative Quantity Representation include the following:

- Statement “Contains 1 Pound more than Brand X Largest Size” appearing on the PDP when Declaration of Net Quantity reads “5 Pounds (2.26 Kilograms)”
- Statement “Contains 2 Ounces More than Brand Y 12 Ounce Box” appearing on the PDP when Declaration of Net Quantity reads “14 Ounces (396 Grams)”
- Statement “Contains the Same 1.5 Liters as Our Old Package” appearing on the PDP when Declaration of Net Quantity reads “1.5 Liters (1.58 Quarts)”
- Statement “Contains 5 More Widgets than Brand Z 20 count Super Widget Assortment” appearing on the PDP when Declaration of Net Quantity reads “2 Pounds (907 Grams)”
- Statement “8 Big Rolls = 12 Regular Rolls” appearing on PDP with correct Declaration of Net Quantity for Paper Towel Product.

5. Comparative Performance Representation (CPR) – an expression appearing on the Principal Display Panel (PDP) in addition to the Declaration of Net Quantity (DoNQ) that compares the performance of that package to the performance of a comparable product package produced by the same or a different manufacturer. Examples of Comparative Performance Representations would include expressions such as “Same number of Uses as our Regular 18 Ounce Size”, “This Package Does 5 More Loads than Reed’s 4 Pound Powder Package”. “Lasts as long as Reed’s 2 Pound Freshening Bar”.

In the package diagram below, the Comparative Performance Representation (CPR) would be the “Does twice as many loads for the same size!” expression which is present on the PDP in addition to the required Declaration of Net Quantity and the optionally added Derived Unit Expression (DUE).



Examples of a Comparative Performance Representation include the following:

- Statement “Same Uses as our Regular 18 Ounce Size Product” appearing on the PDP when Declaration of Net Quantity reads “8 Ounces (226 Grams)”
- Statement “20 more Doses than our Regular Size” appearing on the PDP when Declaration of Net Quantity reads “4 Ounces (113 Grams)”
- Statement “Lasts 2 Months Longer than Brand M” appearing on the PDP when Declaration of Net Quantity reads “1.5 Liters (1.58 Quarts)”

- Statement “Double the Absorptive Ability as Regular 20 Pound Products” appearing on the PDP when Declaration of Net Quantity reads “12 Pounds (5.44 Kilograms)”

Principles & Recommendations by Expression Category

In developing category principles and recommendations, the NCWM recognized that some principles should apply broadly across all or most expression categories while others may apply narrowly to a single or limited number of expression categories. To develop principles and recommendations that do not contain category-by-category repetition, the NCWM is providing the information in a tabular fashion.

This document has been drafted according to the schematic below with the presumption that a user would:

- 1) Determine the applicable expression category from the definitions above,
- 2) Determine which principles should be evaluated based on Table 1, and
- 3) Review the additional guidance available in Table 2 as needed. Table 1 identifies the principles generally applicable to each expression category, and Table 2 provides further details and guidance on each principle.

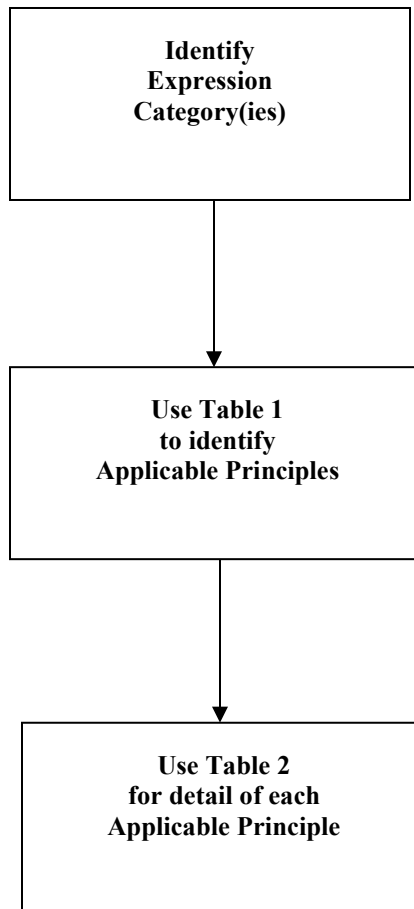


Table 1: Summary of Principles

Principles	Additional Expression of Quantity AEQ <i>“24 Buns”</i>	Reconstituted Expression of Quantity REQ <i>“Makes 2 gallons”</i>	Derived Unit Expression DUE <i>“20 Loads”</i>	Comparative Quantity Representation CQR <i>“40% More Litter Per Pound”</i>	Comparative Performance Representation CPR <i>“Lasts 25% Longer”</i>
Expression should provide useful information to help consumers.	X	X	X	X	X
Expression must be accurate and verifiable.	X	X	X	X	X
Expression must be clear and unambiguous.	X	X	X	X	X
Expression must not conflict with mandatory Declaration of Net Quantity (DoNQ).	X	X	X	X	X
Expression location and prominence (size, font, and contrast) must be balanced against the Declaration of Net Quantity (DoNQ).	X	X	X	X	X
Expression should provide Consumer Relevant Information.	X	X	X	X	X
Expressions should not conflict with units of Legal Metrology.			X	X	X
Package Label must provide directions for how to reconstitute.		X			
Package Label must provide definition of derived unit.			X		X
Derived Unit definition must be consistent across similar products.			X		X
Comparative expression must be balanced, complete and appear in its entirety in the upper 70% of the Principal Display Panel (PDP).				X	

Principles	Additional Expression of Quantity AEQ <i>“24 Buns”</i>	Reconstituted Expression of Quantity REQ <i>“Makes 2 gallons”</i>	Derived Unit Expression DUE <i>“20 Loads”</i>	Comparative Quantity Representation CQR <i>“40% More Litter Per Pound”</i>	Comparative Performance Representation CPR <i>“Lasts 25% Longer”</i>
Comparative expression which does not contain a reference to recognized units of Legal Metrology must be balanced and complete.					X

Table 2: Expression Principles and Guidance

Principle and Scope	Detailed Guidance
1. Expression should be useful for consumers. <i>How does the expression provide practical and helpful information to assist consumers?</i> (Applies to all categories)	Manufacturers should consider whether providing quantity-related information beyond what is in the mandatory Declaration of Net Quantity (DoNQ) will be useful for consumers, and if so, how. Does the expression increase the clarity of quantity information, educate consumers about product quantity or performance, meaningfully assist with value comparisons, or provide other benefits? Generally, an additional quantity expression should have a logical or research-based rationale for why the information is useful to consumers. For example, voluntary expressions may— 1. Help consumers quickly identify a product on the shelf when there are many similar products in various sizes. 2. Help consumers evaluate products used in different forms (liquid or solid) and different levels of concentration – for example, products that require water to be added as compared to those already containing water. 3. Provide a common frame of reference for consumers to make quantity comparisons across multiple possible product forms. 4. Help consumers understand that a new product has a different product concentration or density and how this new product compares to other products. 5. Educate or reassure consumers about a product in comparison to a previous version of the product or a competitive product. Not every product requires a voluntary expression.
2. Expression must be accurate and verifiable. <i>Is the statement true?</i> <i>Can statement accuracy be verified?</i> (Applies to all categories)	Voluntary expressions that contain quantity-related information must be accurate and verifiable using appropriate objective evaluative procedures and are subject to external evaluation and confirmation. For expressions using defined units of measure or count, accuracy should be based on test methodologies recognized by appropriate authorities such as a federal, state or international agency or standards organization. This includes content expressions embedded in a Declaration of Identity. For expressions relating to product reconstitution, accuracy should be based upon the directions for product preparation appearing on the product label and test methodologies recognized by appropriate authorities such as a federal, state, or international agency or standards organization. For Derived Unit Expressions (DUEs) and Comparative Performance Representations (CPR's), accuracy should be based upon the unit definitions (which

Principle and Scope	Detailed Guidance
	must be present on the product label) and verified using objective testing procedures. For example, since a Derived Unit Expression (DUE) does not use a unit of legal metrology, a manufacturer must define that unit on the package label, ensure an appropriate test method or validation process for quantifying the unit has been established, and ensure the expression appearing on the Principal Display Panel (PDP) is accurate and verifiable. Where possible, the accuracy of the declaration should be based on test methodologies recognized by appropriate authorities such as a federal, state or international agency of authority. Statement accuracy must be supportable by manufacturer data and is subject to external evaluation and confirmation.
3. Expression must be Clear and Unambiguous <i>Is the intended meaning easy to understand?</i> (Applies to all categories)	Voluntary expressions which contain quantity-related statements must be clear and unambiguous. Short expressions appearing in terms of recognized units with little to no modification such “2 Cups”, “5 Yards of Twine”, “1.5 Kilograms” or “3 Liters of Water” are typically straightforward and are generally presumed to be clear and unambiguous. The use of additional language accompanying quantity-related terms requires careful consideration and evaluation to ensure their clarity, accuracy, and relevance. Statements that do not provide information to the consumer about the contents of a specific package should not appear on the Principal Display Panel (PDP). - Expressions that contain quantity information and appear on the PDP separate from the DoNQ must be accurate, non-misleading, useful, relevant, and verifiable on the basis of the content of the individual package. Statements such as “Approximately 50 Cookies”, “About 2 Cups”, “300 Pencils on Average” or “Up to 50 Cookies” provide little assurance of the quantity contained in any given individual package. In these examples, a consumer purchasing one package may receive less than the amount stated in the expression, more than the amount stated in the expression or exactly the stated amount. While a statement of “approximately 25 candy bars” may be a technically correct statement based on manufacturing variability, this statement provides a consumer who purchases a single package with little assurance that the specific package they select contains 25 – it may be more, it may be less. As a result, statements using “about,” “approximately,” “up to” and similar terms are not recommended to appear on the PDP because they are generally considered unclear and ambiguous. - An expression such as “Contains Less than 49 Cookies” may be an accurate and verifiable statement but does not provide the consumer with relevant and useful information. - An expression such as “Good for 30 Applications” provides clear and verifiable information which can be verifiable whereas expressions such as “Provides Up to 30 Applications” or “30 Applications on Average” may overestimate or underestimate what a consumer should expect. Expressions regarding reconstituted quantities must, clearly indicated information about the amount of ready-to-use product a consumer should expect a package to deliver based on clear label instructions for product preparation. These statements would have to be clearly distinct from the required net quantity information provided in the DoNQ. In many instances, manufacturers use icons to provide reconstituted

Principle and Scope	Detailed Guidance
	information since icons efficiently provide both reconstituted product information and distinctness and separation from the DoNQ. Expressions containing a derived unit require that the manufacturer define the derived unit on the package label so that it is available for consumer inspection prior to product purchase. Expressions that include one or more derived units have to be clearly distinct from the information provided by the required Declaration of Net Quantity (DoNQ). In many instances, manufacturers use icons to provide derived unit information since icons are an effective means to provide additional consumer information which is clearly distinct from the DoNQ. Comparative statements, including Comparative Quantity Representations (CQRs) and Comparative Performance Representations (CPR's), need to be complete and balanced expressions which help the consumer understand how the package with the statement compares to other packages. While product comparison information provided by CQRs and CPR's can often be difficult to communicate in a limited amount of space or limited number of words, it is imperative that a manufacturer ensure a comparative statement appearing on the PDP is a complete, stand-alone statement. While an asterisk may be used to provide additional information substantiating the comparative statement, a manufacturer should not rely on the asterisked information to explain what a comparative statement really means. When an asterisk is used, the added information needs to be provided on the outer package label in a location and font type consistent with other regulatory required information required on other non-PDP panels of the package. Comparative statements must be complete, meaning they can stand on their own in communicating enough information for a consumer to correctly understand the intended message without having to inspect the rest of the package.
4. Expressions must not Conflict with the Information in the Mandatory Declaration of Net Quantity (DoNQ). <i>Is the statement consistent with the mandatory DoNQ?</i> (Applies to all categories)	Voluntary expressions which contain quantity-related information should provide information which is equivalent to or consistent with the information present in the required DoNQ. Expressions may: 1. Simply repeat a portion of the of the DoNQ, such as "2 Pounds" 2. Provide an equivalent information such as "4 Quarts" when DoNQ states "1 gallon". 3. Provide accurate and consistent information such as "Over 1 Quart" when DoNQ is "1 Liter". 4. Provide information in terms of other legal metrological units not represented in the DoNQ such as a volume declaration when product is labeled "2 pounds". 5. Provide information in terms of count that is not provided in the DoNQ 6. Provide information on the reconstituted quantity consistent with the declared net quantity and preparation instructions. 7. Provide information in terms of a derived unit consistent with the definition of the derived unit provided on the package. 8. Provide comparative information that accurately accounts for the quantity information in the DoNQ Information provided in voluntary expressions on the package Principal Display Panel (PDP) should supplement the information required to be provided in the DoNQ. Voluntary expressions should be evaluated by the manufacturer to ensure the message and information is consistent with what is provided in the DoNQ. For example, if a package label defines the term "dose" to be 2 fluid ounces, a package containing 1 quart with an expression in doses should state the package contains 16 doses. An expression

Principle and Scope	Detailed Guidance
	of “17 Doses” or “20 Doses” would not be consistent. Similarly, a package labeled “1 Liter” should not contain an expression such as “contains at least 1 Liter” since that is fundamentally a different statement.
5. Expression location and prominence (size, font, and contrast) must be considered in relation to the Declaration of Net Quantity (DoNQ) to ensure appropriate balance. <i>Does the expression location, size, font contrast, and other attributes effectively provide information in addition to the DoNQ?</i> (Applies to all categories.)	Manufacturers should consider the cumulative effects of quantity statement location, size, font, color, and contrast on the package in relation to those of other Principal Display Panel (PDP) elements and statements. The location, size, and contrast of a voluntary quantity-related expression should help the consumer make informed value comparisons at the point of purchase and not minimize the visibility or purpose of other information required to appear on the PDP. Importantly, an expression should complement or reinforce the information provided by the DoNQ and should not compete with or replace the visibility of the required DoNQ . When an expression is added to the PDP, the manufacturer should consider the location, size, font, contrast, and other attributes of the expression in relation to the location, size, font and contrast of the DoNQ to ensure they are reasonably balanced. The goal for reasonable balance is to ensure the expression and DoNQ information are effectively communicated to the consumer at the point of purchase. Reasonable balance does not mandate that voluntary expressions must match the size, font, contrast, or other attributes of the DoNQ. Reasonable balance does allow manufacturers to adjust the size (generally equal or larger), adjust the font (generally bolder), modify the contrast (brighter colors, use of icons, banners, and backgrounds) and determine a location (top 70% of the PDP, lower 30% of PDP, distance from the DoNQ), to maximize the visibility of the added expression and the DoNQ. Combining a voluntary quantity expression and the required DoNQ into a common box or other graphical/visual representation that appears to link both is not recommended. The DoNQ is mandated in law and regulation to have separation from other expressions on the PDP and added expressions need to be clearly separate from the DoNQ but in terms of required separation and visual presentation. Since a DoNQ is mandated and required to appear in a limited portion of the PDP where consumers know where it can be found, manufacturers are generally going to design a voluntary expression to maximize the chances the expression is also seen at the point of purchase by the consumer. A voluntarily added expression will generally be of equal or larger size, a different font, and higher contrast than the information provided in the DoNQ since these characteristics are important to help ensure a consumer sees and understands these statements at the time a consumer is making product selections. Not every product has or needs to have a voluntary expression related to quantity added to the PDP, and as a result, for those packages that a manufacturer believes warrant this added information, the manufacturer is attempting to make this information visible to a consumer who may not be necessarily looking for this information. As a result, the manufacturer is going to give this added expression greater prominence than the DoNQ. In doing this, the manufacturer must ensure the visibility of the information provided in the DoNQ is not compromised by the use of fonts, colors, and contrasts which largely mask the visibility of this information at the expense of the added expressions. In general, an expression that repeats information present in the required DoNQ is more likely to be useful to a consumer if it is substantially separated from the DoNQ.

Principle and Scope	Detailed Guidance
	Similarly, an expression that provides quantity-related information that is not present in DoNQ, (for example, count for a package labeled by weight) may be more useful to a consumer if it is located closer to the DoNQ since the consumer will look for and benefit from having all the net quantity-related information in one general area of the product label. Mixing fonts and using icons as part of the added expression can be effective ways to help facilitate conveying additional information in a manner that is clearly separate from the DoNQ. In the end, the manufacturer electing to provide additional information is responsible for ensuring the combination of the expression content and detail, size, location, font, and contrast provide information in addition to the DoNQ for the typical consumer. When a comparative statement is planned, the manufacturer needs to determine where and how this information is best provided for the benefit of the consumer. Since comparisons can have multiple words, which may differ in font and contrast, a manufacturer must fully consider the location and font of each individual word/term of the expression as well as the overall statement in total in to assess how this might affect the information present in the required DoNQ . Examples that help illustrate recommended practices for voluntarily added quantity expressions are provided in Appendix 2.
6. Expression information must be relevant to the consumer purchasing or using the product. <i>Are the conditions of use well defined and do the statements reflect real-life usage expectations?</i> (Applies to all categories) Important for derived unit statements and comparative statements based on derived units	Voluntary expressions should provide information that a consumer purchasing the product is likely to want or need to know prior to purchase. Similarly, the voluntarily added information provided should reasonably relate to how a normal user would use the product. Statements about reconstitution can help educate consumers about product quantity, especially when similar products are present in different product forms such as ready-to-use liquids, liquid concentrates, and solids. For example, an expression containing information about the amount of product a consumer can expect when package contents are reconstituted should relate to the purpose of that product. Knowing the contents of a package reliably prepares 5 gallons or 10 gallons of drink can be useful when a consumer is planning to provide beverages for a large group or has a dispenser with a 5-gallon capacity. Similarly, an expression providing information in terms of a recognizable derived unit is more helpful and relevant to a consumer when the product is used in a regular and consistent manner by most users. For example, providing health or medicinal information based on “uses” or “doses” can be useful to consumers as they consider how long they might need to want to use the product. Similarly, providing laundry product information based on “loads” can be useful in helping consumers relate to varying degrees of product concentration, especially when a dosing cup is provided to reinforce the quantity expression. Generally, a derived unit expression should have a logical or research-based rationale for why this information is useful to consumers. On the other hand, statements such as “Makes 60 Waffles” or “Washes 18 Floors” may be less helpful or useful due to variability in factors associated with making waffles such as ingredients, equipment, and actual size, or with the size of rooms in a house, variation in product concentration, differences in expected performance. In these instances, the relevance of the declaration seems less uniform, and the specificity of the expression is less likely to apply broadly to a large subset of consumers.

Principle and Scope	Detailed Guidance
7. Expressions should not conflict with units of Legal Metrology <i>Is the expression consistent with units of Legal Metrology?</i> <i>Is the expression exaggerating or minimizing a unit of measure?</i> <i>Does the expression have the potential to create confusion?</i> (Applies to Derived Unit Expressions (DUE's), Comparative Quantity Representations (CQR's) and Comparative Performance Representations (CPR's))	Voluntary expressions that provide quantity-related information in terms of derived units should ensure the expressions do not conflict with or redefine a unit of legal metrology. Units of legal metrology such as ounce, pound, ton, pint, quart, cup, liter, foot, inch, yard, bushel, etc., have precise definitions, and incorporating these terms into the definition of a derived unit requires careful consideration to ensure the derived unit is clear and non-misleading. Voluntary expressions should avoid practices that could create confusion regarding existing units of measure. For example, federal Law prohibits any term qualifying a unit of weight, measure, or count that tends to exaggerate the amount of product in a container, such as “jumbo quart” or “full gallon”. In addition to complying with this requirement, manufacturers should also avoid other practices that may create confusion regarding existing units of measure, such as using a “10-inch foot”. Statements of this type provide no added value to consumers and can be viewed as misleading.
8. Expressions containing reconstituted product information must provide directions for reconstitution on the product label. If an expression states how much product the package can make, the directions for how to prepare the product must be provided on the label. (Applies to REQ's)	When a Reconstituted Expression of Quantity (REQ) is present on the Principal Display Panel (PDP), the manufacturer also must provide information on the package label clearly detailing how the product is recommended to be reconstituted for consumer inspection prior to product purchase. Consumers should be able to tell what other products, ingredients, or equipment will be needed to prepare the product for use. A consumer should be able to readily view and accurately understand the directions to reconstitute the product prior to making a purchase decision. The information detailing the reconstitution directions should be located on the outer package (not on the bottom of the package) for consumer inspection prior to product purchase. The location, size and appearance of this accompanying information should be sized appropriately to ensure a consumer can readily find this information either before purchase or during use. A package can provide reconstitution details for how to prepare the entire package contents or a portion of the contents. For example, when a product states “Makes 64 quarts”, providing consumers with directions for making 2 quarts is encouraged since it is more practical for most consumers not to make all 64 quarts at one time in one container.
9. Expressions containing Derived Units must provide a definition of that unit on the package label. If an expression conveys a quantity in terms of a Unit that is not defined in Legal Metrology, the Unit must be adequately	A consumer should be able to readily view and accurately understand a derived unit statement prior to making a purchase decision. Since a derived unit is not a recognized unit of Legal Metrology, information that defines, and, if necessary, explains the derived unit to ensure consumer understanding should be provided. The information defining and explaining the derived unit should be located on the outer package (not on the bottom of the package) for consumer inspection prior to product purchase. The location, size, and appearance of this accompanying information should be consistent with the required regulatory language, such as the required product responsible party statement. Consistent with such requirements, the information must be legible and may be placed on the side or back panels of the package. It may have a

Principle and Scope	Detailed Guidance
defined on the label. information (Applies to Derived Unit Expressions (DUE's), Comparative Quantity Representations (CQR's) and Comparative Performance Representations (CPR's))	font smaller than that required for the Declaration of Net Quantity (DoNQ), which is often larger than other required text.
10. Expressions that employ the same Derived Unit term must use the same definition for the Derived Unit. The definition for that Derived Unit must be consistent across similar products using consistent terms amongst similar products. <i>Is the statement based on a consistent metric and meaning within a product category?</i> Important for derived unit statements and comparative statements based on derived units (Applies to Derived Unit Expressions (DUE's), Comparative Quantity Representations (CQR's) and Comparative Performance Representations (CPR's))	For statements that are not based on “units” of Legal Metrology, consumers need confidence that expressions appearing on similar and competing product packages can be applied consistently to facilitate value comparisons. Inconsistent definitions for the same “derived unit” or the use of different “derived units” by products in the same product category have the potential to confuse or mislead consumers. Manufacturers using expressions containing derived units are responsible for ensuring that they help consumers and aid in value comparison and purchase decisions. When different definitions are used for similar products, individual companies and trade groups must work together to develop and implement consistent definitions. For example, if competing laundry detergent packages declare the number of “loads”, consumers can rely on this declaration only if the term “loads” is defined in a common way, even if one product is a liquid, a second is a liquid concentrate, and a third is a powder. The uniform, common definition can be defined based on common product attributes--such as a delivered concentration or a degree or recognized performance, a defined quantity of product, or another consumer-related parameter. The key attributes of a derived unit that they must be objective, measurable, and verifiable by a third party. Multiple definitions of a derived unit between similar products or competing products neutralize the potential benefit provided by recognizing derived units, and the prevention of multiple definitions should be aggressively enforced and policed within product categories to promote consistency and uniformity. Similarly, the creation of similar-but-different derived units should also be avoided generally. For example, company A should not create an “A-dose”, and company B should not create a “B-dose” to compete against other products bearing the term “dose”. Consumers need confidence that comparative statements are based on consistent terms to facilitate value comparison. Using inconsistent terms in comparative claims has the potential to confuse or mislead consumers.

Principle and Scope	Detailed Guidance
11. Comparative Expressions which contain a reference to a unit of Legal Metrology must be complete and balanced statements and must appear entirely in the upper 70% of the PDP. (Applies to CQRs)	Manufacturer interest in making comparative statements on their packages has increased as new product technologies have been incorporated into products, resulting in better or longer performance, greater product efficiency, more concentrated products, and lighter-weight products. Traditional comparisons based solely on use of product net content declarations may not provide consumers with sufficient information necessary for consumers to make a fully informed decision. Comparative statements are one means by which manufacturers can provide information about new product forms and performance to consumers. They are also a means by which manufacturers can compare their products to competing products. Manufacturers must carefully consider using comparative statements on the Principal Display panel to ensure the message is complete, clear, correct, relevant, and non-misleading. They also need to ensure that consumers do not interpret a CQR (or parts thereof) as the required DoNQ. Comparative Quantity Representations may provide consumers with important information but also have the potential to confuse or mislead consumers about products. These statements can vary in length, word choice, use of icons and pictograms, the quantity(ies) being compared, and can use limitless choices of fonts, colors, and contrasts to emphasize all or certain parts of a comparative statement. A manufacturer must carefully consider how the CQR content, location, font, and contrast will appear in conjunction with the package's required DoNQ to help facilitate consumers ability to make accurate value comparisons. This is specifically true for a CQR since the weight or measure terms appearing in a CQR have the potential to be interpreted as a Declaration of Net Quantity. To help ensure CQRs (or portions of the comparative statement) which contain references to units of Legal Metrology are not misinterpreted as net content information, the following is recommended: 1. A comparative expression comprised of one or more units of Legal Metrology must appear in its entirety in the upper 70% of the PDP or on another panel of the package. It should not appear in total or part in the lower 30% of the PDP. 2. A comparative expression comprised of one of more units of Legal Metrology must be a complete statement with clear and explicit reference to the products that are being compared. For example, "This product provides 40% more product than the 20 ounce size". Just saying "40% more product" is not a complete statement. Use of asterisks and asterisked statements located elsewhere on the label are not recommended as means to provide a complete statement. If a statement appears on the PDP, it must be a complete statement on the PDP.

Principle and Scope	Detailed Guidance
	3. Information gathered on comparative products should use the same testing methodology as that used for the package bearing the CQR, unless it is not technically feasible and an alternate objective test method is used. 4. While a CQR is not required to name another brand, it is the manufacturer's responsibility to ensure the CQR statement is accurate and valid. Although CQR accuracy is often easy to assess since the CQR and DoNQ are both present on the PDP, CQR statements are still required to be accurate and verifiable, should be supported by manufacturer data, and are subject to external evaluation and confirmation. 5. A comparative expression comprised of one or more units of Legal Metrology must provide equal emphasis on the units of measure. For example, "This 46 OZ package provides over 100% more product than our 22 OZ package".  6. While asterisks may be used in conjunction with a CQR, asterisked information should be used to provide a reference for the basis of the expression and not explain what the CQR really means. A CQR needs to be able to stand on its own. 7. To aid in verification, it is critically important that comparative statements be complete and include correct references to the package and the comparative product(s) to which this package is being compared. For example, a CQR should be a complete statement that makes clear the quantity being compared, the product used in comparison and, if the comparison appears unusual, enough context to ensure the statement is reasonably clear. A consumer's first reaction to a CQR should not be, "that statement is unclear or doesn't make sense". 8. When using a CQR, the comparative product should be another product currently marketed in that general marketplace or the previously marketed version to the same or similar product to make the representation relevant to the consumer. Comparing to a product marketed five years ago provides little value for most consumers. Manufacturers are responsible for ensuring comparative expressions are complete and clear.

Principle and Scope	Detailed Guidance
12. Comparative expression which does not contain a reference to recognized units of Legal Metrology must be balanced and complete. Applies to Comparative Performance Representations (CPR's)	Manufacturer interest in making comparative statements on their packages has increased as new product technologies have been incorporated into products, resulting in better or longer performance, greater product efficiency, more concentrated products, and lighter-weight products. Traditional comparisons based solely on use of product net content declarations may not provide consumers with sufficient information necessary for consumers to make a fully informed decision. Comparative statements are one means by which manufacturers can provide information about new product forms and performance to consumers. They are also a means by which manufacturers can compare their products to competing products. Manufacturers must carefully consider using Comparative Performance Representations (CPR's) on the Principal Display (PDP) panel to ensure the message is complete, clear, correct, relevant, and non-misleading. Comparative Performance Representations may provide consumers with important information regarding how well or long a product might perform but also have the potential to confuse or mislead consumers about products. These statements can vary in length, word choice, use of icons and pictograms, the quantity(ies) being compared, and can use limitless choices of fonts, colors, and contrasts to emphasize all or certain parts of a comparative statement. A manufacturer must carefully consider how the CPR content, location, font, and contrast will appear in conjunction with the package's required Declaration of Net Quantity (DoNQ) and other expressions to help facilitate consumers' ability to make accurate value comparisons. To help ensure CPR's are clear and not misinterpreted, the following is recommended: 1. A comparative performance representation must be a complete statement with clear and explicit reference to the products that are being compared. For example, "This new 20-ounce package provides the same number of uses as our old 46-ounce package." or "This 20-ounce concentrate provides 100% more uses over our 20-ounce unconcentrated product". Just saying "100% more uses." is not a complete statement. The use of asterisks and asterisked statements located elsewhere on the label are not recommended as a means to provide a complete statement. If a statement appears on the PDP, it must be a complete statement on the PDP. 2. Information gathered on comparative products should use the same testing methodology as that used for the package bearing the CPR, Information gathered on comparative products should use the same testing methodology as that used for the package bearing the CPR,

Principle and Scope	Detailed Guidance
	3. While a CPR is not required to name another brand, it is the manufacturer's responsibility to ensure the CPR statement is accurate and valid. Although CPR accuracy is often easy to assess since the CPR and DoNQ are both present on the PDP, CPR statements are still required to be accurate and verifiable, should be supported by manufacturer data, and are subject to external evaluation and confirmation. 4. A comparative expression comprised of one or more units must provide equal emphasis on the units of measure. For example, “This 40 Load package provides double the uses as our 20 Load package”. 5. While asterisks may be used in conjunction with a CPR, asterisked information should be used to provide a reference for the basis of the expression and not explain what the CPR really means. A CPR needs to be able to stand on its own. 6. To aid in verification, it is critically important that comparative statements be complete and include correct references to the package and the comparative product(s) to which this package is being compared. For example, a CPR should be a complete statement that makes clear the quantity being compared, the product used in comparison and, if the comparison appears unusual, enough context to ensure the statement is reasonably clear. A consumer’s first reaction to a CPR should not be, “that statement is unclear or doesn’t make sense”. 7. When using a CPR, the comparative product should be another product currently marketed in that general marketplace or the previously marketed version to the same or similar product to make the representation relevant to the consumer. Comparing to a product marketed five years ago provides little value for most consumers.

Enforcement

Voluntarily added quantity-related expressions are distinct from the Declaration of Net Quantity (DoNQ) and therefore require a different enforcement strategy. The DoNQ is mandatory and is enforced using practices developed over many decades and set out in extensive detail in applicable laws, regulations, and guidance. In contrast, as a type of voluntary label claim, voluntary statements are enforced in the same way as other voluntary claims.

Importantly, voluntary statements are subject to a wide range of legal and regulatory requirements. Some of these requirements are general in nature, and some are specific to net contents. An example of a general requirement is the FDA's prohibition of false or misleading statements of any kind on food labels. Specific prohibitions are set out in many state laws and regulations, such as laws that prohibit misrepresentations relating to quantity. For example, Florida law provides that "no person shall sell or offer or exposure for sale less than the quantity he or she represents." Wisconsin law prohibits representations "in any manner a false quantity or price in connection with the purchase or sale, or any advertising thereof, of any commodity, thing or service."

These and other requirements for voluntary statements are legal obligations and companies must be prepared to demonstrate compliance as necessary. Enforcement practices that are selected will depend on the situation and may include a range of tactics:

- Informal inquiries (e.g., questions during inspections or via a phone call)
 - Written requests to demonstrate compliance (e.g., letters sent to the attention of a company's executives or legal/regulatory departments), which may be initiated by either regulators or by industry in the event of a potential competitive dispute.
 - Written warnings from a regulatory agency that a particular product label is false, misleading, or otherwise violative of a specific requirement.
- Negotiations to resolve labeling concerns, such as a regulatory agency seeking a consent decree or a company asking the National Advertising Division (NAD) to resolve a competitive dispute.
- Formal legal challenges, such as product seizures or stop-sale orders, where the relevant requirements for such actions are met.

These guidelines are intended to aid in all such compliance efforts as appropriate. For example:

- A regulatory agency may provide the guidelines as a resource to help educate a company about legal requirements and best practices for clear and non-misleading statements.
- A company may provide the guidelines to a competitor that is making what is believed to be an unsupported or misleading claim, to help emphasize the seriousness of quantity-related statements.
- The guidelines may help define the issues that need to be addressed in a legal negotiation or proceeding.

Due to the inherent nature and diversity of voluntary statements, the guidelines' specific use will be case-specific.

Appendix 1

Supplemental Statements

There has been discussion regarding when, where or how added quantity-related information can appear on a package label. The required Declaration of Net Quantity (DoNQ) statement is specific to its content and location in the Fair Packaging and Labeling Act (FPLA) and in specific product regulations. Conversely, FPLA and federal agency regulations speak minimally and vaguely to the subject of adding other accurate information to the product label.

This Appendix summarizes the legal/regulatory history regarding use of “supplemental statements” which are mentioned in FPLA, and in agency regulations (such as those promulgated by the Federal Trade Commission (FTC) and the Food and Drug Administration (FDA)).

Fair Packaging and Labeling Act (FPLA)

The supplemental statement requirement comes from FPLA Section 4(b):

“Requirements of labeling; placement, form, and contents of statement of quantity; supplemental statement of quantity

(b) Supplemental statements

No person ... shall distribute ... any packaged consumer commodity if any qualifying words or phrases appear in conjunction with the separate statement of the net quantity of contents required by subsection (a), but nothing ... shall prohibit supplemental statements, at other places on the package, describing in nondeceptive terms the net quantity of contents: *Provided*, That such supplemental statements of net quantity of contents shall not include any term qualifying a unit of weight or mass, measure, or count that tends to exaggerate the amount of the commodity contained in the package.” (15 U.S.C. 1453)

There are three parts to this information from FPLA:

1. No mandatory language is specified for the supplemental statement.
2. Supplemental statements are allowed “at other places”.
3. Terms that exaggerate an amount (the net quantity) are not allowed.

What is a Supplemental Statement?

There is no official definition in the FPLA or regulations promulgated by the Federal Trade Commission (FTC) and the Food and Drug Administration (FDA). U.S. congressional legislative history has provided this example: “6 oz. of fast acting X detergent”, and in the following, Congress has said this is a “supplemental statement” that can be “apart from the required net quantity statement”:

“Subsection 4(b) prohibits the qualification of the separate quantity statement by any modifying words or phrases. However, a supplemental statement of the net quantity of contents set apart from the separate net quantity statement, required by the bill, may be modified by nondeceptive words or phrases, so long as such words or phrases do not tend to exaggerate the amount of the commodity contained in the package. For example, where a package contains a separate net quantity statement in conformity with promulgated regulations, such as ‘6 oz. net weight,’ the package could also contain in a supplemental statement, apart from the required net quantity statement, the phrase ‘6 oz. of fast acting X detergent’ but could not contain the statement ‘6 jumbo oz. of X detergent’ at any place on the package.” (Senate Report 1186 at 5-6)

Food and Drug Administration (FDA)

The FDA administers the FPLA with respect to foods, drugs, cosmetics and medical devices. Pursuant to their authority under FPLA, FDA has issued food labeling regulations under Title 21, Chapter 1, Subchapter B in the Code of Federal Regulations. 21 CFR §101.7(o) states:

“Nothing in this section shall prohibit supplemental statements at locations other than the principal display panel(s) describing in nondeceptive terms the net quantity of contents; *Provided*, that such supplemental statements of net quantity of contents shall not include any term qualifying a unit of weight, measure, or count that tends to exaggerate the amount of the food contained in the package; for example, ‘jumbo quart’ and ‘full gallon’.”

What this means is that the Declaration of Net Quantity may not contain statements designed to imply that one product is different in quantity from other products that declare the same net contents. What this also means is that Congress wanted the required declaration to be separate from supplemental statements designed to promote product sales. 21 CFR §101.7(o) ensures that such separation exists by permitting supplementary net quantity statements on label panels other than the Principal Display Panel (PDP). However, there is no indication in Senate Report No. 1186, or elsewhere in the legislative history of the FPLA that congressional concern about a "supplementary statement" was intended to encompass other forms of non-misleading information about the quantity of contents other than the one required. To the contrary, the broad congressional policy in Section 2 of the FPLA states:

"Packages and labels should enable consumers to obtain accurate information as to the quantity of the contents and should facilitate value comparisons". (15 U.S.C. 1451)

Note: Declaration of a statement of net quantity of contents in terms of both drained weight and net weight would not be inconsistent with this policy because such declarations advise consumers of the amount of food and the accompanying packing medium, thereby assisting purchasing decisions. [62 Fed. Reg. 9833-34 (Mar. 4, 1997)]

Federal Trade Commission (FTC)

The FTC administers the FPLA with respect to other “consumer commodities” that are expended in the household. Pursuant to their authority under FPLA, FTC has issued labeling regulations under Title 16, Chapter 1, Subchapter E in the Code of Federal Regulations. 16 CFR §500.24 states:

“Supplemental statements.

Nothing contained in the regulations in this part shall prohibit supplemental statements, at locations other than the principal display panel, describing in non-deceptive terms the net quantity of contents ... Required combination declarations of net quantity of contents (for example, a combination of net weight or mass plus numerical count, numerical count plus dimensions of the commodity, etc.) are not regarded as supplemental net quantity statements and shall be located on the principal display panel. Dilution directions or other similar directions for use are not regarded as supplemental net quantity statements and may be located on the principal display panel. Size characterizations in compliance with standards promulgated under section 5(c)(1) of the Act may appear on the principal display panel.”

Uniform Packaging and Labeling Regulation (UPLR)

The Uniform Packaging and Labeling Regulation (UPLR) was adopted by the National Council on Weights and Measures (NCWM) to provide accurate and adequate information on packages as to the identity and quantity of contents so that purchasers can make price and quantity comparisons to parallel regulations adopted by federal agencies under FPLA. Section 6.12 in NIST Handbook 130 states:

“Supplementary Quantity Declarations -

The required quantity declaration may be supplemented by one or more declarations of weight, measure, or count, such declaration appearing other than on a principal display panel.”

FDA Interpretations

In the absence of a definition for supplemental statements, several instances emerged over time which required FDA to declare what is and what is not supplemental. The first instance is an FDA example when the regulation was issued, the remaining are cases where FDA expressed an opinion based on a marketplace circumstance.

- On a commodity requiring a declaration of fluid measure, a weight declaration IS supplemental when it is included as part of the Declaration of Net Quantity Statement.
- On a commodity for which weight or volume is sufficient (e.g., sliced cheese, candy bars at Halloween, where weight is enough), count may be voluntarily added and IS NOT supplemental.
- A voluntary declaration of drained weight IS NOT supplemental when combined with a mandatory declaration of the total package weight, including packing liquids.
- A reconstitution declaration such as “makes 1 quart” IS NOT supplemental.
- Metric labeling WAS NOT supplemental when it was voluntarily provided. Metric labeling is now required for most products.

Metric Labeling

Metric labeling is not considered supplemental:

“(p) A separate statement of the net quantity of contents in terms of the metric system is not regarded as a supplemental statement and an accurate statement of the net quantity of contents in terms of the metric system of weight or measure may also appear on the principal display panel or on other panels.” [32 Federal Register 10729, 10733 (July 21, 1967)]

FTC Interpretations

FTC has similarly provided interpretations of their regulation since it has been issued.

- Required combination Declarations of Net Quantity of contents (e.g., net weight plus count) ARE NOT supplemental (seems to be limited to mandatory and differs from FDA).
- Dilution directions or other similar directions for use ARE NOT supplemental.
- Size characterizations in compliance with standards promulgated under section 5(c)(1) of the Act ARE NOT supplemental.
- Performance claims per letter from Robin Rosen Spector, Attorney, FTC Division of Enforcement, Bureau of Consumer Protection, to Michael Tomenga, Nov. 4, 2010:

“Commission staff believes that the ‘lasts the same as’ statement on the Kingsford charcoal packaging does not qualify the package’s unit of weight. Consumers would likely reasonably interpret that statement as a performance claim about the product. The claim appears as a distinct item on the display panel and is

separated from the net quantity declaration in accordance with the requirements of the FPLA regulations. Therefore, we would not recommend that the Commission bring a law enforcement action for violations of the FPLA based on the facts presented in your letter. Nevertheless, under section 5 of the Federal Trade Commission Act, the company must possess and rely upon reasonable substantiation for the claim and the claim should not be deceptive. See FDC Policy Statements on Deception and Substantiation: <http://www.ftc.gov/bcp/policystmt/ad-decept.htm>; <http://www.ftc.gov/bcp/guides/ad3subst.htm>. “

- Performance claims per letter from James A. Kohm, Associate Director, FTC Division of Enforcement, Bureau of Consumer Protection, to David Sefcik, Nov. 30, 2016:

“All of the quantity-related expressions in the Subcommittee’s draft guidance are descriptive or supplemental quantity information. Therefore, this information can only appear elsewhere on the packaging (anywhere except the principal display panel). See 16 CFR Sections 500.6(b) (‘The declaration of net quantity shall appear...on the principal display panel...and shall not include any term qualifying a unit of weight or mass, measure, or count...’) and 500.24 (‘Nothing contained in the regulations in this part shall prohibit supplemental statements, at locations other than the principal display panel, describing in non-deceptive terms the net quantity of contents...’). Nonetheless, we are unlikely to recommend that the FTC pursue enforcement action for non-deceptive labels. Doing so could deprive consumers of valuable information in some situations.”

Summary

In summary, the term "supplemental statement" which appears in FPLA, FTC and FDA regulations is not defined. Based on the history of opinions and clarifications provided by the federal agencies since adoption of FPLA, it becomes apparent that the definition is not intended to be expansive and somewhat narrow. The FDA on numerous occasions has opined that certain quantity related expressions are NOT supplemental statements and FTC on at least one occasion has similarly opined this viewpoint as well.

While it is not clear what exactly is and is not a supplemental statement, the many circumstances where the agencies have concluded that an expression is NOT a supplemental statement give some insight into allowable and non-allowable expressions. In the most recent FTC opinion suggesting (which was written without a review of the history of previous FDA and FTC recommendations) that the term supplemental statement could be broadly interpreted, FTC goes on to state that added quantity expressions provide useful information to consumers, and they recommend against enforcement actions for packages which display this information. The other opinions provided by FTC and FDA also appear to similarly recognize that the information being provided is useful to consumers.

As a result, this NCWM Best Practice Document has been developed to help ensure that any and all quantity expressions which might appear on a package are clear, non-misleading and useful.

Appendix 2

Illustrations and Discussion of Voluntarily Added Expressions

The purpose of this Appendix is to illustrate package Principal Display Panel (PDP) examples for the purposes of illustrating some of the principles discussed by this document. These examples are intended to be representative and specifically do not cover every possible permutation of possible label scenario since the number of possible scenarios is extremely large.

This appendix is comprised of diagrams focusing on a limited number of label elements. Diagrams were selected as more appropriate than photos of marketed products to avoid possible product identification and the perception of an implicit product endorsement or critique.

This appendix was developed because it is essential that manufacturers consider the cumulative effects of expression location, size, font, color, and contrast on the package in relation to other required and voluntary PDP elements and statements. Expression location, presentation, size and contrast should help the consumer to make informed value comparisons at the point of purchase and not minimize the visibility or content of other information required to appear on the PDP.

A manufacturer is responsible for ensuring an Additional Expression of Quantity (AEQ's) location, font, graphics or wording provides clear and non-misleading information that does not contradict or marginalize the information provided in the required Declaration of Net Quantity (DoNQ)

Additional Expressions of Quantity can appear on the PDP as illustrated in the following examples, which illustrate differences in color, font size, expression wording, and graphic design such as graphic features or icons. An AEQ may employ a single color and font type or may combine 2 or more colors and fonts. AEQs may express information in the same unit as in the DoNQ or other common recognizable units of legal metrology or count appropriate for the type of product and package size.

1. Additional Expression of Quantity (AEQ) – Additional Expressions of Quantity (AEQ) may appear in the upper 70% or lower 30% of the Principal Display Panel (PDP). The AEQ can be located opposite the Declaration of Net Quantity (DoNQ), or adjacent to the DoNQ, provided the Declaration of Net Quantity minimum separation requirements are satisfied.



PREFERRED

This example illustrates the inclusion of an AEQ (½ Liter) near the top of the PDP which is equivalent to an element of the DoNQ. The color and contrast of the ½ Liter expression have been selected to increase the visibility of the AEQ. Both the DoNQ and AEQ are clear and non-misleading.

QUESTIONABLE

This example illustrates the inclusion of an AEQ (½ Liter) near the top of the PDP which is equivalent to an element of the DoNQ, however, the color and contrast of the ½ Liter expression could mitigate the visibility of the AEQ on this package.

PROBLEMATIC

This example illustrates the repetition of the DoNQ statement at a second location on the PDP. The DoNQ has a prescribed location on the PDP and should be provided only at that location. FTC regulations do not support inclusion of the DoNQ at a second location on the PDP. Reinforcing that there is one and only one DoNQ at a specific location on the PDP is good policy for both consumers and manufacturers.



PREFERRED

This example illustrates the inclusion of an AEQ that states $\frac{1}{2}$ Liter near the top of the PDP which is an equivalent expression to 500 mL in the Declaration of Net Quantity (DoNQ).

PROBLEMATIC

This example illustrates the inclusion of the phrase “At Least $\frac{1}{2}$ Liter” near the top of the PDP while the DoNQ states 500 mL. Since the DoNQ states the package contains 500 mL, the AEQ must be an equivalent statement. “At Least $\frac{1}{2}$ Liter” is not an equivalent statement to 500 mL and implies the package may or may not contain more than 500 mL without any added clarification. As a result, this is viewed as problematic.

PROBLEMATIC

This example illustrates inclusion of the expression “Up to $\frac{1}{2}$ Liter!”. This example is problematic since “up to” does not communicate a precise and verifiable quantity to a prospective buyer of an individual package, and may actually contain less. This expression also is not consistent with the DoNQ. Expressions like “up to”, “approximately” and “about” suggest a quantity range instead of a verifiable quantity. Additionally, the $\frac{1}{2}$ may be hard to see as a result of its size and contrast.



PREFERRED

This example illustrates the inclusion of an AEQ (6 Doughnuts) near the top of the PDP which provides package count information in addition to the weight/mass information provided by the DoNQ. The “6” and “Doughnuts” appear with differing font, color and contrast in a manner which makes the AEQ clear.



PREFERRED

This example illustrates the inclusion of an AEQ (6 DOUGHNUTS) in the lower 30% of the PDP on the opposite side of the label and separate from the DoNQ which provides weight/mass information. The “6” and “DOUGHNUTS” appear with the same font, color and contrast in a manner which makes the AEQ clear.



PREFERRED

This example illustrates the inclusion of an AEQ (6 Doughnuts) in the lower 30% of the PDP on the same side by separate from the DoNQ. The “6” and “Doughnuts” have different font sizes and their color differs from the DoNQ, which makes the AEQ ~~clear~~ separate and distinct from the DoNQ.



PROBLEMATIC

This example illustrates the inclusion of an AEQ (6 Doughnuts) in the lower 30% of the PDP immediately adjacent to the DoNQ. In this case, the “6 Doughnuts” is not separate from the DoNQ despite having a different color and font.



PROBLEMATIC

This example illustrates the inclusion of an AEQ (6 Large Doughnuts) in the lower 30% of the PDP which provides package count information in addition to the weight/mass information provided by the DoNQ. The “6” and “Large Doughnuts” appear in differing font sizes and color from the DoNQ, but the AEQ location is almost too close to the DoNQ and the DoNQ separation requirement. The term “Large” in the AEQ is an undefined quantity term which makes the AEQ less objective Terms such as “Large” and “Jumbo” are prohibited from the DoNQ because they can exaggerate quantity, and an AEQ on the PDP should similarly not use exaggerating terms.

2. Reconstituted Expression of Quantity (REQ) – Reconstituted Expressions of Quantity may appear in the upper 70 % or lower 30% of the Principal Display Panel (PDP) as illustrated in the examples below. The REQ may be located opposite the Declaration of Net Quantity (DoNQ), or adjacent to the DoNQ, provided the Declaration of Net Quantity minimum separation requirements are satisfied. Where two or more REQs are present (not shown), they may appear in both the upper 70% and/or lower 30% of the PDP. It is not required for the REQ statements to be identical provided they are both accurate and non-misleading.



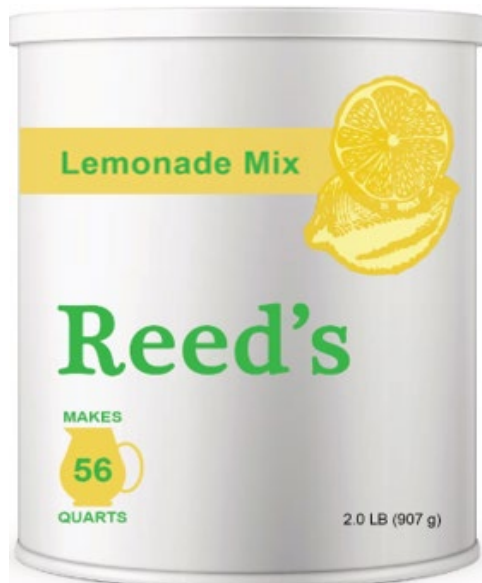
PREFERRED

This example illustrates the inclusion of an REQ (Makes 56 Quarts) in the upper 70% of the PDP which provides information concerning how much product the package contents can make per the package instruction. The REQ includes a pitcher related to how the product is mixed and consumed. The REQ is accurate and separate from the DoNQ.



PROBLEMATIC

This example illustrates the inclusion of an REQ (Makes about 56 Quarts) in the upper 30% of the PDP. The REQ separates itself from the rest of the label including the DoNQ, however, the term ~~but~~ “about” does not communicate a precise and verifiable quantity. Expressions like “up to”, “approximately” and “about” suggest a quantity range instead of a verifiable quantity, and in this example “About 56 Quarts” is problematic because it is inexact and not verifiable, and a consumer may or may not be able to make 56 quarts of reconstituted product.



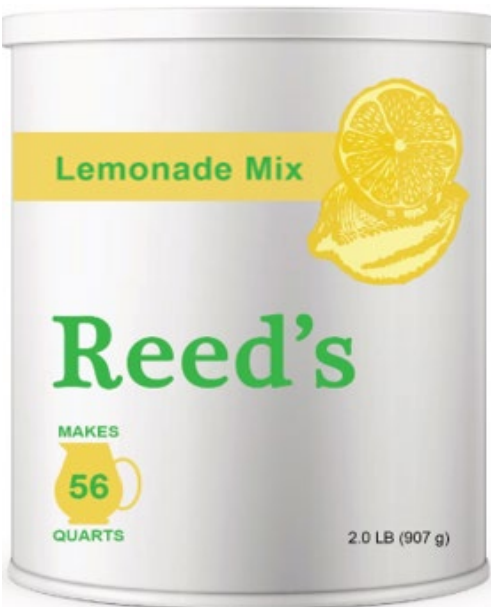
PREFERRED

This example illustrates the inclusion of an REQ (Makes 56 Quarts) in the lower 30% of the PDP on the opposite side from the DoNQ. The REQ provides information concerning how much product the package contents can make per the package instruction. The REQ includes a pitcher related to how the product is mixed and consumed. The REQ is accurate and separate from the DoNQ.



PROBLEMATIC

In this example “56 Quarts” appears with the “2.0 LB 907g” in the DoNQ. While the inference might be that this package makes 56 quarts, the actual package contents is not 56 quarts. Whether the 56 Quarts in this example is immediately adjacent to the DoNQ or separate from the DoNQ, stating 56 Quarts without “Makes” is an incorrect statement.



PREFERRED

In this example, we show the PDP and the product reconstitution instructions from the back of the package label.

This PDP with the REQ follow the principles of this Document. One added requirement for REQs are clear and verifiable reconstitution instructions which must appear someplace on the package label. These instructions provide clear and verifiable directions for reconstituting product.

Reconstituted Instructions *(from package back panel labeling)*

To Mix: Add 2 quarts of water to 1/3 cup of powder.



PROBLEMATIC

In this example, we show the PDP and the product reconstitution instructions from the back of the package label.

This PDP with the REQ follow the principles of this Document. One added requirement for REQs are clear and verifiable reconstitution instructions which must appear someplace on the package label. The instructions provided in this example are not specific, objective or verifiable.

Reconstituted Instructions *(from package back panel labeling)*

To Mix: Add water to mix to taste.

3. Derived Unit Expression (DUE) – A manufacturer is responsible for ensuring a Derived Unit Expression (DUE’s) location, font, graphics or wording provides clear and non-misleading information which does not contradict or marginalize the information provided in the required Declaration of Net Quantity (DoNQ).

Derived Unit Expressions can appear in the upper 70% or lower 30% of the Principal Display Panel (PDP) as illustrated in the following examples which illustrate differences in color, font size, expression wording, and graphic design such as graphic features or icons. Icons are used commonly for this type of expression. A DUE may employ a single color and font type or may combine 2 or more colors and fonts. Where two or more DUEs are present (not shown), they may appear in both the upper 70% and/or lower 30% of the PDP. It is not required for the DUE statements to be identical provided they are both accurate and non-misleading.



This example illustrates the inclusion of a DUE (28 DOSES) in the lower 30% of the PDP which provides information concerning how many derived units the package contents can make per the package instruction. The DUE is accurate, verifiable and separate from the DoNQ.

This example includes the PDP and a statement from elsewhere on the package label. In this case, the PDP shows the inclusion of a DUE (20 LOADS) in the upper 70% of the PDP which provides information concerning how many derived units (LOADS) the package contents can deliver. The PDP of this package adheres to the principles for DUEs contained in this Document.

One requirement for DUEs is that there must be a derived unit definition (which is clear and verifiable) someplace else on the package labeling. See examples below.

PREFERRED

In this example, the derived unit is defined to be 8 fluid ounces of detergent. This is clear and verifiable.

ONE LOAD IS 1 CUP (8 FL OZ)
WHICH IS THE AMOUNT OF
DETERGENT TO DO A MEDIUM
LOAD

PROBLEMATIC

In this example, the derived unit is not clearly defined and is not verifiable.

USE APPROXIMATELY ONE CUP OF
DETERGENT FOR YOUR LAUNDRY
LOAD



PROBLEMATIC

In this diagram, the derived unit expression appears with minimal separation from the DoNQ in the lower 30% of PDP. With this spacing the “20 Loads” appears to be part of the DoNQ, which is in violation of DoNQ requirements since Loads (and other Derived Units) are not units of Legal Metrology. As a result, separation of a DUE from the DoNQ must be sufficiently large to ensure that the DUE is clearly not part of the DoNQ.



PROBLEMATIC

In this diagram, the DUE statement “Makes Up to 20 Loads” is an inexact expression that does not provide accurate quantity information that consumers can rely upon and regulators can verify. Exactly how many Loads are delivered? Expressions appearing on the PDP need to provide precise and accurate values, not ranges.

4. Comparative Quantity Representation (CQR) – A manufacturer is responsible for ensuring a Comparative Quantity Representation (CQR's) location, font, graphics or wording provides clear and non-misleading information which does not contradict or marginalize the information provided in the required Declaration of Net Quantity (DoNQ). Because CQRs may employ the same units as those contained in the DoNQ, manufacturers should carefully consider the CQR expression content, location, graphics and fonts to minimize the likelihood that a portion of the CQR is misinterpreted to be the DoNQ.

Comparative Quantity Representations should appear in the upper 70% of the Principal Display Panel (PDP) as illustrated in the following examples which illustrate differences in color, font size, expression wording, and graphic designs. A CQR may employ a single color and font type or may combine 2 or more colors and fonts. CQR's may express information in the same unit as in the DoNQ or other common recognizable units of legal metrology or count appropriate for the type of product and package size.



QUESTIONABLE

The CQR on this package is questionable because the expression is very close to extending into the lower 30% of the PDP. Because CQRs are full statements which have numbers which can be over emphasized, the statements in their entirety need to remain outside the lower 30% of the PDP to ensure separation from the DoNQ.



PROBLEMATIC

The CQR on this package covers the entire right side of the PDP. The expression extends into the lower 30% of the PDP where the 15 LB portion of the expression appears in a larger font with a bolder color. This presentation can be misinterpreted by a consumer shopping in a retail establishment as being a 15 LB package, not the 8 LB package it really is. While CQRs can make words and numbers of differing sizes, colors, and fonts, these statements are to remain outside the lower 30% of the PDP to avoid potential confusion.



PREFERRED

The CQR on this package label provides a comparison between this package and another package which is clearly defined. Its location is outside the lower 30% in its entirety and clearly separate from the DoNQ



PROBLEMATIC

The CQR on this package is problematic because the expression is clearly within the lower 30% of the PDP. Because CQRs are full statements which have numbers which can be over emphasized, the statements in their entirety need to remain outside the lower 30% of the PDP to ensure separation from the DoNQ.

5. Comparative Performance Representation (CPR) – A manufacturer is responsible for ensuring a Comparative Performance Representation (CPR's) location, font, graphics or wording provides clear and non-misleading information which does not contradict or marginalize the information provided in the required Declaration of Net Quantity (DoNQ).

Comparative Performance Representations can appear in the upper 70% or lower 30% of the Principal Display Panel (PDP) as illustrated in the following examples which illustrate differences in color, font size, expression wording, and graphic design. A CPR may employ a single color and font type or may combine 2 or more colors and fonts.



PREFERRED

The CPR on this package is an expression which clearly compares the number of Loads delivered between 2 specific packages. The statement is clearly separate from the DoNQ.



PROBLEMATIC

The CPR on this package is a general statement comparing this package to powdered detergents without clear comparison to any specific package. While located separate from the DoNQ, a CPR needs to provide specific and comparisons which can be used by consumers and verified by regulators.

Resources

Federal Trade Commission Act (15 U.S.C. § 45)

<https://www.ftc.gov/legal-library/browse/statutes/federal-trade-commission-act>

<https://www.ftc.govhttp://uscode.house.gov/view.xhtml>

Fair Packaging and Labeling Act

<https://www.ftc.gov/enforcement/rules/rulemaking-regulatory-reformproceedings/fair-packaging-labeling-act-regulations-0>

NIST Handbook 130 Uniform Laws and Regulations *(includes Uniform Weights and Measures Law, Uniform Packaging and Labeling Regulation, Uniform E-Commerce Regulation)*

<https://www.nist.gov/pml/weights-andmeasures/publications/nist-handbooks/handbook-130-current-edition>

FDA Food Labeling Guide

<https://www.fda.gov/foodlabelingguide>

FDA Updated Nutrition Labeling Examples

<https://www.fda.gov/media/99151/download>

FDA Cosmetic Labeling Regulations

<https://www.fda.gov/cosmetics/cosmetics-labeling-regulations/codefederal-regulations-sections-cosmetics-labeling-cfr-title-21-part-701>

FDA Cosmetic Labeling Guide

<https://www.fda.gov/cosmetics/cosmetics-labeling-regulations/cosmetics-labeling-guide>

Specifications and Tolerances (S&T) Committee

2026 Annual Meeting Agenda

Mark Lovisa, Committee Chair
Louisiana

INTRODUCTION

This is the agenda of the Specifications and Tolerances Committee (hereinafter referred to as the “Committee”) for the 111th Annual Meeting of the National Council on Weights and Measures (NCWM). This report is based on the Interim Report offered in the NCWM Publication 16, testimony heard at public hearings, comments received from the regional weights and measures associations and other parties, the addendum sheets issued at the Annual Meeting, and actions taken by the membership at the voting session of the Annual Meeting. The Informational items presented below were adopted as presented when the Board’s report was approved.

Table A identifies the agenda and appendix items. Agenda items are identified in the Report by Reference Key Number, Item Title, and Page Number. Item numbers are those assigned in the Interim Meeting agenda. A Voting item is indicated with a “V” after the item number. An item marked with an “I” after the reference key number is an Informational item. An item marked with a “D” after the reference key number is a Developing item. The developing designation indicates an item has merit; however, the item was returned to the submitter for further development before any action can be taken at the national level. An agenda “Item Under Consideration” is a statement of proposal and not necessarily a recommendation of the BOD. Suggested revisions are shown in **bold face print** by ~~striking out~~ information to be deleted and underlining information to be added. Table B lists the results of any Voting Items.

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.

Some Voting Items are considered individually; others may be grouped in a consent calendar. Consent calendar items are Voting Items that the Board has assembled as a single Voting Item during their deliberation after the Open Hearings, assuming that the items are without opposition and will not require discussion. The Voting Items that have been grouped into consent calendar items will be listed on the addendum sheets. Prior to adoption of the consent calendar, the Board will remove specific items from the consent calendar upon request to be discussed and voted upon individually.

The Board may change the status designation of agenda items (Developing, Informational, Assigned, Voting and Withdrawn) up until the report is adopted, except those items which are marked Developing, Informational, Assigned or Withdrawn cannot be changed to Voting Status. Any change from the Board Interim Report (as contained in this publication) or from what appears on the addendum sheets will be explained to the attendees prior to a motion and will be acted upon by the active members of NCWM prior to calling for the vote.

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, presentation and data may have been submitted for consideration with this item. Please refer to <https://www.ncwm.com/publication-16> to review these documents.

All sessions are open to registered meeting attendees. 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) the Chairman or, in his 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 desk. If possible, the posting will be made at least a day before the planned closed session.

Subject Series List

Handbook 44 – General Code	GEN Series
Scales	SCL Series
Belt-Conveyor Scale Systems	BCS Series
Automatic Bulk Weighing Systems	ABW Series
Weights	WTS Series
Automatic Weighing Systems	AWS Series
Weigh-In-Motion Systems used for Vehicle Enforcement Screening	WIM Series
Liquid-Measuring Devices	LMD Series
Vehicle-Tank Meters	VTM Series
Liquefied Petroleum Gas and Anhydrous Ammonia Liquid-Measuring Devices	LPG Series
Hydrocarbon Gas Vapor-Measuring Devices	HGV Series
Cryogenic Liquid-Measuring Devices	CLM Series
Milk Meters	MLK Series
Water Meters	WTR Series
Mass Flow Meters	MFM Series
Carbon Dioxide Liquid-Measuring Devices	CDL Series
Hydrogen Gas-Metering Devices	HGM Series
Electric Vehicle Refueling Systems	EVF Series
Non-Utility Electricity-Measuring Systems	EMS Series
Vehicle Tanks Used as Measures	VTU Series
Liquid Measures	LQM Series
Farm Milk Tanks	FMT Series
Measure-Containers	MRC Series
Graduates	GDT Series
Dry Measures	DRY Series
Berry Baskets and Boxes	BBB Series
Fabric-Measuring Devices	FAB Series
Wire-and Cordage-Measuring Devices	WAC Series
Linear Measures	LIN Series
Odometers	ODO Series
Taximeters	TXI Series
Timing Devices	TIM Series
Grain Moisture Meters (a)	GMA Series
Grain Moisture Meters (b)	GMB Series
Near-Infrared Grain Analyzers	NIR Series
Multiple Dimension Measuring Devices	MDM Series
Electronic Livestock, Meat, and Poultry Evaluation Systems and/or Devices	LVS Series
Transportation Network Measuring Systems	TNS Series
Other Items	OTH Series

Table A
Table of Contents

Reference Key	Title of Item	S&T Page
GEN – GENERAL CODE.....		152
GEN-25.1	W G-S.5.6. Recorded Representations.....	152
GEN-26.1	V G-S.5.6. Recorded Representations and Appendix D – Definitions: electronic receipt.	154
SCL – SCALES		157
SCL-24.2	D Multiple Sections Regarding Tare.....	157
SCL-22.2	A UR.3.1.X. Required Minimum for Cannabis Products.....	167
SCL-25.1	V S.5.2., S.6., and UR.3.1.	170
SCL-25.3	W UR.3.15. Zero-Balance Recorded Weight for Forklift Scales.....	173
LMD – LIQUID MEASURING DEVICES		176
LMD-24.2	V N.4.1. Normal Tests.	176
LMD-26.1	A 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.	179
HGV – HYDROCARBON GAS VAPOR-MEASURING DEVICES		197
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.....	197
WTR – WATER METERS CODE.....		203
WTR-26.2	V S.1.1.4. Advancement of Indicating and Recording Elements.	203
EVF – ELECTRIC VEHICLE FUELING SYSTEMS.....		205
EVF-26.2	A 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.....	205
FMT – FARM MILK TANKS.....		216
FMT-26.1	V S.1.4. General.....	216
FMT-25.1	V UR.1. Installation	219
TIM – TIMING DEVICES		221
TIM-26.1	V S.1.1.3. Value of Smallest Division	221
MDM – MULTIPLE DIMENSION MEASURING DEVICES		224
MDM-25.1	V Multiple Sections Regarding Adding Volumetric Measuring Devices to Section 5.58.	224
MDM-26.1	V S.1.5.2. Devices Capable of Measuring Irregularly Shaped Objects.....	234
OTH – OTHER ITEMS		236
OTH-25.1	A 2.26 Weigh-in-Motion Systems Used for Vehicle Direct Enforcement.....	236
OTH-26.1	V Appendix D Definitions – interference test.....	254
OTH-26.2	V Appendix D Definitions – scale division, value of (d).....	257
ITEM BLOCK 1 (B1) – TRANSPORTATION-FOR-HIRE SYSTEMS		259
B1-TNS-25.1	I Section 5.60. Transportation Network Measurement Systems – Tentative Code	259
B1-TXI-25.1	I 5.54 Taximeters Transportation-For-Hire Systems.....	267
ITEM BLOCK 2 (B2) – REFERENCES TO TYPE EVALUATION		284
B2: CDL-26.1	V A.4. Type Evaluation.	284

B2: HGM-26.1	V	A.4. Type Evaluation.	285
B2: EVF-26.1	V	A.4. Type Evaluation.	286
B2: EMS-26.1	V	A.4. Type Evaluation.	287
B2: GMA-26.1	V	A.3. Type Evaluation.	288
ITEM BLOCK 3 (B3) – METHOD OF SEALING, CATEGORY 3.....			290
B3: SCL-26.1	V	Table S.1.11. Categories of Device and Methods of Sealing	291
B3: BCS-26.1	V	Table S.2.6. Categories of Device and Methods of Sealing	292
B3: AWS-26.1	V	Table S.1.3. Categories of Device and Methods of Sealing	293
B3: LMD-26.2	V	Table S.2.2. Categories of Device and Methods of Sealing	294
B3: VTM-26.1	V	Table S.2.2. Categories of Device and Methods of Sealing	295
B3: LPG-26.1	V	Table S.2.2. Categories of Device and Methods of Sealing	299
B3: CLM-26.1	V	Table S.2.5. Categories of Device and Methods of Sealing	302
B3: MLK-26.1	V	Table S.2.3. Categories of Device and Methods of Sealing	305
B3: WTR-26.1	V	Table S.2.1. Categories of Device and Methods of Sealing	308
B3: MFM-26.1	V	Table S.3.5. Categories of Device and Methods of Sealing	311
B3: CDL-26.2	V	Table S.2.5. Categories of Device and Methods of Sealing	314
B3: HGM-26.2	V	Table S.3.3. Categories of Device and Methods of Sealing	317
B3: EVF-26.3	V	Table S.3.3. Categories of Device and Methods of Sealing	320
B3: EMS-26.2	V	Table S.2.2. Categories of Device and Methods of Sealing	324
B3: MDM-26.2	V	Table S.2.2. Categories of Device and Methods of Sealing	325
ITEM BLOCK 4 (B4) – ELECTRIC VEHICLE FUELING SYSTEMS SUPPLY EQUIPMENT.....			328
OTH-26.3	V	Handbook 44 Main Table of Contents	328
OTH-26.4	V	Section 3 Table of Contents	329
EVF-26.4	V	Section 3.40..... Electric Vehicle Fueling Systems Supply Equipment.....	330
EMS-26.3	V	A. Application.....	330
TIM-26.2	V	S.1.4. Recorded Representations.....	331

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 Manufacturers 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 the risk of fraud associated with other receipt types.

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).

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:

2026 Interim: None

Industry:

2026 Interim: None

Advisory:

2026 Interim: None

Comments Against:

Regulatory:

2026 Interim: None

Industry:

2026 Interim: None

Advisory:

2026 Interim: None

Neutral Comments:

Regulatory:

2026 Interim: None

Industry:

2026 Interim: None

Advisory:

2026 Interim: None

S&T 2026 Annual Meeting Agenda

Item Development:

The committee withdrew this 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-26.1 V G-S.5.6. Recorded Representations and Appendix D – Definitions: electronic receipt.

Item was improperly identified in NCWM Publication 15, January 2026, as GEN-26.5

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

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 Appendix D as follows

recorded representation. – The printed, embossed, electronic, or other representation that is recorded as a quantity, unit price, total price, product identity, or other information required by a weighing or measuring device that the consumer can obtain in a readily accessible, reasonably permanent form, which is unalterable. [1.10, 2.20, 2.21, 2.22, 2.24, 2.25, 3.30, 3.31, 3.32, 3.33, 3.34, 3.35, 3.36, 3.37, 3.38, 3.39, 5.54, 5.55, 5.56(a), 5.56(b), 5.57, 5.58, 5.60]

electronic receipt. – ~~An electronic version of a recorded representation in electronic form—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:

- 2026 Interim: A regulator from California supports this as a Developing item with consideration that the developed term is being placed in the General Code and as such would apply to all device types. They believe that specification and user requirements would be necessary for a QR code to be used to facilitate access to recorded representations. This regulator would also support this as a Voting item if the QR code is removed from the suggested General Code location and the NIST OWM recommended definition change is adopted. In separate comments, this regulator spoke on potential issues such as not being able to scan the QR code, questioning if there is a requirement on how long the code needs to be displayed, and stating that this is different than entering information to receive a receipt.
- 2026 Interim: A regulator from Vermont spoke in support of this item as it will help define what an acceptable method of recorded representation is. This regulator supports the NIST OWM proposed definition change and supports this item as a Voting item.
- 2026 Interim: A regulator from New Jersey spoke in support of the NIST OWM analysis and supports this item as a Voting item.
- 2026 Interim: A regulator from Iowa spoke in support of this item as a Voting item.

Industry:

- 2026 Interim: A representative of NEMA spoke in support of this item as a Voting item.
- 2026 Interim: A representative from Tesla spoke in support of this item as a Voting item and notes that this item brings much needed clarity on the nature of electronic receipts.
- 2026 Interim: A representative from Electrify America spoke in support of this item as it gives clarity to existing ambiguity of the handbook requirements. It was noted that a QR code is not a receipt, but a means to deliver the receipt to a consumer.

- 2026 Interim: A representative from Endress + Hauser Flow USA Inc. echoed comments heard from the MMA and Gilbarco Inc with support to comments heard from the Arkansas regulator. It was stated that this item could reside in the definition section with perpetuity and without much attention. A Developing status was recommended.
- 2026 Interim: A representative from ChargePoint commented that this type of receipt is happening whether we like it or not and that this can continue to be worked while being given a Voting status this cycle.

Advisory:

- 2026 Interim: A representative from NIST OWM supports this as a Developing item and voiced appreciation to the NTEP Committee for the work that has been done to address this issue. NIST OWM also provided a suggested modification to the definition of **recorded representation**. If this modification is accepted, NIST OWM would support this as a voting item.

Comments Against:

Regulatory:

- 2026 Interim: A regulator from Arkansas spoke in opposition to this item and recommended that it remains Developing. The main concern voiced was that having secondary methods of delivering a recorded representation to consumers in the same code and paragraph of the primary method has given industry the impression that the primary method is optional or can be replaced by secondary means. It was conveyed that secondary options are in addition to the primary and that secondary options, if listed, should be in device specific codes. In separate comments, this regulator recommended that this should be placed in device specific codes and not the definitions.
- 2026 Interim: A regulator from Washington spoke in support of comments heard from Arkansas and wants to recognize and emphasize that the default method of receipt delivery should be in printed form.
- 2026 Interim: A regulator from Maryland spoke in agreement with the representatives from Arkansas, California, and the MMA and recommends a Developing status.

Industry:

- 2026 Interim: A representative of MMA spoke in support of this item in principle as a Developing item. It was stated that an exhaustive list should be based on requirements and not a list of technologies of the time.
- 2026 Interim: A representative from Gilbarco Inc. supports the position of the MMA in that this list of recorded representations could be taken as restrictive and that the language could be more generic to allow for different types of technologies.

Advisory:

2026 Interim: None

Neutral Comments:

Regulatory:

2026 Interim: None

Industry:

2026 Interim: None

Advisory:

- 2026 Interim: None

Item Development:

NCWM 2026 Interim: Hearing comments on this item, the Committee has assigned a voting status to the item, incorporated the definition of **recorded representation** as provided by NIST OWM, and removed the electronic form example list from the proposed **electronic receipt** definition.

The Committee noted that the item was incorrectly identified in Publication 15 at the NCWM 2026 Interim Meeting. The item was corrected from GEN-26.5 to GEN-26.1

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.1.1.1. . 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 $\pm \frac{1}{2}$ 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 $\pm 0.25 e$;*

(i) $\pm 0.5 e$ for Class IIIL scales and Class III highway weight enforcement scales with values of $n = 400$ or greater, or

(ii) $\pm 0.25 e$ 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 $\pm 0.25 e$ **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 $\pm 0.25 e$~~ **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 ($\frac{3}{8}$ 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) **$\pm 0.5 e$ for Class IIIL scales and Class III highway weight enforcement scales with values of $n = 400$ or greater, or**

(b) **$\pm 0.25 e$ 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 III highway weight enforcement scales with values of $n = 400$ or greater, the test load shall be applied at a zero/reference value accurate to $\pm 0.5 e$, 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 $\pm 0.25 e$, and the error calculation shall resolve the error to the nearest 0.2 e.**

(Added 202X)

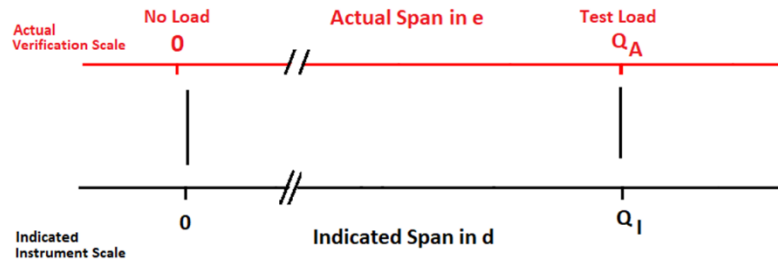
T.N.2.1. General. – The tolerance values ~~are positive (+) and negative (–)~~ herein prescribed shall be applied to errors of overregistration and underregistration, with the weighing device adjusted to zero at no load. When tare is in use, the tolerance values are applied from the tare zero reference (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 III. – 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_1 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.



$$\text{Error of under/overregistration} = Q_I - Q_A$$

$$\text{Error in excess/deficiency} = Q_A - Q_I$$

1

2 The current zero accuracy requirement in S.1.1.1.(b) of $\pm 0.25 e$ was clarified in amendments made 2024. However, the
 3 tolerance structure of class IIIL and IIIL highway weight enforcement scales is very different from the other classes with
 4 many more e's of tolerance (up to 20 for IIIL and up to 10 for IIIL). The 0.25 e accuracy of zero error becomes excessively
 5 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
 6 detection. After the change, any zero indication within ± 10 lb ($\pm 0.5 d$) is sufficiently accurate. More on this subject
 7 follows below. This is reflected in the new test note as well.

8 The $n = 400$ or greater limitation for weight enforcement scales is similar to the 2,000 minimum n for class IIIL.
 9 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
 10 search of NTEP approve weight enforcement scales did not reveal any instruments currently with n values less than 400.
 11 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
 12 class IIIL and highway weight enforcement scales. Note, the accuracy of zero also applies to a strain-load reference value
 13 in a strain-load test which will be a non-zero value.

14 The new paragraph S.1.1.3. is necessary to apply the accuracy of zero requirements equally to analog instruments. This
 15 recognizes that analog zero adjustments may have finite variability.

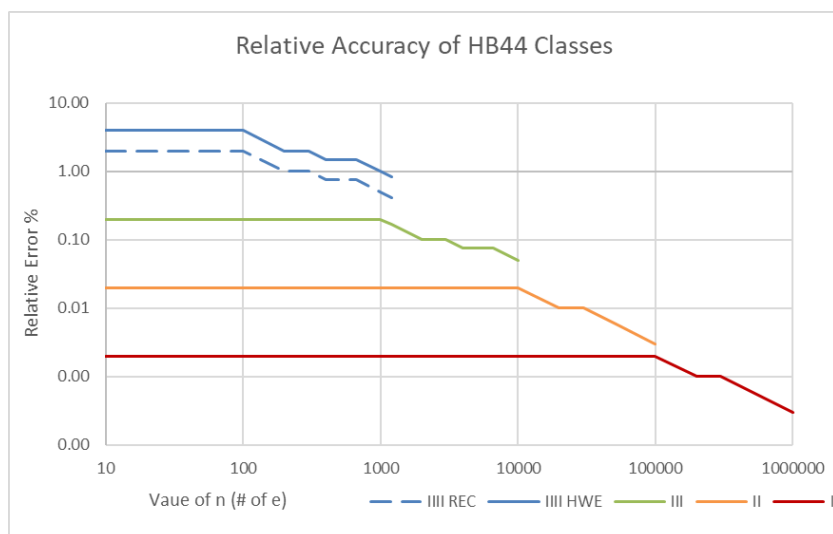
16 The new test note N.1.13. sets both zero accuracy requirements and resolution requirement for testing the scale. More
 17 information of the tolerance structures in the Scales Code and the issue of resolving errors is added below.

18 The changes to T.N.2.1 clarify that tolerances apply to errors of under/overregistration. The current plus or minus could
 19 also be errors in excess/in deficiency. The deleted language is clarified to explain how to conduct the tests to apply the
 20 tolerances to both gross and net indications. The limitation to semi-automatic tare reflects the fact that net zero is not
 21 normally seen at any time in the transaction and that accurate zero to S.1.1.1.(b) cannot be assumed with these tare
 22 methods. Semi-automatic tare must comply with S.1.1.1.(b).

23 Understanding Scales Code Tolerances

24 With the step tolerances in the Scales Code, the increased tolerances with increased test loads give us a false sense that
 25 tolerances increase as test loads increase. Yet the tolerances are actually decreasing when you look at them relatively
 26 rather than absolutely. In addition, we expect weighing instruments to be close to linear in performance. This is why we
 27 test at the maximum load in each tolerance step. The result, as the capacity moves into the second, third, or fourth step,
 28 is decreased probability of failing at lower steps.

29 The relative accuracy of the HB44 weight classes in the Scales Code (other than IIIL) are presented in the graph below.
 30 The scale tolerances based on relative error can be thought of as tolerance at capacity divided by the capacity, or e's of
 31 tolerance divided by n . The basic principle is that more e's generally reflects more accuracy (smaller tolerance) both
 32 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 IIIIL 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 IIIIL 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 IIIIL 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 IIIIL has 20 lb d. In many respects class IIIIL is like having auxiliary indication for class III. Consider the comparison table below for a 200,000 lb scale.

Consideration	III	III	IIIIL
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 IIIIL 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 IIIIL vs III. The doubling of the tolerance along with the n = 400 minimum solved many problems.

Consideration	III	III	III(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 ($Q_1 - Q_A$) 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 or 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 IIIL weight enforcement is to the nearest 1 e. This means error weights are not required 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 – $(1 \text{ e tolerance} + 0.5 \text{ e rounding error}) / 500 \text{ e} * 100 = 0.30 \% \text{ fail threshold}$

@ 150 e load – $(1 \text{ e tolerance} + 0.5 \text{ e rounding error}) / 150 \text{ e} * 100 = 1.0 \% \text{ fail threshold}$

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 – $(1 \text{ e tolerance} + 0.1 \text{ e rounding error}) / 500 \text{ e} * 100 = 0.30 \% \text{ fail threshold}$

@ 150 e load – $(1 \text{ e tolerance} + 0.1 \text{ e rounding error}) / 150 \text{ e} * 100 = 0.73 \% \text{ fail threshold}$

This rounding issue 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)

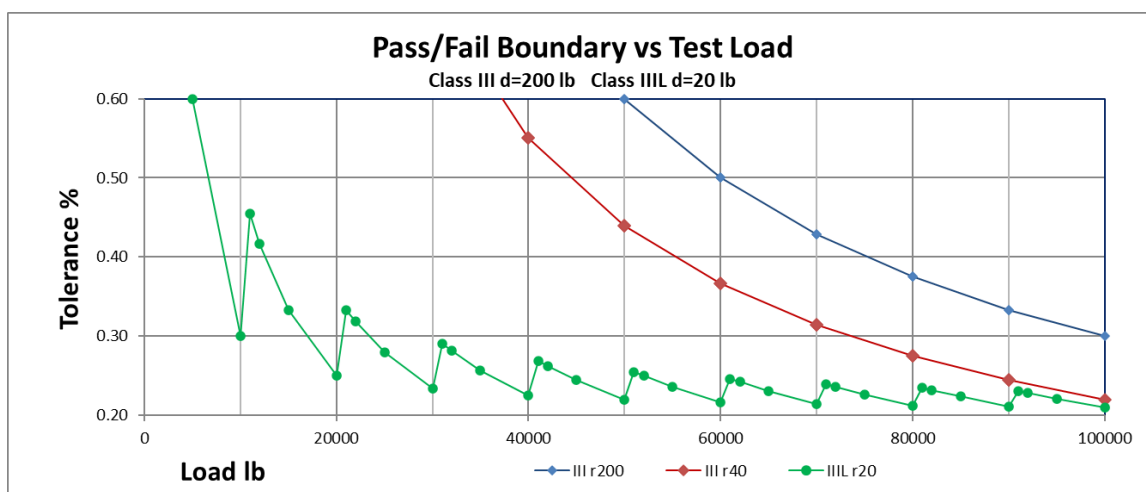
@ 500 e load – $(1 \text{ e tolerance} + 0.5 \text{ e rounding error}) / 500 \text{ e} * 100 = 0.3 \% \text{ fail threshold}$

@ 1,000 e load – $(2 \text{ e tolerance} + 0.5 \text{ e rounding error}) / 1,000 \text{ e} * 100 = 0.25 \% \text{ fail threshold}$

@ 1,500 e load – $(3 \text{ e tolerance} + 0.5 \text{ e rounding error}) / 1,500 \text{ e} * 100 = 0.23 \% \text{ fail threshold}$

@ 2,000 e load – $(4 \text{ e tolerance} + 0.5 \text{ e rounding error}) / 2,000 \text{ e} * 100 = 0.23 \% \text{ fail threshold}$

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.



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 $\text{Gross} - \text{Tare} = \text{Net}$. 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 recorded 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:

2026 Interim: None

Industry:

2026 Interim: None

Advisory:

2026 Interim: None

Comments Against:

Regulatory:

2026 Interim: None

Industry:

2026 Interim: A representative from the Scale Manufacturers Association made comments in opposition to this item and recommended a Withdrawn status due to not being enough confusion to warrant a change.

Advisory:

2026 Interim: None

Neutral Comments:

Regulatory:

2026 Interim: None

Industry:

2026 Interim: None

S&T 2026 Annual Meeting Agenda

Advisory:

2026 Interim: A representative from NIST OWM stated that this item should remain Developing because the submitter has continued to make changes to the item each cycle.

Item Development:

NCWM 2026 Interim Meeting: After hearing comments from the floor, the Committee assigned a Developing status to allow the submitter to further develop the item.

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

During the WWMA 2025 Annual Conference the following comments were received:

Mr. Cory Hainey (Scale Manufacturers 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.

...

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)~~

UR.3.1.X. Required Minimum Loads for Cannabis Products

UR.3.15. Minimum Load for Cannabis Products. - Scales used to weigh Cannabis and Cannabis products that have a total weight of 113 grams (4 ounces) or less shall be Class II and the minimum load shall be 100 e.

[Nonretroactive as of January 1, 20XX]

(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.

S&T 2026 Annual Meeting Agenda

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:

2026 Interim: None

Industry:

2026 Interim: A representative from the Scale Manufacturers Association did not review the newly submitted verbiage for this item but spoke in favor of the item as posted in the agenda as a Voting item.

Advisory:

2026 Interim: None

Comments Against:

Regulatory:

2026 Interim: A regulator from California commented that this item has changed significantly. It was noted that there was a version of this item that was ready for a vote, but not this version.

2026 Interim: A regulator from Delaware commented that this item has been repeatedly pushed back waiting for an update for Table 8. This regulator was in favor of the previous version of this item but is not in favor of the current version of the item. The current version received a recommendation of Developing while the previous version received a recommendation of Voting from this regulator.

Industry:

2026 Interim: None

Advisory:

2026 Interim: None

Neutral Comments:

Regulatory:

2026 Interim: None

Industry:

2026 Interim: A representative from NIST OWM noted that there is a new chair of the Cannabis Task Group and that there is new language for this item that was submitted late in the fall of 2025.

Advisory:

2026 Interim: None

Item Development:

NCWM 2026 Interim Meeting: After receiving comments during open hearings on this item with several concerns regarding the updated language, the Committee assigned it a Developing status.

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 Manufacturers 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.

S&T 2026 Annual Meeting Agenda

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 V 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 <u>Verification Scale</u> ~~Division~~ <u>Interval</u> (~~d or e~~ ^e)	Recommended Minimum Load (d ~~or e~~ ^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~~<u>interval</u> “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.		

1 (Amended 1990 and 20XX)

2 **Previous Action:**

3 2025: Informational

4 **Original Justification:**

5 UR.3.1. and Table 8 were adopted to reduce the error associated with rounding of the scale division (d).

6 Most scales are configured with $e = d$, this proposal has no effect on these devices.

7 Using d to determine the recommended minimum load is technically correct.

8 **Comments in Favor:**

9 **Regulatory:**

10 2026 Interim: A regulator from California commented that this item has merit in that the table being referenced
11 should be based on ‘e’. The recommendation after hearing the presentation is for the item to be
12 Informational.

13 2026 Interim: A regulator from New York voiced support for the item and recommended at least Informational
14 status.

15 **Industry:**

16 2026 Interim: None

17 **Advisory:**

18 2026 Annual: A representative from NIST OWM presented on this item and requested a Voting status.

19 **Comments Against:**

20 **Regulatory:**

21 2026 Interim: None

S&T 2026 Annual Meeting Agenda

Industry:

2026 Interim: None

Advisory:

2026 Interim: None

Neutral Comments:

Regulatory:

2026 Interim: None

Industry:

2026 Interim: A representative from the Scale Manufacturers Association had prepared comments for the item before the presentation was given. Now, after the presentation, the SMA needs more time to formulate an official position.

Advisory:

2026 Interim: None

Item Development:

NCWM 2026 Interim Meeting: After receiving comments on this item during open hearings, the Committee believes this item is fully developed and has assigned a Voting status.

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 Hainey (Representing the Scale Manufacturers 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 W 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 lading 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:

2026 Interim: None

Industry:

2026 Interim: None

Advisory:

2026 Interim: None

Comments Against:

Regulatory:

2026 Interim: None

Industry:

2026 Interim: A representative from the Scale Manufacturers Association commented that S.1.13. and UR.4.1. already require the zero and weight to be accurate or inhibit the weighing operation and that the terms 'recording zero' and 'prior to' in this item are too vague. It was stated that this item is creating a precedent for other onboard weightment systems and potentially all weight transactions to require the recording of zero and weight. The recommendation is Withdrawn for this item.

Advisory:

2026 Interim: None

Neutral Comments:

Regulatory:

2026 Interim: A regulator from California voice similar concerns already addressed by the SMA and NIST OWM representatives and recommended that the submitter of this item work with the Uniform Shipping Law Task Group.

Industry:

2026 Interim: None

Advisory:

2026 Interim: A representative from NIST OWM recommended a Developing status for this item. It was noted that this proposal only addresses one aspect of an accurate weighing process, starting at zero with no load. They also noted that adding a definition of forklift scales to the Handbook is undesirable. It was recommended that the submitter should consider working with the NCWM Uniform Shipment Law Task Group to coordinate their efforts with this group.

Item Development:

NCWM 2026 Interim Meeting: After receiving comments during open hearings, the Committee assigned this item a Withdrawn status.

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 Manufacturers 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:

S&T 2026 Annual Meeting Agenda

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 V 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 tests~~ 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 tests. ~~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:

$$\frac{(\text{MDFR maximum discharge flow rate} + \text{RMDFR rated minimum discharge flow rate})}{2} = \text{minimum discharge flow rate for additional tests}$$

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:

2026 Interim: Regulators from New Jersey and New Hampshire support and recommend voting status.

2026 Interim: A regulator from New York believes the example is not needed but will support it.

Industry:

2026 Interim: None

Advisory:

2026 Interim: A technical advisor from The National Institute of Technology, Office of Weights and Measures believes it is fully developed and recommends voting

2026 Interim: A technical advisor from The National Institute of Technology, Office of Weights and Measures stated there is no example in most recent language just a formula.

Comments Against:

Regulatory:

2026 Interim: None

Industry:

2026 Interim: An associate member from Endress + Hauser Flow USA, Inc believes the written-out example is redundant and recommends developing.

Advisory:

2026 Interim: None

Neutral Comments:

Regulatory:

2026 Interim: A regulator from California believes this issue could have been resolved without the use of the formula. Recommend that other codes should be reviewed for the same addition of the simplified language.

Industry:

2026 Interim: An associate member from Gilbarco believes the item is fully developed and recommends voting status.

Advisory:

2026 Interim: None

Item Development:

NCWM 2026 Interim Meeting: 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. 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:~~

$$\frac{(MDFR_{\text{maximum discharge flow rate}} + RMDFR_{\text{rated minimum discharge flow rate}})}{2}$$

~~= 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 A 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)

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 wholesale device such as a register,

used for blending gasoline and ethanol, 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 (e.g.,
ratio-blending, sequential blending) to create a new product with altered properties
then the device must also be equipped with an electronic automatic temperaturecompensating system.

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 system so that the meter can indicate and record in terms of the
uncorrected volume.

(Added 202X)

...

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)

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 due to blending, normal tests shall be conducted:
(a) by comparing the density corrected volume indicated by the device to the
actual delivered volume corrected to 15 °C (60 °F) using the current version
of ASTM D1250, Standard Guide for the Use of the Joint API and ASTM

1 Adjunct for Temperature and Pressure Volume Correction Factors for

2 Generalized Crude Oils, Refined Products, and Lubricating Oils: API MPMS

3 Chapter 11.1.

4 (b) with the density correction system deactivated, comparing the

5 uncompensated volume indicated or recorded to the actual delivered

6 volume.

7 The first test shall be performed with the automatic density-correction system

8 operating in the “as found” condition.

9 On devices that indicate or record the density-corrected volume, temperaturecompensated volume, and
10 uncompensated volume for each delivery, the tests in

11 N.4.1.1.(a), N.4.1.1.(b), and N.4.1.2., may be performed as a single test.

12 (Added 202X)

13 ...

14 T. Tolerances

15 T.4. Automatic Temperature-Compensating Systems. – The difference between the meter errors

16 (expressed as a percentage) determined with and without the automatic temperaturecompensating system activated
17 shall not exceed:

18 (a) 0.2 % for mechanical automatic temperature-compensating systems; and

19 (b) 0.1 % for electronic automatic temperature-compensating systems.

20 The delivered quantities for each test shall be approximately the same size. The results of each

21 test shall be within the applicable acceptance or maintenance tolerance.

22 [Nonretroactive as of January 1, 1988]

23 (Added 1987) (Amended 1992, 1996, and 2002)

24 T.5. Density Correction Systems. - The difference between the calculated volume of the net

25 final bended product inclusive of growth and the volume calculated using ASTM D1250,

26 Standard Guide for the Use of the Joint API and ASTM Adjunct for Temperature and Pressure

27 Volume Correction Factors for Generalized Crude Oils, Refined Products, and Lubricating

28 Oils: API MPMS Chapter 11.1, shall not exceed 0.1% for nonautomatic or automatic density correction system
29 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.

(Added 202X)

...

UR.3.6. Temperature Compensation and Volume 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) For gasoline-ethanol blends, 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 (1) the additional volume due to density correction for the finished
2 product; and

3 (2) the net volume inclusive of the additional volume due to density
4 correction.

5 Note: Shall include the statement, "Volume delivered has been adjusted to
6 the volume at 15 °C (60 °F) and for changes in density."

7 (Added 202X)

8 UR.3.6.2. Nonautomatic.

9 UR.3.6.2.1. Temperature Determination. – If the volume of the product delivered is
10 adjusted to the volume at 15 °C (60 °F), the product temperature shall be taken during the
11 delivery in:

12 (a) the liquid chamber of the meter; or

13 (b) the meter inlet or discharge line adjacent to the meter; or

14 (c) the compartment of the receiving vehicle at the time it is loaded.

15 UR.3.6.2.2. Density Determination. – If the volume of the product delivered is
16 adjusted for changes in the density of the finished product, then the product density
17 shall be measured, or the product density at base conditions shall be determined in
18 accordance with the current version of ASTM D1250, Standard Guide for the Use of
19 the Joint API and ASTM Adjunct for Temperature and Pressure Volume Correction
20 Factors for Generalized Crude Oils, Refined Products, and Lubricating Oils: API
21 MPMS Chapter 11.1, and applied in the calculation via analysis of each of the base
22 components.

23 (Added 202X)

24 UR.3.6.2.3. Invoices. The accompanying invoice for a nonautomatic density
25 corrected finished product shall indicate that the net volume of the product
26 delivered has been adjusted for temperature variations to a volume at 15 °C (60 °F).
27 Further, for gasoline-ethanol blends, the invoice shall also indicate for each metered
28 component or the finished product:

(1) the API gravity, specific gravity, or coefficient of expansion;

(2) temperature(s);

(3) gross reading;

(4) additional volume due to density correction for the finished

product; and

(5) the net volume inclusive of the additional volume due to density

correction.

Note: Shall include the statement, “Volume delivered has been adjusted to

the volume at 15 °C (60 °F) and for changes in density”.

(Added 202X)

Previous Status:

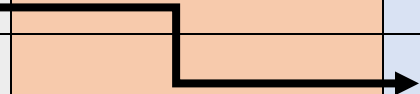
New Proposal

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°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	<i>(output from Temp Comp)</i>	
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.

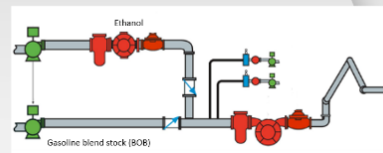
The first configuration is a **Side-Stream terminal**. It measures the ethanol which is then added to the gasoline blend stock ahead of the custody transfer meter. This configuration captures the volume growth that takes place when the net volume of the blended product is calculated.

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.

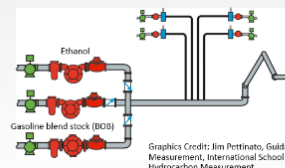
In a Ratio-Blending terminal a calculation can be applied using the process identified in API MPMS Ch. 11.3.4. that corrects for the change in the density of the combined products and the additional volume gain that will occur.

Two Examples of Terminal Blending Configurations

1. Side-Stream
blending with Custody Transfer Meter after the gasoline and ethanol are blended.



2. Ratio Blending
with Custody Transfer Meter on gasoline blendstock and ethanol



Graphics Credit: Jim Pettinato, Guidant Measurement, International School of Hydrocarbon Measurement.



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 60°F or 15°C.

The API gravity is entered into the terminal automation system either manually or through a connected system. The API Gravity, corrected to 60°F 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 °F or use API Table 6B with 50.61 °API.

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/cm³ (999 kg/m³), which is equivalent to 8.337 lb/gal (U.S.). Therefore, for a hydrocarbon or a petroleum fraction, the SG is defined as:

$$SG (60^{\circ}F/60^{\circ}F) = (Density\ of\ liquid\ at\ 60^{\circ}F\ in\ g/cm^3)/(0.999g/cm^3)''$$

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:

$$API = 141.5/(SG_{15.6\ ^{\circ}C}/15.6^{\circ}C) - 131.5$$

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°F or 15°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 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?

³ <https://www.api.org/-/media/files/publications/2024-catalog/2024-publication-catalog.pdf>.

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:

- 2026 Interim: None

Industry:

2026 Interim: An associate member from American Petroleum Institute gave a presentation and handouts and recommends voting.

2026 Interim: An associate member from Guidant Measurement stated that the work was evaluated by independent lab and verified by OIML tests. The reason some data was removed was due to issues found in the process. Says that “estimate” was used in the standard which was a poor choice in words. It is not perfect but better than not accounting for the error.

2026 Interim: An associate member from Chevron aligning with API and Guidant Measurement recommends voting, as he wants everyone to work off the same calculations. Chevron would like to be part of the work group if it is formed.

2026 Interim: An associate member from Marathon states it has already been added to ASTM Standards in 2019 and has gone through a lot of scrutiny. Recommends this for voting.

2026 Interim: An associate member from Exxon Mobil recommends it as a voting item and states we can go to the field and prove it. They see the growth in the terminals and other companies can provide this information.

Advisory:

- 2026 Interim: None

Comments Against:

Regulatory:

2026 Interim: A regulator from Illinois gave a presentation against this item. Opposed to any adoption standard that substitutes modeled estimates for traceable measurements in commercial billing.

2026 Interim: A second regulator from Illinois stated they found this system used in 2019, and this was a hidden charge being applied at the loading rack. Recommends withdrawal.

Industry:

- 2026 Interim: None

Advisory:

- 2026 Interim: None

Neutral Comments:

Regulatory:

2026 Interim: A Regulator from Maryland recommend the item be assigned for additional development and amendments to the proposal to make the intent clear. They would recommend a work group (not FALS) and combining both L&R and S&T items together. Additional testing and data collection with W&M regulatory oversight and by subject matter experts are needed.

2026 Interim: A Regulator from California echoes Maryland and NIST OWM and recommends developing but will not be opposed to assigning it to a work group.

2026 Interim: A Regulator from Kansas echoes Maryland and NIST OWM and would not oppose assigning to a work group.

2026 Interim: A Regulator from Florida echoes comments from California, NTEP, and Maryland. Recommends developing status.

Industry:

2026 Interim: An associate member from Murray Equipment, Inc recommends developing as there is not sufficient real-world data to justify this proposal.

2026 Interim: An associate member from Endress + Hauser Flow USA, Inc. recommends assigned status to a work group so testing can be done with regulatory agency involvement.

Advisory:

2026 Interim: A technical advisor from The National Institute of Standards and Technology recommends developing status due to formatting issues and concerns with how we properly identify the values.

2026 Interim: A technical advisor from National Type Evaluation Program stated that they had no position, but these changes would be viewed as metrological change, and any system would have to come back for recertifications.

2026 Interim: A technical advisor from The National Institute of Standards and Technology asked the industry how regulators can verify the accuracy of the system? An associate member from Exxon Mobile replied that you should be able to blend and measure in a prover. An associate member from American Petroleum Institute also replied that to get to a reference temperature is difficult at the rack the lab has a more controlled environment for the purpose of testing.

Item Development:

NCWM 2026 Interim Meeting: The Committee recommends creating a new task group specifically tasked with developing the 2026 L&R item MOS-26.3 and the 2026 S&T item LMD-26.1. The Committee has removed the nonretroactive requirements.

The Committee formally requests the formation of a joint task group to concurrently develop item LMD-26.1 on the S&T Committee agenda and item MOS-26.3 on the L&R Committee agenda. Both Committees feel these items are dependent upon one another and should be developed in conjunction with one another.

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.

- 1 Mr. Matthew Shein (Chevron): Admits that tolerance could be over the expansion.
- 2 Mr. Steve Benjamin (API Consulting): States expansion happens in transit; expansion cannot occur twice.
- 3 Mr. Matthew Shein (Chevron): Supports Voting status.
- 4 The 2025 WWMA S&T Committee recommends a Voting status. The committee believes this item is fully developed
5 and ready for a vote.
- 6 CWMA 2025 Interim Meeting:
- 7 Prentiss Searles – API, gave a presentation in support of this item.
- 8 Steve Carter – IL, gave a presentation in opposition of this item.
- 9 Steve Carter – IL, recommends withdrawal of this item, commenting that billing should not be based off estimates.
- 10 Andrew Montanye – NE, recommends withdrawal of this item, commenting that this has not been vetted and questions
11 why a meter can't be used to measure the blended product.
- 12 Marcus Belshe – MO, recommends withdrawal of this item, and suggests that a meter be used to measure the blended
13 product.
- 14 Chuck Corr – CC Consulting, states that this is not fully developed nor ready for a vote. Questions the variability of the
15 calculation due to the unpredictability of the blending process, and questions if this could be applied to, and impact, many
16 different products. Suggests that a meter be used to measure the blended product. Written comments were also provided
17 and available on the CWMA site.
- 18 Ivan Hankins – IA, supports further development or withdrawal. Suggests that a meter be used to measure the blended
19 product.
- 20 Greg VanderPlaats – MN, commented that this would not apply in MN, since they do not allow temperature or other
21 compensation. Recommends that some terms being used be defined, such as “reference”, “excess volume”, “net standard
22 volume”, “industry accepted practices”, and “base condition.” Suggests the solution is to use a meter to directly measure
23 the blended product.
- 24 The Committee recommends this item be given a Developing Status based on comments received during open hearing.
- 25 NEWMA 2025 Interim Meeting:
- 26 Representative from API – Gave a presentation on the science and reasons this proposal is warranted. Recommends
27 voting status. Responded to the Representative from NJ that “densimeter” is the best term. The presentation is available
28 on the NEWMA website.
- 29 Representative from NY – Questions whether there should be a UR disallowing Density Corrections for side stream
30 blending since the custody meter already accounts for the volume growth. Recommends developing status.
- 31 Representative from NJ – “Densimeter” should it be that word or not. Should this be defined in Appendix D. In UR.3.6
32 the word “temperature” should be kept when adding “volume” and “correction”. Suggested keeping temperature in the
33 title and adding a separate line requirement for volume correction. Recommends developing status.
- 34 Representative from Marathon Petroleum – Supports this proposal.
- 35 Representative from Growth Energy – No position but has question about implementation for blending and retailers.
- 36 The committee recommends a developing status for this item.

S&T 2026 Annual Meeting Agenda

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.

8 Alison Wilkinson, S&T Committee – Software vs charts . Inquired whether to use the correction factors for density with
9 software or by hand using charts.

10 Russel Lewis, Marathon Petroleum– Answered previous question that it could be both. The working group decided
11 these were the parts of the HB that needed to be addressed (it is also affecting HB130 with L&R)

12 Matt Sheehan, Chevron –in support of Prentiss’ and Russ’ comments. They prefer to use this calculation. In support of
13 this item.

14 Jared Scott, Exxon – in support of this item. Believes this is a way to ensure fair and equitable trade. We want accuracy,
15 both as a consumer and business.

16 Alison Wilkinson, Maryland – Proposal uses existing technology with addition of correction factors – feels this proposal
17 is misleading the way it's currently written. Recommends Developing for further development, for clarification.

18 The committee recommends Developing status on this item.

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

21 **HGV – HYDROCARBON GAS VAPOR-MEASURING DEVICES**

22 **HGV-25.1 D S.1.1.4. Advancement of Indicating and Recording Elements., S.11.5. Proving**
 23 **Indicator., S.2.2. Provision for Sealing., S.4.3. Temperature Compensation.,**
 24 **S.4.4. Badge Identification., N.3. Test Drafts., N.4.1. Normal Tests., and**
 25 **Appendix D. Definitions register**

26 **Source:**

27 California Department of Food and Agriculture – Division of Measurement Standards

28 Purpose:

29 The proposed changes are to recognize new technologies in hydrocarbon gas vapor-measuring devices.

30 Item under Consideration:

31 Amend the Handbook 44 Hydrocarbon Gas Vapor-Measuring Devices Code as follows:

32 **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.**

36 (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:~~

(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.

(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 test circle of the proving indicators 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

<u>Categories of Device</u>	<u>Method of Sealing</u>
<u>Category 1: No remote configuration capability.</u>	<u>Seal by physical seal or two event counters: one for calibration parameters and one for configuration parameters.</u>
<u>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.</u>	<u>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.</u>
<u>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.</u>	<u>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.)</u>

[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)

1 **S.4. Marking Requirements. – In addition to all the marking requirements of Section 1.10. General Code,**
2 **paragraph G-S.1. Identification, each Hydrocarbon Gas Vapor-Measuring Device shall have the following**
3 **information conspicuously, legibly, and permanently marked:**

4 **(Amended 20XX)**

5 **S.4.1. Limitations of Use.** – If a device is intended to measure accurately only products having particular properties, or
6 to measure accurately only under specific installation or operating conditions, or to measure accurately only when used
7 in conjunction with specific accessory equipment, these limitations shall be clearly and permanently stated on the device.

8 **S.4.2. Discharge Rates.** – ~~A device shall be marked to show it's~~ **The** rated gas capacity in cubic meters per hour or
9 cubic feet per hour; **for the particular products that the device was designed to meter as identified by the**
10 **manufacturer.**

11 **(Amended 20XX)**

12 **S.4.3. Temperature Compensation.** – If a device is equipped with an automatic temperature compensator, this shall be
13 **marked on the front of the** ~~indicated on the badge or immediately adjacent to the badge of the~~ device. **If the device**
14 **is equipped with a removable indicating and/or recording element, this information shall also appear** ~~and on the~~
15 **register indicating/recording element.**

16 **(Amended 20XX)**

17 **S.4.4. Badge.** ~~A badge affixed in a prominent position on the front of the device shall show the manufacturer's name,~~
18 ~~serial number and model number of the device, and capacity rate of the device for the particular products that it was~~
19 ~~designed to meter as recommended by the manufacturer.~~

20 ...

21 **N.3. Test Drafts.** – Except for low-flame tests, test drafts shall be at least equal to:

22 **(a) For devices equipped with a mechanical indicating and/or recording elements:**

23 **(1) Meters equipped with test circles** – one complete revolution of the largest capacity proving indicator and shall in no
24 case be less than 0.05 m³ or 2 ft³.

25 **(2) Meters not equipped with test circles** – ten times the smallest **proving indicator** division and shall in no case be
26 **less than 0.05 m³ or 2 ft³.**

27 **(b) For devices equipped with an electronic register** – at least ten times the smallest **proving indicator** division and
28 **in no case less than 0.05 m³ or 2 ft³.**

29 All flow rates shall be controlled by suitable outlet orifices.

30 (Amended 1973, ~~and~~ 1991 **and 20XX**)

31 ...

32 **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~~
33 ~~badge~~ **marked on** of the meter.

34 (Amended 1988, **and 20XX**)

35 ...

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:

2026 Interim: None

Industry:

2026 Interim: None

Advisory:

2026 Interim: A technical advisor from The National Institute of Technology, Office of Weights and Measures supports voting with corrected numbering but also supports the submitter requesting developing.

Comments Against:

Regulatory:

2026 Interim: None

Industry:

2026 Interim: None

Advisory:

2026 Interim: None

Neutral Comments:

Regulatory:

2026 Interim: A regulator from California, the submitter of the item, noted that some formatting issues exist in the current proposal. They recommend developing to correct these errors and receive feedback.

Industry:

2026 Interim: An associate member from National Propane Gas Association supports the item for continued development.

Advisory:

2026 Interim: None

Item Development:

NCWM 2026 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.

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 V 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:

- 2026 Interim: Regulators from California and Los Angeles County recommend voting status.

Industry:

2026 Interim: An associate member from Endress + Hauser Flow USA, Inc is in support of this item and recommends voting status.

Advisory:

- 2026 Interim: A technical advisor from The National Institute of Technology, Office of Weights and Measures believes it is fully developed and recommends voting status.

Comments Against:

Regulatory:

- 2026 Interim: None

Industry:

- 2026 Interim: None

Advisory:

- 2026 Interim: None

Neutral Comments:

Regulatory:

- 2026 Interim: None

Industry:

- 2026 Interim: None

Advisory:

- 2026 Interim: None

Item Development:

NCWM 2026 Interim Meeting: 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. 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 A 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.~~

A.2. Exceptions. – This code does not apply to:

(a) 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.

(b) Electric Vehicle Supply Equipment (EVSEs) that provides electrical energy as vehicle fuel at no charge and is free to access. ~~used solely for dispensing electrical energy in connection with operations in which the amount dispensed does not affect customer charges or compensation.~~

(c) 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).

- (a) shall be equipped with a primary indicating element as part of the device; and
- (b) may be equipped with a primary recording element

[Nonretroactive as of January 1, 20XX]

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 displays, 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. EVSE Indicating Elements. – An EVSE used to charge electric vehicles shall include an indicating element that accumulates continuously and can displays, 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 five minutes following the charger being unplugged from the vehicle or until the next transaction is initiated. 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 0.0001 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 or Network Loss.

S.2.3.1. Transaction Information. – In the event of a power loss or network loss, which causes an interruption to power delivery, 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 or network loss, which causes an interruption to power delivery, (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:

(a) at the EVSE;

(b) at the console, if the console is accessible to the customer;

(c) via on site internet access; or

(d) 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 or network loss, which causes an interruption to power delivery, 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 or network loss, which causes an interruption to power delivery, either:

(a) the transaction shall terminate at the time of the power loss or network loss, which causes an interruption to power delivery; 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 power loss or network loss, which causes an interruption to power delivery.

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 or network loss, which causes an interruption to power delivery.

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 which can activate the EVSE, 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 non-resettable totalizer for the quantity delivered through each separate measuring device. Totalizer information shall be adequately protected and unalterable. The system shall provide totalizer information that is readily available at the time of inspection.

...

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 in 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.

1 Presently, consumers encounter various methods of sale from one EVSE to another. Some EVSEs bill by the kilowatt-
2 hour, others by the hour, and some employ both methods of sale. For consumers to make accurate value comparisons
3 between EVSEs with these different billing criteria, the consumer must be informed of the total kilowatt-hours received
4 following all transactions.

5 Exception A.2 (b) exempts devices charging by time alone (or \$0.00 per kWh) from the requirements of Section
6 3.40. Removing Exemption (b) would explicitly mandate all EVSEs to adhere to the same standards if they charge fees,
7 whether by time, or energy, or any other method. For instance, Section 2.2.6. EVSE Recorded Representation requires
8 the receipt to provide the total quantity of energy delivered, regardless of the cost per kWh, which would allow all
9 consumers to make value comparisons between EVSEs.

10 S.1

11 The requirement for an indicating element which is part of the EVSE itself is implied throughout the 3.40 Electric
12 Vehicle Fueling Systems standard, but it isn't explicitly stated as in the NIST HB 44 3.30 Liquid-Measuring Devices
13 code. This proposal would explicitly require an indicating element to be part of the device, using language nearly
14 identical to the LMD code.

15 This proposal would enhance clarity for both manufacturers and state officials alike, enabling consistent enforcement across
16 all weights and measure jurisdictions. Most EVSE models currently have some form of display, so requiring all devices
17 to have them would not increase the cost of most EVSE devices. Moreover, it would be a non-retroactive requirement,
18 taking effect with its adoption into the handbook. Consequently, existing devices would not need to be updated until they
19 require replacement or significant upgrades to their measuring systems.

20 S.1.2

21 Vermont Weights & Measures has identified numerous cases where the information on the receipt regarding the energy
22 dispensed differs from the information provided on the primary indicating element of a device. Most of these
23 discrepancies arise from rounding or truncation, but other times are simply different numbers. While these
24 inconsistencies have been minor and have not affected monetary calculations based on what we have seen thus far,
25 they may be confusing to the consumer.

26 This change aims to provide a more consistent experience for the consumer while preserving manufacturers'
27 flexibility. Unlike gas pumps or deli scales, the consumer may not be present watching the fueling process. The updated
28 language would require the important transaction-related information (total quantity of energy dispensed, total price, unit
29 price, sales tax, etc.) to be displayed on the primary indicating element after the transaction but also when the purchaser
30 is present. Currently, many EVSEs display this information immediately following the completion of power delivery,
31 typically without the consumer present. Additionally, the new language extends the time available to read and
32 comprehend this information (to 1 minute from 15 seconds) before the primary indicating element resets to the default
33 screen.

34 The revised language empowers manufacturers to display pertinent information during the charging process, so long
35 as the consumer can access all the necessary information on the primary indicating element at their leisure during the
36 fueling process.

37 S.1.3.2. & S.2.5.1

38 The number of decimal places required should be simplified because it will make it easier for manufacturers to comply
39 with the requirements. Moreover, the fourth decimal place does not affect the final dollar amount charged to the consumer
40 or the measurement integrity for most minimum measured quantity (MMQ) used during testing.

41 Numerous EVSE brands currently do not comply with the existing requirements in S.1.3.2. The quantities displayed on
42 the primary indicating element and information on the primary recording element (i.e. receipt, statement, etc.) can
43 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

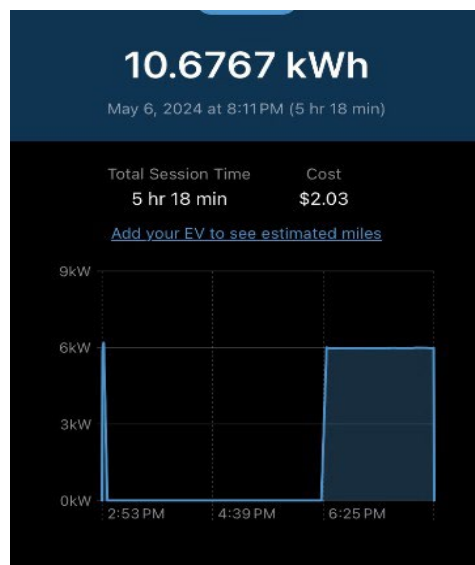


Figure 1: EVSE did not time out following a network loss during test and another consumer commenced charging on the Vermont account 2.5 hour after we had left the site.

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

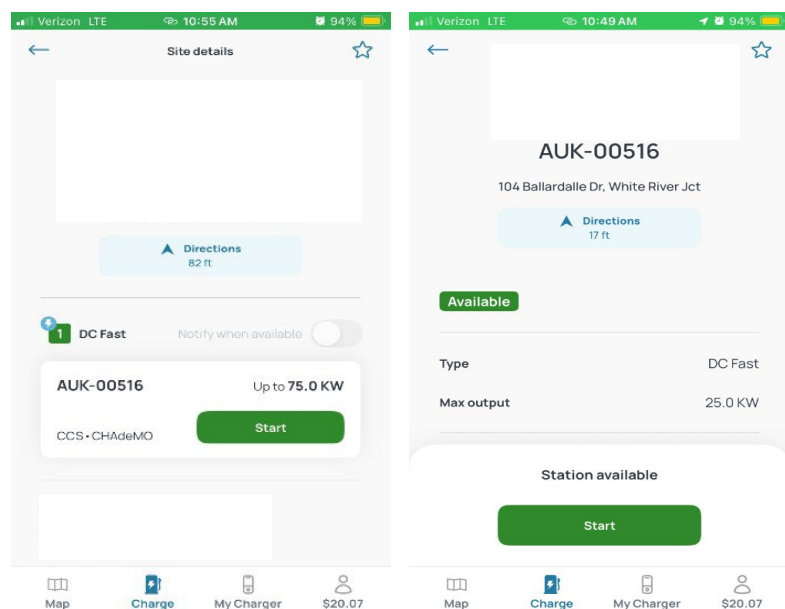


Figure 2: Two screen shot of the same EVSE taken 6 minutes apart on the same app

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.

S&T 2026 Annual Meeting Agenda

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:

2026 Interim: A regulator from Maryland supports voting status. Stated they have concerns that this industry wants to dictate how they are regulated.

2026 Interim: Regulator from California recommend a developing status or assigned to a task group. They noted that some app-based indicators are currently NTEP-approved, but only the app listed on the device's evaluation may be used and is overall in support of the item.

Industry:

- 2026 Interim: None

Advisory:

- 2026 Interim: None

Comments Against:

Regulatory:

- 2026 Interim: None

Industry:

- 2026 Interim: None

Advisory:

- 2026 Interim: None

Neutral Comments:

Regulatory:

2026 Interim: A regulator from Colorado recommends this to be assigned to the EVSE task group.

2026 Interim: A regulator from Massachusetts recommends developing and suggested reviewing utilities and EVSE providers that offer free charging.

2026 Interim: A regulator from New Jersey recommends item to be developing or assigned to task group.

2026 Interim: A regulator from Orange County California is in support of item and recommends developing or assigned, and to remove any wording of device specific exceptions.

2026 Interim: Regulator from New York recommends item to be developing.

2026 Interim: Regulator from Louisiana wonders if the item should be broken up into multiple items.

2026 Interim: Regulator from Los Angeles County California supports comments made by California and recommends it be assigned to a task group and removal of the exceptions.

2026 Interim: Regulator from Iowa echoes Los Angeles County California and recommends developing

Industry:

2026 Interim: An associate member from Tesla supports assigned status and stated that determining the maximum power that might be currently available is more technically complex than it sounds. Tesla equipment displays maximum rated power, as a static value. Power that may be available to a driver is a dynamic value and not something that can be reliably calculated or communicated to a driver ahead of time, causing confusion. Tesla does not support requirement of built-in screens as they are not used by drivers as the primary indicator for the EV charging devices.

Requiring them may have the unintended consequence of diminishing customer experience by lowering reliability and increasing cost. Tesla supports language in Handbook 44 that allows Tesla chargers to receive type evaluation with remote displays, such as the mobile app or vehicle dashboard, as the indicating element.

2026 Interim: An associate member from National Electrical Manufacturers Association recommends developing

2026 Interim: An associate member from Electrify America recommends developing and noted that requiring dynamic values may confuse and frustrate customers, as it does not reflect what they are receiving.

2026 Interim: An associate member from SWITCH recommended developing and suggested that greater uniformity would benefit the industry; however, they noted that the gas pump model is not comparable to electric vehicle charging.

2026 Interim: An associate member from ChargePoint recommends assigning to a task group.

2026 Interim: An associate member from EV Advisors, LLC supports developing status and emphasized the importance of allowing indications to be non-integral, best delivered through an app or vehicle screen. They advised against treating chargers like gas pumps and stressed giving consumers what they want.

Advisory:

- 2026 Interim: A technical advisor from The National Institute of Technology, Office of Weights and Measures stated they have not analyzed new language but supports developing due to number of changes. This version will make a whole class of devices obsolete and impact should be considered. Public utilities must be handled state by state.

Item Development:

NCWM 2026 Interim Meeting: The Committee adopted the most current language as presented in open hearings and recommends the item be assigned to the EVSE task group.

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 Skowron (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:

S&T 2026 Annual Meeting Agenda

- 1 Representative from VT – Gave a presentation explaining what is trying to be accomplished with each change. The
2 presentation is available on the NEWMA Website.
- 3 Representative from ChargePoint – Recommends developing status. Revisions of small words but big practical changes.
4 Support public utility exemption. We should develop language around how a device operates with network loss. S.2.4.2.
5 Any app language.
- 6 Representative from NEMA – Display requirement encourage that remote display should be allowed. EVSE are usedn
7 differently than gas pumps. Oppose as currently written.
- 8 Representative from NJ – S.2.4.4. The words “and billing” should be bolded. Billing system needs a definition.
9 Recommends developing status.
- 10 Representative from SWTCH – Supports ChargePoint’s comments. Supports Developing status.
- 11 Representative from MN8 Energy – Supports ChargePoint’s comments.
- 12 Representative from NY – Recommends developing status.
- 13 Committee recommends a Developing Status for this item.
- 14 SWMA 2025 Annual Meeting:
- 15 The 2025 SWMA S&T Committee heard the following comments:
- 16 Robert Huff, Delaware – S.1.2 states indication will remain on device 1 minute. Recommends 5 minutes to align with
17 gas pumps. Recommends Voting status.
- 18 Alison Wilkinson, Maryland – recommends Voting status as this item will help states and regulators clarify EV code and
19 defines gray area.
- 20 Steve Griffith, NEMA - Recommends Developing Status. He believes it to have merit but needs more development.
- 21 Mauricio Mejia, Florida – Supports item as Developing. As it is proposed, it removes the verbiage that it does not apply
22 to Non-Commercial Devices, by hour / time, and would like to have that added. Believes the primary indicator for all
23 devices is a good idea.
- 24 The committee recommends Developing status on this item.
- 25 Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to
26 <https://www.ncwm.com/publication-15> to review these documents.

27 **FMT – FARM MILK TANKS**

28 **FMT-26.1 V S.1.4. General.**

29 **Source:**
30 USDA

31 **Purpose:**
32 To add a physical address requirement to the conversion charts of on farm milk bulk tanks.

33 **Item under Consideration:**
34 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.***
[Nonretroactive as of January 1, 20XX]

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 performed 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:**

2026 Interim: A representative from USDA - support language update from NEWMA which changed “address” to “physical address”; Agrees that this would be nonretroactive; This proposal was created in conjunction with the Milk Meter Task Group; New language submitted is fully developed and requesting voting.
 2026 Interim: A regulator from NY – supports as a Voting item

Industry:

- 2026 Interim: None

Advisory:

- 2026 Interim: None

Comments Against:**Regulatory:**

- 2026 Interim: None

Industry:

- 2026 Interim: None

Advisory:

- 2026 Interim: None

Neutral Comments:**Regulatory:**

- A representative from NIST OWM – Recommends the submitter to make the item non-retroactive, questioned whether the item addresses its original purpose, recommends Developing status

Industry:

- 2026 Interim: None

Advisory:

- 2026 Interim: None

Item Development:

S&T 2026 Annual Meeting Agenda

NCWM 2026 Interim: The committee made the item nonretroactive based on the comments heard and feels the item is fully developed and assigned Voting status.

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 V 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 permanent means shall be in place to prevent any readjustment or shifting out of level after the equipment's calibration.. 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.

[Nonretroactive as of January 1, 20XX]

(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:

2026 Interim: The submitter, a regulator from the United States Department of Agriculture, worked with NIST OWM and the Milk Meter Task Group on the development of this item, and requested Voting status; The regulator stated that the new language submitted is fully developed as it was taken verbatim from existing state law; The regulator also stated that language change was made to satisfy previous concerns of a regulator from the state of Florida; This new language is not overly prescriptive.

2026 Interim: A regulator from the state of New Jersey supports the item as written and believes it is fully developed, recommends Voting status.

S&T 2026 Annual Meeting Agenda

2026 Interim: A regulator from the state of New York agrees with the comments from New Jersey that the item is ready for a vote. The regulator also stated that this language closely resembles existing New York State requirements, which are fully vetted with big milk.

2026 Interim: A regulator from the state of Maine supports this item as written and recommends Voting status.

Industry:

2026 Interim: None

Advisory:

2026 Interim: None

Comments Against:

Regulatory:

2026 Interim: None

Industry:

2026 Interim: None

Advisory:

2026 Interim: None

Neutral Comments:

Regulatory:

2026 Interim: A technical advisor from NIST OWM stated the item was revised after the 2025 NCWM Interim Meeting with language that may leave it open to misinterpretation, with one example being lack of clarity about the condition of impervious.

2026 Interim: Another technical advisor from NIST OWM asked what is impervious material? The technical advisor also stated that NIST OWM did not support the previous version of the item which specified concrete, which has issues with freezing and metal rust. The technical advisor recognized the strong support for this item but expressed uncertainty about how it could move forward as a voting item without knowing what impervious means. The technical advisor suggested creating a definition for impervious as a fix for the item.

Industry:

2026 Interim: None

Advisory:

2026 Interim: None

Item Development:

NCWM 2026 Interim Meeting: The committee updated the item to reflect the need for permanent unshifting installation and made the item nonretroactive. The committee removed language related to maintenance that is covered in the general code. The committee believes that this language is less prescriptive while still maintaining the original intent of the item. The committee believes the item is fully developed and is assigned a Voting status.

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 V 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.

(1) ~~Onemminutes 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 NIST Handbook 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:

- 2026 Interim: A Regulator from New Jersey and California supports amended wording and recommends voting status.

Industry:

- 2026 Interim: An associate member from ChargePoint supports the item and recommends developing or voting status.

Advisory:

- 2026 Interim: A technical advisor from The National Institute of Technology, Office of Weights and Measures provided updates to the wording and requested voting status on recommended language.

Comments Against:

Regulatory:

- 2026 Interim: None

Industry:

- 2026 Interim: None

Advisory:

- 2026 Interim: None

Neutral Comments:

Regulatory:

- 2026 Interim: None

Industry:

- 2026 Interim: None

Advisory:

- 2026 Interim: None

Item Development:

NCWM 2026 Interim Meeting: The committee updated the language during the work session based on comments heard during open hearings and has assigned a Voting status.

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 V 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.23. 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.34. 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.~~

...

S.1.4. Dimensions Indication, Multiple Dimension Measuring Device. – If ~~induring~~ 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~~ 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
A = AVAILABLE UPON REQUEST BY CUSTOMER⁵ 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 CUSTOMER⁵ 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)

...

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 <u>and Volumetric</u> Measuring Systems				
To Be Marked With ↓	Multiple Dimension <u>and Volumetric</u> Measuring Equipment			
	Multiple Dimension <u>or Volumetric</u> Measuring Device and Indicating Element in Same Housing	Indicating Element not Permanently Attached to Multiple Dimension <u>or Volumetric</u> Measuring Element	Multiple Dimension <u>or Volumetric</u> 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 <u>or Volume for Each Axis for Each Range in Each Axis</u> (3)(9)	x	x	x	
Value of Measuring Division, d <u>(for each axis and range)</u> (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 <u>and Volumetric</u> 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.	<u>For multiple dimension measuring systems, t</u> ~~The minimum and maximum dimensions~~ <u>for each axis and for each range in each axis (using upper or lower case type)</u> shall be marked. For example: Length: min _____ max _____ Width: min _____ max _____ Height: min _____ max _____

Table S.4.1.b.

Multiple Dimension and Volumetric Measuring Systems Notes for Table S.4.1.a.

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).
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**)

...

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)

...

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.”

...

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)

...

~~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)

...

~~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)

<u>Table T.3.1.</u> <u>Maintenance Tolerances</u> <u>(All values in this table are in measuring divisions)</u>			
<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
<u>0 – 200¹</u>	<u>201 – 400</u>	<u>401- 800</u>	<u>801 +</u>
<u>¹ See S.1.7. Minimum Measurement (12 d).</u>			

(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**)

...

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.

S&T 2026 Annual Meeting Agenda

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:

2026 Interim: Regulators from Iowa, New York, Florida, Minnesota, and Arizona support this item and recommend voting status.

Industry:

2026 Interim: An associate member from Waltz Scale recommends voting.

2026 Interim: An associate member from Richard Suiter Consulting stated, during the presentation, that the item is complete and ready to vote.

2026 Interim: An associate member from Rice Lake Weighing System recommends the item be given a voting status.

Advisory:

- 2026 Interim: A technical advisor with The National Institute of Standards and Technology, Office of Weights and Measures, recommends voting status and explained that separating the terms MDMD, VMD and specifically outline which device could measure volume.

Comments Against:

Regulatory:

2026 Interim: None

Industry:

- 2026 Interim: An associate member from the Scale Manufacturers Association opposes this item as written and recommends it be assigned a developing status.

Advisory:

- 2026 Interim: No comments were heard from the floor.

Neutral Comments:

Regulatory:

2026 Interim: A regulator from Maryland recommended an informational session be held during the 2026 Annual meeting to assist regulators with a better understanding of the technology and ask questions.

Industry:

2026 Interim: An associate member from Guidant Measurement questioned why an MDMD states it is used to measure volume?

2026 Interim: An associate member from Endress + Hauser posed the question if this device could be used for liquids? An associate member from Richard Suiter Consulting replied these devices are not for liquids. An associate member from Wingfield Scale Company explained the device does not measure liquids because lidar refracts in liquids.

2026 Interim: An associate member from Richard Suiter Consulting responded to Guidant Measurement and Endress + Hauser that the NTEP Certificate of Conformance outlines the commodities that can be measured.

Advisory:

- 2026 Interim: None

Item Development:

NCWM 20226 Interim Meeting: After hearing comments from the floor the committee believes the item is fully developed and assigned a Voting status.

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 V 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.

1 The submitter requested voting status.

2 **Comments in Favor:**

3 **Regulatory:**

- 4 • 2026 Interim: None

5 **Industry:**

6 2026 Interim: Associate members from Zebra Technologies, The Scale Manufacturers Association, Richard
7 Suiter Consulting, and Wingfield Scale Company support this item and recommend it be assigned a voting
8 status.

9 **Advisory:**

- 10 • 2026 Interim: None

11 **Comments Against:**

12 **Regulatory:**

- 13 • 2026 Interim: None

14 **Industry:**

- 15 • 2026 Interim: None

16 **Advisory:**

- 17 • 2026 Interim: None

18 **Neutral Comments:**

19 **Regulatory:**

- 20 • 2026 Interim: None

21 **Industry:**

- 22 • 2026 Interim: None

23 **Advisory:**

- 24 • 2026 Interim: A technical advisor from The National Type Evaluation Program stated no position but this
25 item would allow new technology into the market which in turn would allow the National Type Evaluation
26 Program to certify these devices.

27 **Item Development:**

28 NCWM 2026 Interim Meeting: After hearing comments from the floor the committee believes that the item is fully
29 developed and assigned a Voting status.

30 **Regional Associations' Comments:**

31 WWMA 2025 Annual Meeting:

32 No comments were received during open hearings.

33 The 2025 WWMA S&T Committee does not recommend a status. During Open Hearings there was no technical analysis
34 available, and no comments were heard on the item. The committee encourages feedback from stakeholders and looks
35 forward to an analysis from NIST OWM to help formulate a position.

36 CWMA 2025 Interim Meeting:

S&T 2026 Annual Meeting Agenda

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.newm.com/publication-15> to review these documents

OTH – OTHER ITEMS

OTH-25.1 A 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	<u>Weigh-In-Motion Systems Used for Vehicle Direct Enforcement</u>	238
A. Application		238
A.1. General		238
A.2. Exception		238
A.3. Additional Code Requirements		238
S. Specifications		238
S.1. Design of Indicating and Recording Elements and of Recorded Representations		238
S.1.1. Ready Indication		238
S.1.2. Value of System Division Units		238
S.1.3. Maximum Value of Division		238
S.1.4. Value of Other Units of Measure		238
S.1.5. Capacity Indication		239
S.1.6. Identification of a Fault		239

1	<u>S.1.7. Recorded Representations.</u>	239
2	<u>S.1.8. Value of the Indicated and Recorded System Division.</u>	240
3	<u>S.2. System Design Requirements.</u>	240
4	<u>S.2.1. Violation Parameters.</u>	240
5	<u>S.3. Design of Weighing Elements.</u>	240
6	<u>S.3.1. Multiple Load-Receiving Elements.</u>	240
7	<u>S.4. Design of Weighing Devices.</u>	240
8	<u>S.5. Design of Balance.</u>	240
9	<u>S.5.1. Zero-Tracking Device.</u>	240
10	<u>S.5.2. Totalizing Device.</u>	240
11	<u>S.5.3. Vehicle Recognition/Presence Device.</u>	241
12	<u>S.6. Accidental Breakdown and Maladjustment.</u>	241
13	<u>S.7. Marking Requirements.</u>	241
14	<u>S.7.1. Location of Marking Information.</u>	241
15	<u>N. Notes.</u>	241
16	<u>N.1. Test Procedures.</u>	241
17	<u>N.1.1. Selection of Test Vehicles.</u>	241
18	<u>N.1.2. Test Loads.</u>	242
19	<u>N.1.3. Reference Scale.</u>	242
20	<u>N.1.4. Test Speeds.</u>	243
21	<u>N.1.5. Reference Axle Spacings.</u>	243
22	<u>N.1.6. Test Procedures.</u>	243
23	<u>T. Tolerances</u>	244
24	<u>T.1. Principles.</u>	244
25	<u>T.1.1. Design.</u>	244
26	<u>T.2. Tolerance Values.</u>	244
27	<u>T.2.1. Acceptance Tolerance.</u>	244
28	<u>T.2.2. Tests Involving Digital Indications or Representations.</u>	244
29	<u>T.2.3. Maintenance Tolerance Values for Dynamic Load Test.</u>	244
30	<u>T.2.4. Tolerance Value for Axle Spacing.</u>	244
31	<u>T.3. Influence Factors.</u>	245
32	<u>T.3.1. Temperature.</u>	245
33	<u>T.3.2. Temperature Effect on Zero-Load Balance.</u>	245
34	<u>T.3.3. Power Supply.</u>	245
35	<u>T.4. Radio Frequency Interference (RFI) and Other Electromagnetic Interference Susceptibility.</u>	245
36	<u>UR. User Requirements</u>	245
37	<u>UR.1. Selection Requirements.</u>	245
38	<u>UR.2. Installation and Maintenance.</u>	245
39	<u>UR.2.1. System Modification.</u>	245
40	<u>UR.2.2. Foundation, Supports, and Clearance.</u>	245
41	<u>UR.2.3. Access to Weighing Elements.</u>	245
42	<u>UR.2.4. Site Selection.</u>	245
43	<u>UR.3. Maximum Load.</u>	245
44	<u>UR.4. Enforcement Guidance.</u>	245
45	<u>UR.5. Notification of Violation.</u>	246

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.

1 S.1.4.3. Vehicle Length. – If the system is capable of measuring the overall length of the vehicle, the length
2 of the vehicle shall be measured in feet and/or inches, or meters.

3 S.1.5. Capacity Indication. – An indicating or recording element shall not display nor record any values
4 greater than 105 % of the specified capacity of the load receiving element.

5 S.1.6. Identification of a Fault. – Fault conditions affecting accuracy as specified in Table T.2.3.
6 Maintenance Tolerances shall be presented to the operator in a clear and unambiguous means. No weight
7 values shall be indicated or recorded when a fault condition is detected. The following fault conditions shall
8 be identified:

9 (a) Vehicle speed is below the minimum or above the maximum system specified speed.

10 (b) The maximum number of vehicle axles as specified has been exceeded.

11 (c) A change in vehicle speed greater than that specified has been detected.

12 (d) Imbalanced weight between the left and right wheels has exceeded the specified values.

13 (e) Vehicle has changed lanes between or in the proximity of the first and the last sensors.

14 (f) Any axle or wheel, or part of each is not on the load-receiving element of the sensors.

15 (g) Vehicle direction of travel is not valid for the installation.

16 S.1.7. Recorded Representations.

17 S.1.7.1. Values to be Recorded. – At a minimum, the following values shall be printed and/or stored
18 electronically for each vehicle weighing:

19 (a) transaction identification number;

20 (b) station ID;

21 (c) lane identification (required if more than one lane at the site has the ability to weigh a vehicle in
22 motion);

23 (d) vehicle speed;

24 (e) number of axles;

25 (f) weight of each axle;

26 (g) identification and weight of axle groups;

27 (h) axle spacing;

28 (i) gross vehicle weight;

29 (j) total vehicle length;

30 (k) all fault conditions that occurred during the weighing of the vehicle, as identified in paragraph
31 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:

1 (a) automatically, in which case the instrument shall be provided with a vehicle recognition device
2 defined in S.5.3. Vehicle Recognition/Presence Device; or

3 (b) semi-automatically (e.g., it operates automatically following a manual command).

4 S.5.3. Vehicle Recognition/Presence Device. – WIM systems which are able to operate without the
5 intervention of an operator shall be provided with a vehicle recognition device. The device shall detect the
6 presence of a vehicle in the weigh zone and shall detect when the whole vehicle has been weighed. WIM systems
7 shall not indicate or print the vehicle mass unless all wheel loads of the vehicle have been weighed.

8 S.6. Accidental Breakdown and Maladjustment. – WIM systems shall be so constructed that an accidental
9 breakdown or maladjustment of control elements likely to disturb its correct functioning cannot take place
10 without its effect being evident.

11 S.7. Marking Requirements. – In addition to the marking requirements in G-S.1. Identification, the system shall
12 be marked with the following information:

13 (a) value of the system division “d”;

14 (b) operational temperature limits;

15 (c) number of instrumented lanes (not required if only one lane is instrumented);

16 (d) minimum and maximum vehicle speed;

17 (e) maximum number of axles per vehicle;

18 (f) maximum change in vehicle speed during weighing;

19 (g) minimum and maximum load;

20 (h) any restrictions specified in the NTEP Certificate of Conformance; and

21 (i) accuracy class.

22 S.7.1. Location of Marking Information. – The marking information required in Section 1.10. General
23 Code, G-S.1. Identification and S.7. Marking Requirements shall be visible after installation. The information
24 shall be marked on the system or recalled from an information screen.

25 N. Notes

26 N.1. Test Procedures.

27 N.1.1. Selection of Test Vehicles. – All dynamic testing associated with the procedures described in each of
28 the subparagraphs of N.1.6 Test Procedures shall be performed with vehicles of these three types, at a
29 minimum.

30 (a) a two-axle, six-tire, single-unit truck or Federal Highway Administration (FHWA) Class 5; that is, a
31 vehicle with two axles with the rear axle having dual wheels;

32 (b) a three-axle, single-unit truck or FHWA Class 6; and

33 (c) a five-axle, single-trailer truck or FHWA Class 9 (3S2 Type).

34 (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)
	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	$\pm 5 \%$	$\pm 10 \%$
Axle Load	$\pm 10 \%$	$\pm 20 \%$
Axle Group Load (including bridge formula)	$\pm 8 \%$	$\pm 15 \%$

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 axles 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, C2SMART and 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.

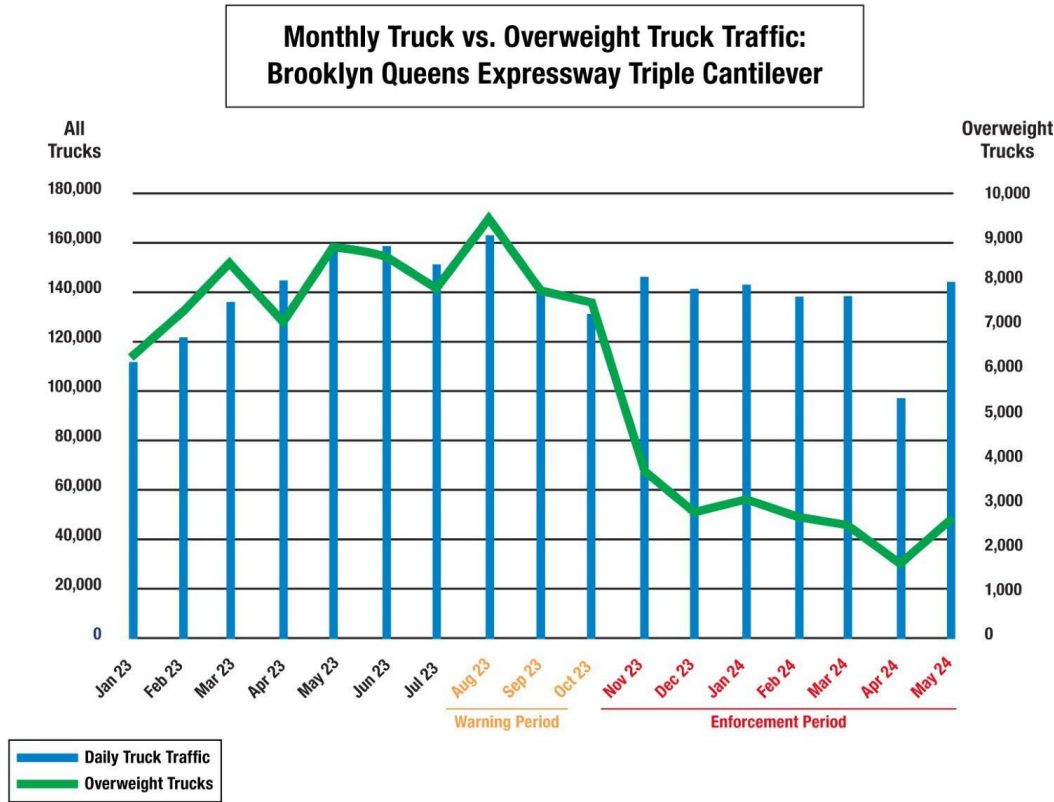


Figure 1 – Monthly Truck versus Overweight Truck Traffic on Brooklyn Queens Expressway (BQE) Triple Cantilever Structure

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. REVIEWS 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 manufacturers 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 weightments 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).

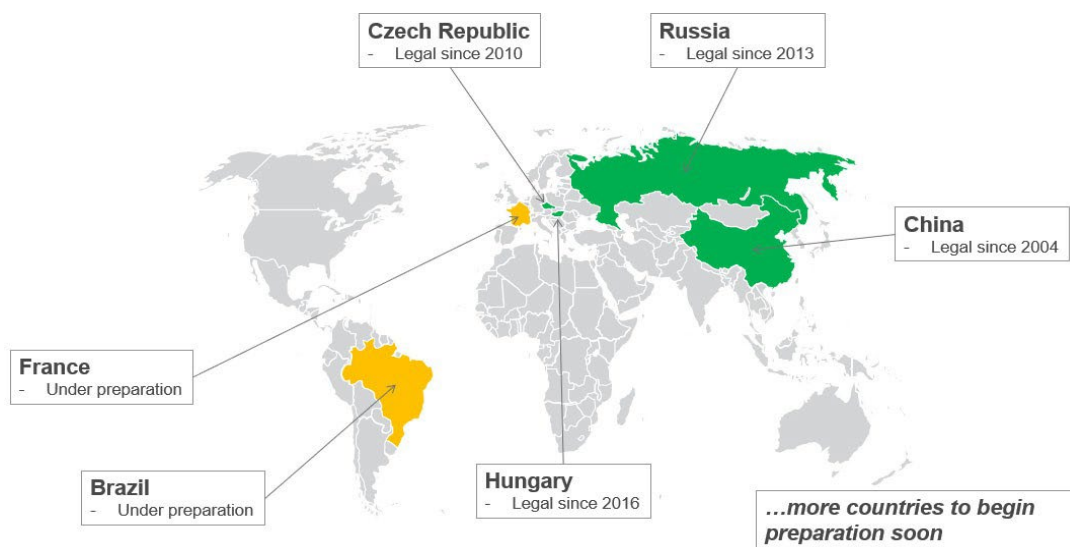


Figure 2. Automated enforcement around the world

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:

- 2026 Interim: Regulators from New Jersey, New York, Iowa, and Massachusetts support this item as written and recommend it be assigned a voting status.
- 2026 Interim: A regulator from New York stated that these systems will not replace regular weigh stations, instead the code would provide a roadmap to use these devices for enforcement.

Industry:

- 2026 Interim: Associate members from Quarterhill and Rutgers support this item and recommends it be assigned a voting status.

Advisory:

- 2026 Interim: A technical advisor from the National Institute of Standards and Technology, Office of Weights and Measures feels all technical problems have been addressed and recommends it be assigned a voting status

Comments Against:

Regulatory:

- 2026 Interim: A regulator from Arkansas opposes this item and recommends it be withdrawn with concerns based on opposing the intended use, permanence of the device, accuracy, and potential environmental effects on the device.
- 2026 Interim: A regulator from West Virginia opposes this item and recommends it be withdrawn stating the tolerances are too large and all variables are not accounted for.
- 2026 Interim: A regulator from California agrees with Arkansas and West Virginia and recommends the item be withdrawn.
- 2026 Interim: A regulator from Delaware is opposed to the item stating concerns on using wheel load weighers as a standard and recommends the item be withdrawn.
- 2026 Interim: A regulator from Maryland opposes the item as written and provided suggested amendments to the submitter of the item and committee in writing to include added wording to outline enforcement only

S&T 2026 Annual Meeting Agenda

when tolerances are exceeded; the ability to retrieve recorded values for one year; remove sections indicating axle-load, portable axle-load weighers, wheel load weighers as a reference standard; provide clarity to reference scale testing timeline; and additional suggested wording; the regulator recommends a voting status with these suggested amendments.

- 2026 Interim: A regulator from Louisiana states the item needs more work and recommends assignment to a task group.

Industry:

- 2026 Interim: An associate member from the Scale Manufacturers Association says they oppose this item and recommends it be withdrawn.
- 2026 Interim: An associate member from the National Motor Freight Traffic Association spoke in opposition stating concerns surrounding tolerances and accuracy of the device and safety checks not being utilized due to automatic nature.

Advisory:

- 2026 Interim: None

Neutral Comments:

Regulatory:

- 2026 Interim: None

Industry:

- 2026 Interim: None

Advisory:

- 2026 Interim: None

Item Development:

NCWM 2026 Interim Meeting: The Specification and Tolerances committee is requesting the formation of a task group to further develop this item. The committee recommends an Assigned 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 Hainey (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 assessed 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 V 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, EVSE. – A test intended to determine the proper operation of the measuring, indicating, and recording elements to automatically, accurately, clearly, and separately provide all required transaction information, as set forth in NIST Handbook 44 Sections 3.40. and 5.55., for an EVSE designed to assess time-based fees associated with the fees for the delivery of electrical energy (by the kilowatt-hour) to an EV. [5.55]
(Added 20XX)

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:

- 2026 Interim: Regulators from New Jersey, California, and Florida support the item and recommend it be assigned a developing status.

Industry:

- 2026 Interim: No comments heard from the floor.

Advisory:

- 2026 Interim: A technical advisor from the National Institute of Standards and Technology, Office of Weights and Measures spoke in support of the item and recommend additional language to include "EVSE" with a voting status.

Comments Against:

S&T 2026 Annual Meeting Agenda

Regulatory:

- 2026 Interim: None

Industry:

- 2026 Interim: None

Advisory:

- 2026 Interim: None

Neutral Comments:

Regulatory:

- 2026 Interim: None

Industry:

- 2026 Interim: An associate member from Guidant Measurement asks for clarification of wording recommending “Time base portions of the fee.” In place of the current language. A technical advisor from the National Institute of Standards and Technology, Office of Weights and Measures provided clarification and updated wording for consideration.

Advisory:

- 2026 Interim: None

Item Development:

NCWM 2026 Interim Meeting: After hearing comments from the floor the committee amended the item language to reflect the suggestions offered by NIST OWM and assigned a Voting status.

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 interference 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 interference 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 V 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). ~~The value of the scale division, expressed in units of mass, is~~ the 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~~interval, value of (e)”) [2.20, **2.21**, 2.22, **2.24**]

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:

- 2026 Interim: A representative from California Division of Measurement Standards, Supports with NIST edits

Industry:

- 2026 Interim: A representative from the Scale Manufacturers Association, Supports Voting

Advisory:

- 2026 Interim: A representative from NIST, Supports with changes to pub 15, the item is ready for voting.

Comments Against:

Regulatory:

- 2026 Interim: None

Industry:

- 2026 Interim: None

Advisory:

- 2026 Interim: None

Neutral Comments:

Regulatory:

- 2026 Interim: None

Industry:

- 2026 Interim: None

Advisory:

- 2026 Interim: None

Item Development:

NCWM 2026 Interim Meeting: After hearing comments from the floor the committee amended the item language to reflect the suggestions offered by NIST OWM and assigned a Voting status.

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 I 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

Page	Section 5.60. Transportation Network Measurement Systems – Tentative Code	5 101
A.	APPLICATION	5 101
A.1.	General	5 101
A.2.	Exceptions	5 101
A.3.	Additional Code Requirements	5 101
S.	SPECIFICATIONS	5 101
S.1.	Design of Indicating and Recording Elements	5 101
S.1.1.	General Indicating Elements	5 101
S.1.2.	General Recording Elements	5 102
S.1.3.	Identification	5 102
S.1.4.	Location of Identification Information	5 102
S.1.5.	Display of Rates and Additional Charges	5 102
S.1.6.	Fare Estimates	5 102
S.1.7.	Actuation of Measurement System	5 102
S.1.8.	Fare Adjustment	5 102
S.1.9.	Fare Identification and Other Charges	5 103
S.1.10.	Receipt	5 103
S.1.11.	Driver's Summary	5 103

1	S.2. Provision for Sealing	5 104
2	S.2.1. System Security	5 104
3	S.2.2. System Audit	5 104
4	S.2.3. Change Tracking.....	5 104
5	S.3. Provision for Trip Data Loss.....	5 104
6	S.3.1. Intermittent Trip Data Loss.....	5 104
7	S.3.2. Significant Trip Data Loss	5 104
8	S.3.3. Alternative Fare Structures	5 104
	N. NOTES	5 104
9	N.1. Distance Tests.....	5 104
10	N.1.1. Test Methods	5 104
11	N.1.2. Test Procedures.....	5 105
12	N.1.3. Test Conditions.....	5 105
13	N.2. Time Test.....	5 105
	T. TOLERANCES.....	5 106
14	T.1. Tolerance Values	5 106
15	T.1.1. Distance Tests.....	5 106
16	T.1.2. Time Tests	5 106
17	T.2. Tests Using Transfer Standards	5 106
	UR. USER REQUIREMENTS.....	5-106
	UR.1. System Indications	5-106
18	UR.1.1. Statement of Rates	5 106
	UR.2. Change Tracking.....	5-106
	UR.3. System Installation and Operation.....	5-106
	UR.4. Fare Estimates.....	5-106
	UR.5. Determination of Total Charges When Location Service Data Is Lost.....	5-106
19	APPENDIX D. DEFINITIONS	5 107
20	digital network.....	5 107
21	network arranged ride.....	5 107
22	transportation network company.....	5 107
23	transportation network company driver	5 107
24	transportation network company rider	5 107
25	transportation network measurement system	5 107

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

(e) ~~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.

§.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 tolerance 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 I 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~~ <u>Transportation-for-Hire-Systems</u>	270
A. Application		270
A.1. General		270
A.2. Exceptions		270
A.3. Additional Code Requirements		270
S. Specifications		270
S.1. Design of Indicating and Recording Elements		270
S.1.1. General		270
S.1.1.1. Recording Elements, General		271
S.1.2. Advancement of Indicating Elements		271
S.1.3. Visibility of Indications		272
S.1.4. Actuation of Fare Indicating Mechanism		273
S.1.5. Operating Condition		273
S.1.6. Fare Identification		273
S.1.7. Extras		273
S.1.8. Protection of Indications		274
S.1.9. Recorded Representation		274
S.1.10. Non-fare Information		275
S.1.12. Electronic Receipt Required		275
S.2. Basis of Fare Calculations		275
S.2.1. Initial Time and Distance Intervals		275
S.3. Design of Operating Control		275
S.3.1. Positions of Control		275
S.3.2. Control for Extras Mechanism		275
S.4. Interference		275
S.5. Provision for Security Seals		276
S.5.1. Taximeter Connected to Networked Systems		277
S.5.2. Taximeters Calibrated to Specific Vehicles		277
S.6. Power Interruption, Electronic Taximeters		277
S.7. Measurement Signal Loss		278
S.7.1. Intermittent Trip Data Loss		278
S.7.2. Significant Trip Data Loss		278
S.8. Anti-Fraud Provisions, Electronic Taximeters		278
N. Notes		278
N.1. Distance Tests		278
N.1.1. Test Methods		278
N.1.2. Test Procedures		279
N.1.3. Test Conditions		279
N.2. Time Test		280

1	N.3. Interference Test.	280
2	T. Tolerances	280
3	T.1. Tolerance Values.	280
4	T.1.1. On Distance Tests.	280
5	T.1.2. On Time Tests.	280
6	T.1.3. On Interference Tests.....	281
7	T.2. Tests Using Transfer Standards.	281
8	UR. User Requirements	281
9	UR.1. Inflation of Vehicle Tires.....	281
10	UR.2. Position and Illumination of Taximeter.	281
11	UR.3. Statement of Rates.	281
12		

Section 5.54. TaximetersTransportation-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, ~~Taximeter~~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.1.42.4. 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.1.910. 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.1.23. Advancement of Indicating Elements. – ~~Except when a taximeter is being cleared, t~~The 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.1.23.42. 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, 202020XX]~~

~~(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.1.34. 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.1.34.1. – 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.1.34.21.1. 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.1.34.31.2. 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.1.34.31.2.1. Additional Information.— *Additional information shall be displayed or made available through a passenger’s indicating element (as described in S.1.34.31.2 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.1.34.31.23. 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.1.45. 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.1.56. Operating Condition.

S.1.56.1. 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.1.56.2. 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.1.56.3. 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.1.67. 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.1.78. 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.1.78.1. 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.1.89. Protection of Indications. – All indications of fare and extras shall be protected from unauthorized alteration or manipulation.

(Amended 2015)

S.1.910. 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.1.910.1. 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 ~~V~~vacant condition, and such information is only displayed for 10 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:

$$\frac{\text{Seconds of Initial Time Interval}}{\text{Seconds per Non – Initial Time Interval}} = \frac{\text{Distance of Initial Mileage Interval}}{\text{Distance per Non – Initial Mileage Interval}}$$

(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~~ <u>components that may be removed from the vehicle, a combination of physical seals and one for configuration parameters</u> 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

S&T 2026 Annual Meeting Agenda

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:

- 2026 Interim: A representative from Transportation-For-Hire Systems Task Group, The block was designed to bring all the disparate codes under one umbrella. The new code would allow the regulation of all transportation-for-hire systems and bring some equity to the marketplace. Due to technological evolution, the code is as developed as it can be at this time and recommends a voting status. In response to a question from the floor: Uber did participate but left task group when they felt the proposal was finished. Ride-share companies should be regulated equitably but not necessarily the same way as taxis. This proposal would not change the way industry operates.
- 2026 Interim: A representative from Louisiana Department of Agriculture supports a voting status.
- 2026 Interim: A representative from Orange County Weights & Measures, Supports the proposal. There is a level of ambiguity around exemptions for flat rate charges, when, and how to regulate them. Language around quoted price verse fee rate needs refinement.

Industry:

- 2026 Interim: None

Advisory:

- 2026 Interim: None

Comments Against:

Regulatory:

- 2026 Interim: None

Industry:

- 2026 Interim: None

Advisory:

- 2026 Interim: None

Neutral Comments:

Regulatory:

2026 Interim: A representative from LA County Agricultural Commissioner/Weights & Measures, believes this item has merit and recognizes the hard work the committee has done. They recommend an assigned status because there are few items that will require additional clarification. They have three concerns that require additional clarification due to opportunities for exploitation. 1. Good Faith Estimates. 'Good Faith' is subjected to change when circumstances arise. 2. Surge pricing exploitation. 3. The testing of the application will be based on random sampling. Additional clarification is needed to provide guardrails to prevent software exploits.

2026 Interim: A representative from San Diego County Department of Agriculture, Weights & Measures, this is an important proposal, as increasingly taxis are turning to new technology that is imperfectly covered by the code as it is written. There is still room for editing and refinement. Modern Rideshare systems provide customers a price up front, which fall into the first exemption, but how would the new code apply in the cases where the price changes due to conditions or route. This proposal also includes a note that allows jurisdictions to test a sample of Transport Network System devices in their jurisdiction rather than all of them. More details are needed around this section of the item. This proposal is needed, and the Task Group

has made great progress, but fundamental question of scope and the implications of sample-based inspections need to be resolved before moving forward. Recommend this item remain assigned to the Task Group.

2026 Interim: A representative from California Division of Measurement Standards, Appreciates the work done by the task group, but supports CA county comments. Not fully developed and recommends assigned status.

2026 Interim: A representative from San Diego County Department of Agriculture, Weights & Measures, Question: Did the participants feel that this code would apply to them?

Industry:

- 2026 Interim: None

Advisory:

- Interim 2026 A representative from NCWM, once members of the task group thought the work was done, they began dropping off, so maybe the full group should be reconvened.

Item Development:

2026 Interim Meeting: Upon receiving comments during open hearings the committee addressed two concerns by providing updated language in 5.54 Transportation for Hire Systems A.1. (b) to clarify application of good faith estimates. Additional updates to language include clarification of jurisdictional authority on appropriate representative sample size determination. The committee assigned this item Informational status to receive additional comments during the annual meeting

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 V 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: HGM-26.1 V A.4. Type Evaluation.

Item was improperly identified in NCWM Publication 15, January 2026, as HGV-26.1

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.

S&T 2026 Annual Meeting Agenda

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 V 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 V 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:

S&T 2026 Annual Meeting Agenda

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 V A.3. Type Evaluation.

Item under Consideration:

Amend NIST Handbook 44 Grain Moisture Meter 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:

2026 Interim: A representative from LA County Agricultural Commissioner/Weights & Measures, Supports a voting status with changes.

2026 Interim: A representative from California Division of Measurement Standards, Supports a voting status.

2026 Interim: A representative from New Jersey Weights & Measures, Supports a voting status.

2026 Interim: A representative from New York Department of Agriculture & Markets, Supports a voting status.

2026 Interim: A representative from Florida Department of Agriculture and Consumer Services, Supports a voting status.

Industry:

2026 Interim: A representative from Richard Suiter Consulting, Agrees the wording should be removed and supports voting status.

2026 Interim: A representative from Endress + Hauser Flow USA, Inc., Supports a voting status.

Advisory:

2026 Interim: A representative from NIST stated, tentative codes did not have language removed as it should have been, so this item corrects that oversight. They support a voting status.

2026 Interim: A representative from NTEP stated, NTEP supports the item with these changes.

Comments Against:

Regulatory:

- 2026 Interim: None

Industry:

- 2026 Interim: None

Advisory:

- 2026 Interim: None

Neutral Comments:

Regulatory:

- 2026 Interim: None

Industry:

- 2026 Interim: None

Advisory:

- 2026 Interim: None

Item Development:

2026 Interim Meeting: The committee has assigned a Voting status to this item based on comments heard during the open hearing.

The Committee noted that the item was incorrectly identified in Publication 15 at the NCWM 2026 Interim Meeting. The item was corrected from HGV-26.1 to HGM-26.1

The item B2: GMA-26.1 was incorrectly titled for Non-Utility Electric Measuring Systems and has been revised to include Grain Moisture Meter.

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 3 because 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: SCL-26.1 V Table S.1.11. Categories of Device and Methods of Sealing

Item under Consideration:

Amend NIST Handbook 44 Scales Code as follows:

Table S.1.11. 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.	The hardware enabling access for remote communication must be at the device and sealed using a physical seal or two event counters: one for calibration parameters and one for configuration parameters.
Category 3: Remote configuration capability access may be unlimited or controlled through a software switch (e.g., password).	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.~~ <u>The event logger information shall be available at the time of inspection either as a printed copy or transmitted in an electronic format.</u> 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.)

1 [Nonretroactive as of January 1, 1999]
 2 (Table Added 1998) (Amended 20XX)

3 **B3: BCS-26.1 V Table S.2.6. Categories of Device and Methods of Sealing**

4 **Item under Consideration:**

5 Amend NIST Handbook 44 Belt Conveyor Systems Code as follows:

Table S.6. Categories of Device and Methods of Sealing	
Categories of Devices	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 3: Remote configuration capability.	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.~~ <u>The event logger information shall be available at the time of inspection either as a printed copy or transmitted in an electronic format.</u> 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.)

6 [Nonretroactive as of January 1, 1999]
 7 (Table Added 1998) (Amended 20XX)

1 **B3: AWS-26.1 V Table S.1.3. Categories of Device and Methods of Sealing**2 **Item under Consideration:**

3 Amend NIST Handbook 44 Automatic Weighing Systems Code as follows:

Table S.1.3. 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.	The hardware enabling access for remote communication must be at the device and sealed using a physical seal or two event counters: one for calibration parameters and one for configuration parameters.
Category 3: Remote configuration capability access may be unlimited or controlled through a software switch (e.g., password).	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.~~ <u>The event logger information shall be available at the time of inspection either as a printed copy or transmitted in an electronic format.</u> 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.)

4

1 **B3: LMD-26.2 V Table S.2.2. Categories of Device and Methods of Sealing**2 **Item under Consideration:**

3 Amend NIST Handbook 44 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 at the individual device, means must be provided to generate a hard copy of the information through an on-site device.]* [*Nonretroactive as of January 1, 1996]
Category 3: Remote configuration capability access may be unlimited or controlled through a software switch (e.g., password). [Nonretroactive as of January 1, 1995] 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. [Nonretroactive as of January 1, 2001]	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 be available at the time of inspection either as a printed copy or <u>transmitted in an</u> electronic format. ~~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.)

[Nonretroactive as of January 1, 1995]

(Table Added 1993) (Amended 1995, 1998, 1999, 2006, 2015, ~~and 2022~~, and 20XX)

B3: VTM-26.1 V 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 onsite 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.~~ <u>The event logger information shall be available at the time of inspection either as a printed copy or transmitted in an electronic format.</u> 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, 1995]

(Table Added 2006) (Amended 2016 and 20XX)

Previous Status:

New Proposal

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

During the WWMA 2025 Annual Conference the following comments were received:

S&T 2026 Annual Meeting Agenda

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.,

S&T 2026 Annual Meeting Agenda

- 1 3.35 MM Table S.2.3.,
- 2 3.36 WM Table S.2.1.,
- 3 3.37 MFM Table S.3.5.,
- 4 3.38 CDLM Table S.2.5.,
- 5 3.39 HGM Table S.3.3.,
- 6 3.40 EVFS Table S.3.3.,
- 7 3.41 NUEMS Table S.2.2.
- 8 This proposal allows for a device to be designed so that the event log can be obtained by some format, securely
- 9 He recommends Voting Status.
- 10 Brent Price, Gilbarco – supports the item moving forward as Voting - be sure to include LMDs as part of this
- 11 Alison Wilkinson, Maryland - supports Voting status
- 12 The committee recommends Voting status on the item, as revised and with the additional editorial revision removing the
- 13 extra period in 3.4.1 NUEMs, changing it to 3.41 NEUMS.
- 14 Comments apply for all Block 3 items.
- 15 S&T committee added LMD-26.2 to the addendum sheet because it was left off from the form 15 codes to be edited.

1 **B3: LPG-26.1 V Table S.2.2. Categories of Device and Methods of Sealing**

2 **Item under Consideration:**

3 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 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.~~ <u>The event logger information shall be available at the time of inspection either as a printed copy or transmitted in an electronic format.</u> 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, 1995]

(Table Added 2006) (Amended 2016 and 20XX)

4 **Previous Status:**

5 New Proposal

6 **Regional Associations' Comments:**

7 WWMA 2025 Annual Meeting:

8 During the WWMA 2025 Annual Conference the following comments were received:

S&T 2026 Annual Meeting Agenda

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.)

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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.

1 **B3: CLM-26.1 V Table S.2.5. Categories of Device and Methods of Sealing**2 **Item under Consideration:**

3 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. <i>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.</i>	<i>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.</i>
Category 3: Remote configuration capability access may be unlimited or controlled through a software switch (e.g., password). <i>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.</i>	<i>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. <u>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 shall be available at the time of inspection either as a printed copy or transmitted in an electronic format.</u> 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.)</i>

[Nonretroactive as of January 1, 1995]

(Table Added 2006) (Amended 2016 **and 20XX**)

4

5 **Previous Status:**

6 New Proposal

7 **Regional Associations' Comments:**8 WWMA 2025 Annual Meeting:

9 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.

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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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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:

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 V 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.
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.~~ <u>The event logger information shall be available at the time of inspection either as a printed copy or transmitted in an electronic format.</u> 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, 1995]

(Table Added 2006) (Amended 2016 and 20XX)

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

S&T 2026 Annual Meeting Agenda

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.

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.

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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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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:

The committee recommends a developing status for this item.

SWMA 2025 Annual Meeting:

The committee recommends voting status for this item.

1 **B3: WTR-26.1 V Table S.2.1. Categories of Device and Methods of Sealing**

2 **Item under Consideration:**

3 Amend NIST Handbook 44 Water Meters Code as follows:

Table S.2.1. 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.
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4 [Nonretroactive as of January 1, 2019]
5 (Table Added 2018) **(Amended 20XX)**

6 **Previous Status:**

7 New Proposal

8 **Regional Associations' Comments:**

9 WWMA 2025 Annual Meeting:

10 During the WWMA 2025 Annual Conference the following comments were received:

11 Mr. Loren Minich (NIST Office of Weights and Measures): NIST OWM has not had time to evaluate this block of items
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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: MFM-26.1 V 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. <i>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.</i>	<i>[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.]*</i> <i>[*Nonretroactive as of January 1, 1996]</i>
Category 3: Remote configuration capability access may be unlimited or controlled through a software switch (e.g., password). <i>[Nonretroactive as of January 1, 1995]</i> <i>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.</i> <i>[Nonretroactive as of January 1, 2001]</i>	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.~~ <u>The event logger information shall be available at the time of inspection either as a printed copy or transmitted in an electronic format.</u> 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, 1995]

(Table Added 1995) (Amended 1995, 1998, 1999, 2006, ~~and 2016,~~ and 20XX)

Previous Status:

New Proposal

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

During the WWMA 2025 Annual Conference the following comments were received:

S&T 2026 Annual Meeting Agenda

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. 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.

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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.

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:

The committee recommends a developing status for this item.

SWMA 2025 Annual Meeting:

The committee recommends voting status for this item.

1 **B3: CDL-26.2 V Table S.2.5. Categories of Device and Methods of Sealing**2 **Item under Consideration:**

3 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. <i>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.</i>	<i>The hardware enabling access for remote communication must be onsite. 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.</i>
Category 3: Remote configuration capability access may be unlimited or controlled through a software switch (e.g., password). <i>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.</i>	<i>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.~~ <u>The event logger information shall be available at the time of inspection either as a printed copy or transmitted in an electronic format.</u> 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.)</i>

[Nonretroactive as of January 1, 1995]

(Table Added 2006) (Amended 2016 and 20XX)4 **Previous Status:**

5 New Proposal

6 **Regional Associations' Comments:**7 WWMA 2025 Annual Meeting:

8 During the WWMA 2025 Annual Conference the following comments were received:

9 Mr. Loren Minich (NIST Office of Weights and Measures): NIST OWM has not had time to evaluate this block of items
 10 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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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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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,

1 An event logger is required in the device; it must include an event counter (000 to 999), the parameter ID, the date
2 and time of the change, and the new value of the parameter. The event logger information ~~shall~~ may be available at
3 ~~the time of inspection either as a printed copy or in electronic format, provided electronically in lieu of or in addition~~
4 ~~to a hard copy at the time of inspection, provided the event logger information is retained in the system for future~~
5 ~~reference. The information may be printed by the device, printed by another on-site device, or transmitted~~
6 ~~electronically.~~ The event logger shall have a capacity to retain records equal to 10 times the number of sealable
7 parameters in the device, but not more than 1000 records are required. (Note: Does not require 1000 changes to be
8 stored for each parameter.)

9 **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.,**
10 **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,**
11 **3.4.1 NUEMS Table S.2.2.**

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14 ~~demand through the device or through another on-site device. The information may also be available electronically.~~
15 The event logger information may be provided electronically in lieu of or in addition to a hard copy at the time of
16 inspection, provided the event logger information is retained in the system for future reference. The event logger
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18 more than 1000 records are required. (**Note:** Does not require 1000 changes to be stored for each parameter.)

19 **3.40 EVFS Table S.3.3.,**

20 An event logger is required in the device; it must include an event counter (000 to 999), the parameter ID, the date
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22 electronically in lieu of or in addition to a hard copy at the time of inspection, provided the event logger information
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24 times the number of sealable parameters in the ~~EVSE~~ device, but not more than 1000 records are required. (**Note:**
25 Does not require 1000 changes to be stored for each parameter.)

26 NEWMA 2025 Interim Meeting:

27 The committee recommends a developing status for this item.

28 SWMA 2025 Annual Meeting:

29 The committee recommends voting status for this item.

B3: HGM-26.2 V 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	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.~~ <u>The event logger information shall be available at the time of inspection either as a printed copy or transmitted in an electronic format.</u> 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.)

(Amended 2016 and 20XX)

Previous Status:

New Proposal

Regional Associations' Comments:

WWMA 2025 Annual Meeting:

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S&T 2026 Annual Meeting Agenda

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CWMA 2025 Interim Meeting:

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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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3.40 EVFS Table S.3.3.,

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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.

1 **B3: EVF-26.3 V Table S.3.3. Categories of Device and Methods of Sealing**2 **Item under Consideration:**

3 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.)

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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.
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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. The event logger information ~~shall may be provided electronically in lieu of or in addition to a hard copy available~~ at the time of inspection <u>either as a printed copy or transmitted in an electronic format provided the event logger information is retained in the system for future reference</u> . 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.)

(Amended 2016 and 20XX)

Previous Status:

New Proposal

Regional Associations' Comments:

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S&T 2026 Annual Meeting Agenda

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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.

1 **B3: EMS-26.2 V Table S.2.2. Categories of Device and Methods of Sealing**2 **Item under Consideration:**

3 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	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.
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 or shall not accumulate kWh 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. <u>The event logger information shall be available at the time of inspection either as a printed copy or transmitted in an electronic format.</u> 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.)

B3: MDM-26.2 V Table S.2.2. Categories of Device and Methods of Sealing

Item under Consideration:

Amend NIST Handbook 44 Multiple Dimension Measuring Devices Systems Code as follows:

Table S.1.11. Categories of Devices and Methods of Sealing for Multiple Dimension Measuring Systems	
Categories of Devices	Methods of Sealing
Category 1: No remote configuration.	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. Device shall clearly indicate that it is in the remote configuration mode and record such message if capable of printing in this mode.	The hardware enabling access for remote communication must be at the device and sealed using a physical seal or two event counters: one for calibration parameters and one for configuration parameters.
Category 3: Remote configuration capability access may be unlimited or controlled through a software switch (e.g., password).	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.~~ <u>The event logger information shall be available at the time of inspection either as a printed copy or transmitted in an electronic format.</u> 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

Comments in Favor:

Regulatory:

2026 Interim: A representative from New Jersey Weights & Measures, did not support language as published, but supports NIST language. The representative suggested downgrading to developing if there are too many questions around the new language.

2026 Interim: A representative from LA County Agricultural Commissioner/Weights & Measures, originally opposed the item as published, but now is supportive of language in NIST analysis.

2026 Interim: A representative from California Division of Measurement Standards, supports the item overall, NIST analysis language, and list of codes identified by SMA.

Industry:

2026 Interim: A representative from Endress + Hauser Flow USA, Inc., Submitted changes based on EV code. This item should be a mandated requirement instead of permissive, and that information needs to be available at the time of inspection. They would also like the body to consider the language submitted by NIST. Supports voting status and it can be downgraded if necessary.

S&T 2026 Annual Meeting Agenda

2026 Interim: A representative from Scale Manufactures Association, Supports this as a voting item with additional comments in pub 15. The association wants consistency across all scale related codes.
2026 Interim: A representative from Gilbarco Inc, Supports Endress + Hauser Flow USA, Inc. and NIST proposal. Gilbarco is in favor of harmonization with NIST changes. The representative also questions the intent of the item being retroactive or nonretroactive. They support a nonretroactive version of the item.

Advisory:

2026 Interim: A representative from NIST provided a comparison table for a greater understanding of the overall proposal. Supports consistency throughout the item, and stated the item may need downgrading if there are too many questions so the body may review the most updated language. This item should remain nonretroactive as stated in the proposal.

Comments Against:

Regulatory:

- 2026 Interim: None

Industry:

- 2026 Interim: None

Advisory:

- 2026 Interim: None

Neutral Comments:

Regulatory:

- 2026 Interim: None

Industry:

- 2026 Interim: None

Advisory:

- 2026 Interim: None

Item Development:

2026 Interim Meeting: The committee accepted the revisions to all applicable tables as presented by the submitter of the item. The committee has assigned a Voting status to this item based on comments heard during the open hearing.

The Committee noted that the item was incorrectly identified in Publication 15 at the NCWM 2026 Interim Meeting. The item was corrected from HGM-26.1 to HGM-26.2

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:

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 V Handbook 44 Main Table of Contents

Item under Consideration:

Amend NIST Handbook 44 Main Table of Contents as follows:

Main Table of Contents

Section 3.

3.30.	Liquid-Measuring Devices	3-3
3.31.	Vehicle-Tank Meters	3-29
3.32.	Liquefied Petroleum Gas and Anhydrous Ammonia Liquid-Measuring Devices	3-45
3.33.	Hydrocarbon Gas Vapor-Measuring Devices	3-63
3.34.	Cryogenic Liquid-Measuring Devices	3-75
3.35.	Milk Meters	3-87
3.36.	Water Meters	3-97
3.37.	Mass Flow Meters	3-107
3.38.	Carbon Dioxide Liquid-Measuring Devices	3-123
3.39.	Hydrogen Gas-Measuring Devices.....	3-139
3.40.	Electric Vehicle ~~Fueling Systems~~ <u>Supply Equipment</u>	3-151
3.41.	Non-Utility Electricity-Measuring Systems – Tentative Code	3-165

Previous Status:

2026: New Proposal

OTH-26.4 V Section 3 Table of Contents

Item under Consideration:

Amend NIST Handbook 44 Section 3 Table of Contents as follows:

Section 3

Table of Contents

	Page
3.30. Liquid-Measuring Devices	3-3
3.31. Vehicle-Tank Meters	3-29
3.32. LPG and Anhydrous Ammonia Liquid-Measuring Devices.....	3-45
3.33. Hydrocarbon Gas Vapor-Measuring Devices	3-63
3.34. Cryogenic Liquid-Measuring Devices	3-75
3.35. Milk Meters	3-87
3.36. Water Meters	3-97
3.37. Mass Flow Meters.....	3-107
3.38. Carbon Dioxide Liquid-Measuring Devices.....	3-123
3.39. Hydrogen Gas-Measuring Devices	3-139
3.40. Electric Vehicle ~~Fueling Systems~~ <u>Supply Equipment</u>	3-151

3.41. Non-Utility Electricity-Measuring Systems – Tentative Code 3-165

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 V 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

	Page
Section 3.40. Electric Vehicle ~~Fueling Systems~~ <u>Supply Equipment</u>	3-153

...

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-26.3 V A. Application

Item was improperly identified in NCWM Publication 15, January 2026, as EMS-26.1

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 used for the measurement of electricity dispensed in vehicle fuel applications. (See 3.40. Electric Vehicle ~~Fueling Systems~~ Supply Equipment Code).

(d) Transactions not subject to weights and measures authority.

Previous Status:

2026: New Proposal

TIM-26.2 V S.1.4. Recorded Representations

Item was improperly identified in NCWM Publication 15, January 2026, as TIM-26.1

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:

2026 Interim: A representative from Orange County Weights & Measures supports a voting status.

2026 Interim: A representative from LA County Agricultural Commissioner/Weights & Measures stated 26.4 should be underlined.

2026 Interim: A representative from California Division of Measurement Standards supports a voting status.

Industry:

- 2026 Interim: None

Advisory:

- 2026 Interim: A representative from NIST, Supports with one change in A2 part c see NIST analysis

Comments Against:

Regulatory:

- 2026 Interim: None

Industry:

- 2026 Interim: None

S&T 2026 Annual Meeting Agenda

Advisory:

- 2026 Interim: None

Neutral Comments:

Regulatory:

- 2026 Interim: None

Industry:

- 2026 Interim: None

Advisory:

- 2026 Interim: None

Item Development:

2026 Interim Meeting: The committee has assigned a voting status to this item based on comments heard during the open hearing.

The Committee noted that the item was incorrectly identified in Publication 15 at the NCWM 2026 Interim Meeting. The items corrected were EMS-26.1 to EMS-26.3 and TIM-26.1 to TIM-26.2.

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

Professional Development Committee (PDC) 2026 Annual Meeting Agenda

Scott Wagner, Committee Chair
Colorado

INTRODUCTION

This is the agenda of the Professional Development Committee (hereinafter referred to as the “Committee”) for the 111th Annual Meeting of the National Council on Weights and Measures (NCWM). This report is based on the Interim Report offered in the NCWM Publication 16, testimony heard at public hearings, comments received from the regional weights and measures associations and other parties, the addendum sheets issued at the Annual Meeting, and actions taken by the membership at the voting session of the Annual Meeting. The Informational items presented below were adopted as presented when the Board’s report was approved.

Table A identifies the agenda and appendix items. Agenda items are identified in the Report by Reference Key Number, Item Title, and Page Number. Item numbers are those assigned in the Interim Meeting agenda. A Voting item is indicated with a “V” after the item number. An item marked with an “I” after the reference key number is an Informational item. An item marked with a “D” after the reference key number is a Developing item. The developing designation indicates an item has merit; however, the item was returned to the submitter for further development before any action can be taken at the national level. An agenda “Item Under Consideration” is a statement of proposal and not necessarily a recommendation of the BOD. Suggested revisions are shown in **bold** face print by **striking out** information to be deleted and **underlining** information to be added. Table B lists the results of any Voting Items.

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.

Some Voting Items are considered individually; others may be grouped in a consent calendar. Consent calendar items are Voting Items that the Board has assembled as a single Voting Item during their deliberation after the Open Hearings, assuming that the items are without opposition and will not require discussion. The Voting Items that have been grouped into consent calendar items will be listed on the addendum sheets. Prior to adoption of the consent calendar, the Board will remove specific items from the consent calendar upon request to be discussed and voted upon individually.

The Board may change the status designation of agenda items (Developing, Informational, Assigned, Voting and Withdrawn) up until the report is adopted, except those items which are marked Developing, Informational, Assigned or Withdrawn cannot be changed to Voting Status. Any change from the Board Interim Report (as contained in this publication) or from what appears on the addendum sheets will be explained to the attendees prior to a motion and will be acted upon by the active members of NCWM prior to calling for the vote.

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, presentation and data may have been submitted for consideration with this item. Please refer to <https://www.ncwm.com/publication-16> to review these documents.

All sessions are open to registered meeting attendees. 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) the Chairman or, in his 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 desk. If possible, the posting will be made at least a day before the planned closed session.

Subject Series List

Education	EDU Series
Program Management	PMT Series
Other Items	OTH Series

Table A
Table of Contents

Reference Key	Title of Item	PDC Page
EDU – EDUCATION		335
EDU-1	I Professional Certification Program	335
EDU-2	I Training	339
EDU-3	I Instructor Improvement	340
EDU-4	I Recommended Topics for Conference Training	342
PMT – PROGRAM MANAGEMENT		344
PMT-1	I Safety Awareness	344
PMT-2	I Fraud Prevention and Education Task Group	346
PMT-3	Metrology Subcommittee	347

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.

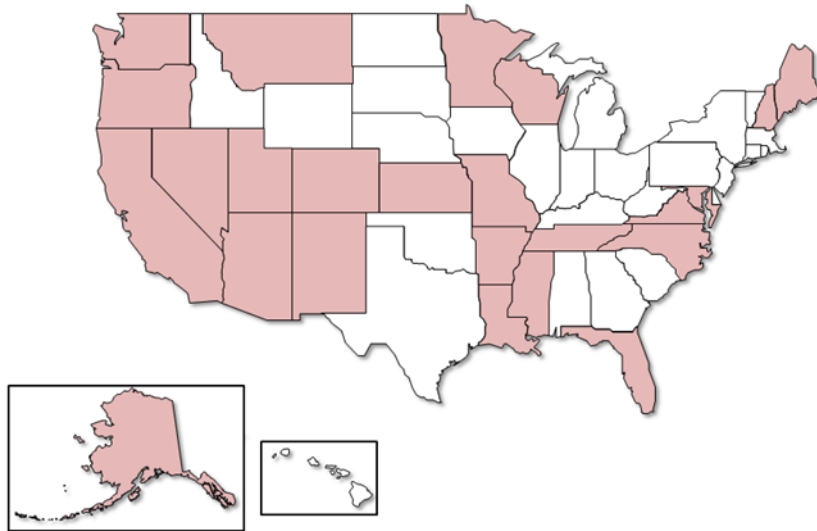
NCWM initiated a Registered Service Agent (RSA) testing program in 2024. The program was established to provide testing for RSAs that could be used to meet regulatory licensing and registration requirements across the United States. The exams would greatly reduce travel and out-of-service times for the RSAs. The NCWM programs also relieve states of the burden of maintaining a testing program. As of January 2026, 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 Electric Vehicle Fueling Systems (EVSE). NCWM is also hosting the following state-specific exams: Nebraska, Ohio, Wisconsin, Minnesota, and New Hampshire.

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 [Gauge Test Taker Walkthrough](#). In-person proctoring is available through the state programs. The policy on proctoring 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

The map below shows the states that have proctors available as of September 2025. For more details visit the [NCWM website](#).

Distribution of Certified Proctors:
Basic, Professional Certification, and RSA Exams
Updated: September 2025



The table below shows the number of virtual and in-person proctored exams completed in FY 25.

	In-person	Virtual
Professional Certification	154	37
Basic Competency Certification	33	5
Registered Service Agents	19	38

Status of Current Tests

The NCWM has issued 1588 professional certificates since program inception through September 30, 2025. Of the certificates issued, fifteen have been issued to individuals in the private sector.

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 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	FY 24-25
Certificates Awarded	140	142	257	53	56	60	56	80	158	83
Cumulative	643	785	1042	1095	1151	1211	1267	1347	1505	1588

- 1 The table below shows the states using the professional certification program and the number of certificates earned
 2 since program inception including expired certificates. The Committee applauds these states and encourages increased
 3 use of the certification program.

State	Certificates	State	Certificates	State	Certificates
Minnesota	233	Nevada	32	Vermont	9
Louisiana	201	Montana	29	Wyoming	7
Missouri	143	Maine	27	Delaware	6
Wisconsin	103	New Mexico	26	Alabama	4
Maryland	99	Colorado	19	Michigan	3
Virginia	86	New York	19	South Dakota	3
Alaska	65	Connecticut	15	Utah	2
North Carolina	57	Private	15	New Jersey	2
Mississippi	56	Ohio	14	Oregon	2
Washington	51	Indiana	13	Tennessee	2
Kansas	49	Massachusetts	12	Florida	1
Arizona	44	Idaho	11	Iowa	1
California	41	Arkansas	10	New Hampshire	1
Nebraska	33	Pennsylvania	10	West Virginia	1

4 NCWM Basic Competency Certificates

- 5 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	FY 24-25	Cumulative
Basic - Measuring	0	40	14	5	7	3	4	6	69
Basic - Weighing	1	30	11	12	9	2	4	7	73
Total Awarded	1	70	25	17	16	5	8	13	142

- 6 The table below shows those states with individuals holding a basic competency certificate. The Committee applauds
 7 these states and encourages increased use of the certification program nationwide

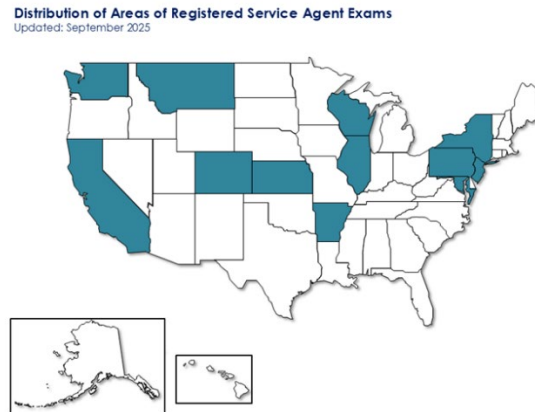
8

State	Certificates	State	Certificates
Louisiana	69	Arkansas	2
Tennessee	42	Nevada	2
Montana	16	Kansas	1
Alaska	7	Nebraska	1
Colorado	5	Private	1
Florida	3		

1 **NCWM RSA Certificates**

2 NCWM awarded 29 RSA certificates during FY 24-25.

The map below shows the states where an RSA exam was awarded.



3 The table below shows the number of RSA tests attempted and certificates awarded in FY 25.

	Small Capacity	Large Capacity	RMFD	VTM	LPG	Handbook 44	EVSE	Totals
Attempted	6	4	5	12	9	11	10	57
Awarded	1	1	2	6	3	10	6	29

5 **NCWM Meeting Comments:**

6 2026 Interim Meeting: Jerry Buendel (Washington - Retired), Professional Certification Program Coordinator, gave
 7 an update of the professional certification program. Mr. Buendel presented an update on the certification program and
 8 spoke about new Registered Service Agent (RSA) exams that are available. Scott Wagner, Colorado, thanked
 9 everyone for working on exams, encouraged other states to participate, and shared how Colorado operates the program.
 10 Scott mentioned that the cost of the program is minimal for service companies and accepted by multiple states. Kristin
 11 Walter, Arkansas, thanked everyone for their work. She has been tasked with finding a good training program for her
 12 staff and is thankful to have the modules available through NCWM. She mentioned the statements and objectives
 13 could be complex and take time to research. Matt Douglas, California, supports the program and is not deterred by the
 14 failure rate, the exams were not meant to be easy. They are qualified standards of professionalism. Alison Wilkinson,
 15 Maryland, Echoed the comments already heard.

16 Alison shared how Maryland's program is run. In addition to twice a year exam, RSA's must sign an agreement stating
 17 that they understand Maryland laws. Maryland also uses the professional exams for staff development. Jason Flint,
 18 New Jersey, stated they would like to use the NCWM RSA exams in New Jersey and are looking towards industry for
 19 legislative support. Robbie Parke, Washington, commended Jerry for his work. Robbie suggested CEP courses for
 20 experienced inspectors to know how to handle new codes and how they impact inspections. Don Onwiler, NCWM,
 21 shared that when he took the exams, he passed the first time because he understood the handbooks. Don also shared
 22 where to find the RSA list on the NCWM website and said the intention is to have one set of tests to cover multiple
 23 states.

24 **Regional Association Comments:**

25 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 classification 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. The NIST OWM PDC Liaison will regularly provide updates to the Committee on OWM's training resources and activities. Details of these updates can be found below and in prior Committee reports. **NCWM Meeting Comments:**

2026 Interim Meeting: Dave Sefcik, NIST OWM shared where NIST training is on their website and information on the changes and upcoming EPO's.

- EVSE Comprehensive Metrology Training program is in development. NIST OWM expects the training materials to be ready by the end of summer and the course to be fully developed in a year.
- Information Hours continue to be successful and popular. Seven sessions are planned for 2026. The dates for the Info Hours sessions will be announced in February.
- EPO updates are still in progress. They estimate the updates will be complete by the end of April and plan to publish an updated version of NIST Handbook 112 by the end of May. The publication will feature new EPOs for Weigh-In-Motion, Grain Moisture Meters, and an annex to EPO 28 for guidance and selection of reference scales used in CNG testing.
- NIST OWM conducted a Loading Rack Meter/Vehicle Tank Meter Training in June 2025. The training was a hybrid format, with some of the training taking place via webinar and the in-person field training taking place in Springfield, IL.

- 1 • NIST OWM will conduct a Large Scale Field Training in 2026. Training will be a hybrid model with some
- 2 training taking place via webinar. Dates and location of field training TBD.
- 3 • NIST provides National and Regional Short Course Training Seminars. Those interested are encouraged to
- 4 please reach out to the OWM.
- 5 • NIST will continue to develop E-Learning Resources for their website.

6 David Sefcik acknowledged NLMP team for their work impacted by the government shutdown. Jason Flint, New
7 Jersey, asked if the EPO's will be updated after the changes, and Dave stated yes. Joanna Cartee, Georgia, asked if
8 there is a separate website for webinars or if they are all on NCWM. Dave stated yes NIST training is separate and
9 located on NIST website. Matt Douglas, California, thanked everyone and for always being there to assist. Scott
10 Wagner, Colorado, asked if large scales were offered hybrid training and Dave responded yes, they are trying to move
11 to a hybrid model. Loren Minnich, NIST is working with Jason Glass, Kentucky, on organizing a large-scale training
12 and video. The goal is to continue recording and post their webinars and to have them available for reference. Don
13 Onweiler, NCWM showed where the link is on the website. John McGuire, NIST highlighted information hours. Scott
14 Wagner, Colorado, encourages everyone to take advantage of their webinars. Mahesh Albuquerque, Colorado, Chair
15 of the EVSE Planning Committee, provided EVSE training updates. The 2025 training in Denver was at full capacity,
16 and he is looking forward to the 2026 training in Garden Grove California. He thanked the committee for their work
17 and encouraged members to visit the website to sign up for training.

18 **Regional Association Comments:**

19 WWMA 2025 Annual Meeting:

20 Jose Arriaga, Orange County CA, Thanks to NCWM for EVSE training, he received positive feedback from his staff
21 who attended. Recommend training for e-commerce oversight and application of e-commerce regulations and
22 enforcement.

23 Kurt Floren, LA County CA, Also supports e-commerce training, we need uniformity in application across all
24 jurisdictions. Question on EVSE training, is it a good model to have regulators and Service Agents combined in the
25 same training?

26 Matt Douglas CA CDFA, Supports e-commerce training, uniform messaging is critical for e-commerce. Additional
27 support may be required to identify responsible parties.

28 Aaron Yanker CO, Regarding RSAs and Regulators in the EVSE training is beneficial for building collaboration
29 through joint attendance, but recognizes challenges with combined training.

30 Mahesh Albuquerque, CO, Appreciates the comments, the committee's conducted a post training recap. Training was
31 mostly W&M officials with approximately 10 RSA's. The RSAs did not perform as well as the regulators on their
32 exam. RSA prep work was recommended, not required for participation.

33 Kurt Floren LA County, Asks if there should be an RSA specific format for training?

34 Mahesh Albuquerque, CO, There may be value in separate training for RSAs

35 Miland Kofford, UT, He attended the training and stated the interaction and collaboration between the RSAs and
36 regulators was good. Application and interpretation is different between the two and likes the idea of break-out
37 sessions for RSAs and regulators.

38 Mal Skowron, Tesla, Very useful to have interaction and hear firsthand on challenges. The dialog between RSAs and
39 regulators is very valuable and supports the combined training. Her attending EVSE training, she has now identified
40 what level technician to send to subsequent EVSE training.

41 Khoa Lam, LA County, Attended the EVSE training. EVSE industry will continue to grow and the number of RSA's
42 will increase. Khoa stated that RSAs have specific needs and resource constraints. Suggested methodology for
43 designing future training to incorporate distinct sessions for RSAs and regulators. Recommended recording training
44 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 classification for this item.

CWMA 2025 Interim Meeting:

Loren Minnich (NIST OWM)

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 Virginia wanted to stress the PDC become more involved aligning with the agenda of NCWM Chairman Kevin Schnepf. 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 training employees 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.

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:

2026 Interim Meeting: Alison Wilkinson, Maryland, asked if there was a way NCWM could recognize subject matter experts who are willing to assist with training in the regions. Chris Wagoner, 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, are free resources, and are accredited programs. Some information is LPG specific content that can be adapted and focuses on how to educate. NPGA identified a problem with seasoned employees conducting training; they are not educators and struggle with how to educate. The courses are all online and they can provide a link on NCWM website. Scott Wagner, Colorado, suggests a mentoring program within NCWM for meeting attendees to take home to staff.

Regional Association Comments:

WWMA 2025 Annual Meeting:

Bill Striejewski, 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 commentators. 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 classification 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 2017, which 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:

2026 Interim Meeting: No comments

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 classification 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.

The Safety Program Toolbox is there to help your organization create or improve your current safety program. The

1 toolbox is posted on the NCWM website at www.ncwm.com/safety. The Safety Subcommittee will assume
2 responsibility for:

- 3 • Maintaining and updating the safety toolkit.
- 4 • Writing and deploying the NCWM annual safety survey, as well as reporting on the results each year.
- 5 • Finding resources and/or developing weights-and-measures-focused materials relating to the top hazards
6 identified through the safety survey or through developing the toolkit.
- 7 • Building a safety culture and developing safety leadership within the NCWM through participation on the
8 Safety Subcommittee
- 9 • Maintain the annual safety survey

10 The Committee expresses appreciation to the members of the Safety Subcommittee for their willingness to volunteer
11 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

12 The NCWM safety page houses the list of regional safety liaisons and an archive of past safety articles.

13 **Regional Safety Liaisons:**

14 **Central Weights and Measures Association (CWMA)**

15 Mr. John Bell, Missouri Department of Agriculture

16 **Northeastern Weights and Measures Association (NEWMA)**

17 Mr. Michael Peeler, New Jersey Weights and Measures

18 **Southern Weights and Measures Association (SWMA)**

19 Mr. Christopher Wagner, National Propane Gas Association

20 **Western Weights and Measures Association (WWMA)**

21 Mr. David Fraser, Montana Weights & Measures

22 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 2026)	NEWMA	April 15, 2026
Issue 3 (September 2026)	CWMA	August 13, 2026
Issue 1 (February 2027)	WWMA	January 15, 2027
Issue 2 (May 2027)	SWMA	April 15, 2027

23 **NCWM Meeting Comments:**

24 20265 Interim Meeting: Christopher Wagner of the National Propane Gas Association shared the committee updates

and invited all to attend. The Safety Subcommittee has started meeting monthly to remain on target for the subcommittee goals. He encouraged anyone interested in participating to please contact John Satterlee. The subcommittee will revive the safety surveys. Past surveys were difficult and time-consuming, resulting in limited participation. The subcommittee has revised the survey to a simpler format that will take less time and hopefully result in increased participation. Mr. Wagner expressed the effectiveness of safety surveys, explaining that the data collected will generate future articles and resources by the committee. The survey will be sent out to the state directors in two to three weeks. He asked that the jurisdictions make sure their directors are on the email list.

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 classification 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 VTOL. 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 of 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 regulators, 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 industry and select topics to develop into a presentation to be given as needed during the NCWM Annual Meeting.

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:

2026 Interim Meeting: Alan Walker (Florida), FPETG Chair, provided an update to membership. Alan shared the concerns with skimmers and pulsers. This group is seeking members.

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 classification 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.

1 The committee recommends this item remain informational.

2 SWMA 2025 Annual Meeting:

3 No comment.

4 The committee recommends this as an informational item.

5 **PMT-3 Metrology Subcommittee**

6 The Metrology Subcommittee was formed in 2024. The mission is to recognize, advocate, and promote better
7 integration between field weights and measures and metrology. The subcommittee's primary focus is metrological
8 progress and aimed at strengthening communication, training, and support across the legal metrology community as
9 well as the following four initiatives:

10

- 11 1. Create a standard form that will be used to submit proposed changes to NIST SOPs and Handbook 105
12 series documents. This form is intended to streamline the feedback process and ensure that suggestions
13 from the labs are formally documented and submitted in a consistent, structured manner.
- 14 2. Develop an On-the-Job Training (OJT) framework that will serve as the foundation for a broader OJT
15 resource library. This library will feature SME developed training modules to support new metrologists and
16 assist labs in standardizing their training approaches across regions.
- 17 3. Create a training resource geared toward directors and administrators who may not have a metrology
18 background. The goal is to provide them with a better understanding of metrology lab operations, including
19 staffing, standards, maintenance, and compliance requirements, so they can better support their teams.
- 20 4. Create a mentorship framework to facilitate training between labs.
21

22 The Metrology Subcommittee will actively solicit topics from membership and industry, and select topics to develop
23 into a presentation to be given as needed during the NCWM Annual Meetings.

24 **NCWM Meeting Comments:**

25 2026 Interim Meeting

26 Frank Greene, Connecticut, Chair, they are looking to educate folks. He stated they are looking to promote smaller
27 metrology labs for succession planning, training, and maintenance, specifically to educate program directors on the
28 metrology lab. Frank also mentioned a mentor program for new metrology people. Lisa Corn, Texas, Co-Chair, stated
29 they are accepting suggestions on training for the field and support staff.

30 **Regional Association Comments:**

31 WWMA 2025 Annual Meeting:

32 No comments were heard. The committee looks forward to reading ongoing discussion from other regional association
33 meetings.

34 The committee recommends an informational classification for this item.

35 CWMA 2025 Interim Meeting:

36 No comments.

37 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 classification for this item.

SWMA 2025 Annual Meeting:

No comment.

The committee recommends this as an informational item.

Women in Weights and Measures

Cheryl Ayer, New Hampshire, Chair stated the NCWM session on “Building a Satisfying Life” was a success and encourages all to attend future sessions.

MEMS

Brain Fuller, Iowa, Chair committee holds monthly meetings on mentorship and new member orientation. They have created a new member brochure. They are currently working on creating a FAQ document and other educational materials for new members.

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

National Type Evaluation Program (NTEP) Committee 2026 Annual Meeting Agenda

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

International.....	INT Series
Activity Reports.....	ACT Series
Conformity Assessment Program.....	CAP Series
NCWM Publication 14, Administrative Policy.....	ADM Series
Other Items	OTH Series

Table A
Table of Contents

Reference Key	Title of Item	NTEP Page
INT – INTERNATIONAL.....		353
INT-1 I	Mutual Recognition Arrangement (MRA).....	353
INT-2 I	OIML-Certification System (CS)	354
ACT – ACTIVITY REPORTS		354
ACT-1 I	NTEP Participating Laboratories and Evaluations Reports	354
ACT-2 I	NTEP Sector Reports	355
CAP – CONFORMITY ASSESSMENT PROGRAM		356
CAP-1 I	Conformity Assessment Program	356
ADM – NCWM PUBLICATION 14, ADMINISTRATIVE POLICY.....		358
ADM-23.1 W	Acceptance of OIML-CS Test Reports Issued for Devices Evaluated to the OIML R117 Recommendation for Issuing NTEP Certificates of Conformance.	358
ADM-24.2	Implement Software Version Change Policy.....	361
ADM-25.1 I	Addition of Water Meters to the Verified Conformity Assessment Program.....	364
OTH – OTHER, A PLACE TO CAPTURE NON-TECHNICAL COMMENTS OR SUGGESTIONS INTENDED TO IMPROVE THE NATIONAL TYPE EVALUATION PROGRAM.....		366

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 July 20, 2021, NCWM Chair Hal Prince and Measurement Canada Acting President Nathalie Campeau 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 13 000 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).

With Dr. Ehrlich retirement Katya Delak has taken his role as the Program Leader for International Legal Metrology at NIST OWM with Isabel Chavez Baucom taking the role of the OIML Management Committee contact.

Information regarding the OIML-CS can be found at www.oiml.org. Katya Delak and Isabel Chavez Baucom represent 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 Sector:

The NTEP Weighing Sector met on August 19-20, 2025, Refer to the Sectors web page for a copy of the meeting summary. The next meeting is scheduled for August 18th and 19th. 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

Ms. Jessica Ferree
Metter-Toledo, LLC
jessica.ferree@mt.com

NTEP Administrator

Mr. Jeff Gibson
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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

Mr. Jimmy Williams
Missouri
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NTEP Administrator

Mr. Jeff Gibson
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NTEP Measuring Sector:

The Measuring Sector met on September 16-17, 2025 refer to the Sectors web page for a copy of the meeting summary. 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

Mr. Brent Price
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NTEP Administrator

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NTEP Software Sector:

A joint meeting of the Software and the Weighing Sector was held on August 20 - 21, 2025 refer to the Sectors web page for a copy of the meeting summary. 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

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NTEP Administrator

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NTEP Multiple Dimension Measuring Devices (MDMD) Work Group:

The NTEP MDMD Work Group meeting was held on May 7th, 2025 refer to the Sectors web page for a copy of the meeting summary. 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

Mr. Chris Senneff
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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

Mr. Andrei Moldoveanu
NEMA

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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 random on-site 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 W 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.

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

NTEP 2026 Annual Meeting Agenda

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.

NCWM 2026 INTERIM MEETING: Jim Petalano – Guidant Measurement. Encourages committee to allow OIML certificates to be considered as part of the NTEP process.

Alison Wlkinson – MD; Different regulators would accept different things. If OIML is accepted, then unify what is accepted and expected to be evaluated. Before deciding, committee should consider what data is going to be accepted.

John Hathaway – Murray Equipment: Strongly against this item. NTEP evaluators can travel to OIML sites to observe testing rather than just accepting data.

Michael Keilty – Endress + Hauser; Didn’t think NTEP would ever allow certification based solely on OIML certificate but rather look at the data and expand the NTEP certificate. It would be beneficial to ask NTEP to evaluate data from OIML for larger unique devices.

Jim Pettinato – allow OIML certs

Allison Wilkinson, Maryland - Unify what would be accepted. BOD should have data on what would be accepted.

John Hathaway, Murry Equip strongly against this item. NTEP may travel to OIML sites to observe testing and not just accept certs.

Michael Kelty, Endress + Hauser Flow USA – Never thought NTEP would issue a cert based on OIML certs. Though NTEP would look at the data.

Jim Pettinato from Guidant: Encourage NTEP to be a utilizer.

Alison Wilkinson from MD: discussed in measurement sector. Different reps had diff understanding on what to accept. Should unify exactly what is accepted to issue a certificate.

John Hathaway from Murray Equip: strongly against and encourages NTEP to not adopt. NTEP evaluators can travel to OIML sites to observe testing. Better way to move ahead with evaluations instead of accepting certificate data.

Michael Keilty from Endress Hauser: didn't understand expectations, never thought that NTEP would sole issue a certificate based on OIML test report fully. He thought they would be able to look at data and the data would lead to expansion of the certificate to give a basis. EX: flow meters, very difficult to find lab that will test a 12" meter that s running a lot of products. Small er meters are good in the US. It is valuable to ask NTEP to review the data. Disconnect: should NTEP be required to take the whole test report to issue a certificate.

Jim Pettrinato Guidant Measurement Supports adoption, MD should consider what this will do, John Hathaway Murray Equipment strongly against proposal do not adopt, Michael Kelity Enderson Hauser assumed NTEP would look at data before issuing CC supports item,

This item was recommended by the NTEP Committee to move to the NCWM BOD for a vote during the 2026 Spring Board of Directors/NTEP Committee meeting the item was rejected and has been withdrawn.

ADM-24.2 W 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.

Dmitri 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: Dmitri 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.

- 1 **NCWM 2025 Annual Meeting:** Michael Keilty – Endress + Hauser – Supports the concept but NTEP might want to
2 consider the program used in Canada. A simple change could be a letter which would be adequate to address this and
3 should be offered at a reasonable cost.
- 4 Justin Wilson ChargePoint. Neutral. Concerns about implementation. Suggests a delayed implementation for
5 manufacturers to prepare. Field devices have a wide variety of software environments. Need a process to make
6 software modifications without a full CoC review again.
- 7 Alison Wilkinson Strongly support this item. Have found multiple flaws in software where metrological changes are
8 occurring. New models are being introduced without review. Urge other states to review CoCs more closely has seen
9 multiple problems. We should all be ensuring that devices are complying.
- 10 Matt Douglas. Supports comments from MD. Need to identify portion of software code (version number) that is
11 allowed to increase without creating a sealable event or need to update certificate.
12
- 13 **NCWM 2026 Interim Meeting:** Jim Pettinato – Software sector chair: This is a reasonable thing to implement.
14 Shouldn't be software updates that affect things. Need clarity on what the difference is going to be regarding firmware
15 updates versus hardware updates.
- 16 Alison Wilkinson – MD; MD is vigilant with reviewing software to ensure no metrological changes have been
17 made. With different units of measurements, what they found is that the first number has incremented. They
18 experience pushback from manufacturers when discussing software updates. This is an issue in the field. The
19 metrological parameter version number should be the first number, and any additional following number increases
20 would not require reevaluation by NTEP. Companies are making changes without notifying NTEP. Move forward
21 with this item. Supports.
- 22 John Hathaway – Murray Equipment: Understands the desire and supports this item. What will NTEP and inspectors
23 be looking for? Wants to see some details in writing, such as which number can be changed with software versions.
- 24 Brent Price – Gilbarco: Curious about fees and when it would be implemented.
- 25 Matt Douglas – CA: Agrees w/ MD. Inspectors need to be able to verify that version numbers on devices are
26 compliant with the existing NTEP certificate. Has seen many variations of version number formats. Makes it
27 difficult for inspectors.
- 28 Michael Keilty – Endress + Hauser: Supports and wants the committee to look at Measurement Canada as a model.
- 29 Jim Pettinato, Software Sector Chair – was discussed at Sector. Understand issues. Need clarity on differences on
30 evaluations.
- 31 Allison Wilkinson, Maryland – Some inspectors are more vigilant on inspecting software versions. Strongly urge to
32 move forward.
- 33 John Hathaway, Murry Equipment - Understand the need. Supports. Looking for guidance on where NTEP will be
34 looking for software versions.
- 35 Brent Price, Gilbarco – When would NTEP anticipate implement change.
- 36 Matt Douglas, California – Agrees with Maryland. Needs to be able to identify software version on NTEP type
37 evaluation.
- 38 Michael Keilty, Endress + Hauser Flow USA – supports software tracking. Fully support item
- 39 Jim Pettinato Software Sector Chair: Consensus that this is a reasonable thing to do. Needs clarity on what the
40 difference is between firmware eval and whole device eval.

NTEP 2026 Annual Meeting Agenda

Alison Wilkinson from MD: MD is vigilant on software on reviewing the version numbers and there are no metrological parameter changes. Certificates say version# "or higher". Found softwares are not traceable to the certificates. Software is are not being NTEP approved. Version 1.x.x.x, get rid of "or higher". First number should be the metrological parameters, the rest of the numbers would be other things. Noticing software changes that do not comport with the certificate. Urge that this go forward.

John Hathaway from Murray Equip: Understands the desire and need, supported by Murray and rest of MMA. Looking for guidance where NTEP and the state inspectors will be looking for the software versions and acceptable formats. Volunteers Murray equipment staff to assist.

Brent Price from Gilbarco: what are the fee structures? NTEP committee will make a decision at the next BOD, implementation after.

Matt Douglass from CA: agree with MD. Inspectors need to be able to identify version numbers and they are covered by the evaluation. Must be clearly expressed. "or higher" is not always clear. Manufacturer had letters and numbers. W at end on the certificate but a C in the middle out in the field.

Michael Keilty from Endress Hauser: fully supports software tracking. Measurement Canada has robust system. ISO has methods. Identification of software is difficult. Metro software isn't separate from other parts of software.

This item was recommended by the NTEP Committee to move to the NCWM BOD for a vote during the 2026 Spring Board of Directors/NTEP Committee meeting the item was accepted and will no longer appear on the report.

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: Dmitri 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.

NTEP 2026 Annual Meeting Agenda

1 Personal experience with testing the meters. Sometimes brand-new shipments don't even meet marking and sealing
2 requirements from NTEP. Lots of problems with brand new, aside from the performance accuracy.

3 John Bell, Ventura County, California. In Support. Water use is critical in California. Water meters have had major
4 issues for ten years. This measure is a good start to address the issues. Worked as an inspector and saw the same
5 problem with water meter failures. CA laws encourage more efficient water use. This can also affect other states. This
6 item is a good start to get more consistency with water meters.

7 Austin Shepard, San Diego County, California. In Support. Echoes statements from other California counties and the
8 State. San Diego County met with water manufacturers and established the same test procedures in the San Diego lab
9 – still seeing high failure rates.

10 **NCWM 2026 Interim Meeting:** Jim Pettinato from Guidant: opposes the item with request to be withdrawn.
11 Questions field testing is sufficient for the devices.

12 Ricardo Barillas from AWWA: requested withdrawal. NO data to investigate with details. See written comments.
13 Michael Keilty from Endress Hauser supports what Ricardo said. Quite surprised that it was under
14 consideration. Not sure immediately going into VCAP, it will solve the problem. It needs to be a group to
15 investigate and provide data.

16 Jose Arrigo from Orange County CA: Data collection is ongoing, but some data is collected in different
17 formats. Would like to have it stay on agenda to do a refined data collection county by county. Want to see if
18 new vs used is an issue. There are certain meters that have high failure rates. Want to really dive into details to
19 find issues.

20 Austin Shepherd from San Diego County CA: echoes Orange County. Hard to have multiple jurisdictions
21 merging data. It's not an industry-wide problem. While checked by util companies, they don't all have the
22 same processes. Submeters only be checked by W&M.

23 Michael Keilty from Endress Hauser: collection of information is collected from saints and sinners so brand
24 identification is important. Matt Douglass from CA: supports OC and SD. Some concerns are not just for
25 accuracy, but also other specifications.

26 **OTH – OTHER, A PLACE TO CAPTURE NON-TECHNICAL COMMENTS OR SUGGESTIONS** 27 **INTENDED TO IMPROVE THE NATIONAL TYPE EVALUATION PROGRAM.**

28 Mr. Marc Paquette, Vermont | Committee Chair
Mr. Jason Flint, New Jersey | Member
Mr. Kevin Schnepf, California | Member
Mr. Daniel Walker, Ohio | Member
Mr. Paul Floyd, Louisiana | Member
Mr. Jeff Gibson, NCWM | NTEP Administrator

National Type Evaluation Program Committee

Nominating (NOM) Committee
2026 Interim Meeting Agenda

Mr. Marc Paquette, Committee Chair
Vermont

INTRODUCTION

The Nominating Committee (hereinafter referred to as the “Committee”) submits its Committee Report for consideration by the National Council on Weights and Measures (NCWM). This report contains the slate of nominees as officers of the corporation.

Table A identifies the agenda items by reference key, title of item, page number, and the appendices by appendix designations.

Table A		
Table of Contents		
Reference Key	Title of Item	NOM Page
NOM - NOMINATIONS.....		369
NOM-25-1 V	Officer Nominations.....	369

Details of All Items
(In order by Reference Key)

NOM - NOMINATIONS

NOM-25-1 V Officer Nominations

Source:

Nominating Committee

Purpose:

Election of NCWM officers.

Item Under Consideration:

The following slate of officers was selected by a unanimous vote of the committee:

Chairman-Elect:

Paul Floyd, Louisiana

Treasurer

Mahesh Albuquerque, Colorado

Board of Directors At-Large (5-year term):

Sherry Turvey, Kansas

Background/Discussion:

The Nominating Committee met during the 2026 Interim Meeting in Mobile, Alabama at which time it nominated the persons listed above to serve as officers of the 111th National Council on Weights and Measures. In selecting nominees from the membership, consideration was given to professional experience, individual qualifications, conference attendance and participation, and other factors deemed important.

Marc Paquette, Vermont | Committee Chair
 Bill Callaway, Owl Services | Member
 Konrad Crockford, North Dakota | Member
 Kurt Floren, Los Angeles County, California | Member
 Valerie Forbes, Delaware | Member
 Frank Greene, Connecticut | Member
 Miland Kofford, Utah | Member

Nominating Committee