



2024

PUBLICATION 15

**INTERIM MEETING
of the
NATIONAL CONFERENCE ON WEIGHTS AND MEASURES**

**NEW ORLEANS, LOUISIANA
JANUARY 7 - 10, 2024**

COMMITTEE AGENDAS FOR THE 2024 INTERIM MEETING

**N C W M
PUBLICATION**

15

**COMMITTEE AGENDAS
FOR THE
2024 INTERIM MEETING**

New Orleans, Louisiana / January 7-10, 2024

Prepared in Cooperation with the National Conference 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.



National Conference on Weights and Measures Overview

National Conference on Weights and Measures (NCWM), Inc. is a standards development organization for weights and measures regulatory agencies of the states, counties, and cities of the United States, as well as for federal agency use. The Annual Meeting brings together government officials and representatives of business, industry, trade associations, and consumer organizations for the purpose of hearing and discussing subjects that relate to the field of weights and measures technology and administration.

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

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

Gene Robertson, NCWM Chairman
Mississippi



Dear NCWM Colleagues,

Welcome to New Orleans, Louisiana “The Big Easy”, located along the Mississippi River. This is the location of the NCWM Interim Meeting on January 7-10, 2024, at the Royal Sonesta New Orleans which opens up to the famed Bourbon Street. You will find many things to do here, museums, music, great food options and much more!

If you are new to the NCWM process, let me give you a brief overview. We will review proposed changes to Handbook 44 on Specifications Tolerances for Weighing and Measuring Devices, Handbook 130 on Model Laws and Regulations, and Handbook 133 on Checking the Net Contents of Packaged Goods. The process started at the four regional meetings that were held in the fall. This is where we begin to make changes to the handbooks by either changing the current language, adding to a section or creating a new section. At this interim meeting, each of our national standing committees will bring forward these items in opening hearings. This is the point where members will have a chance to recommend language, add data and/or reports, and give testimony on the items presented to the conference. After the hearings, the committees will use what was heard during opening hearings to decide on the status of the items for the Annual Meeting in July. This is just a sample of the meeting agenda for the week.

The Interim meeting further provides a forum for regulators, industry representatives and other interested groups to participate in technical sessions, task groups, sub-committees, steering committees, and other committee meetings during the conference to work on issues. Prior to the meeting I ask you to please review Publication 15 and participate in the various meetings and hearings during the week.

On Wednesday we will have a technical session on the NCWM National Price Verification Survey that started this month. I believe this national survey will go a long way in providing unity throughout the Weights and Measures community and provide real value for our stakeholders. I am looking forward to seeing the results of our work and providing the findings to all stakeholders.

I hope you have an opportunity to experience some of the sights and sounds during your visit. New Orleans has a lot to offer, and I personally look forward to finding good things to eat!

I trust that you will find everything to your satisfaction and if not please don't hesitate to ask. Our NCWM team's mission is to make your stay a pleasant one.

Sincerely,

A handwritten signature in black ink that reads "Gene Robertson". The signature is fluid and cursive, with a long horizontal line extending from the end.

Gene Robertson
NCWM Chairman

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Schedule of Events

The schedule of events is tentative and subject to change.

**Committee hearings will occur in the order presented below. Hearing times are not firm; when one Committee finishes, the next Committee will begin.*

All times are Central Standard Time

Sunday, January 7, 2024

8:00 a.m. – 10:00 a.m.	Coffee Service	Arcade Foyer
8:00 a.m. – 5:00 p.m.	Registration and Exhibits	Arcade Foyer
9:00 a.m. - 11:30 a.m.	Cannabis Task Group	Grand Ballroom
9:00 a.m. – 11:30 p.m.	Publication Style Guide Focus Group	Evangeline A
9:00 a.m. – 11:30 a.m.	Metrology Subcommittee Focus Group	Evangeline BC
9:00 a.m. – 11:30 a.m.	PALS: Packaging and Labeling Subcommittee	Regal Suite
9:00 a.m. – 12:00 p.m.	Meter Manufacturers Association	Royal Conti
11:30 a.m. – 1:00 p.m.	Lunch on Your Own	
1:00 p.m. – 3:15 p.m.	Milk Meter Tolerance Task Group	Evangeline A
1:00 p.m. – 3:15 p.m.	FALS: Fuels and Lubricants Subcommittee	Evangeline BC
1:00 p.m. – 3:15 p.m.	CALM: Community for all Legal Metrologists	Regal Suite
1:15 p.m. – 3:15 p.m.	Skimmer Education Task Group	Royal Conti
3:30 p.m. – 4:00 p.m.	Joint Committee Meeting	Grand Ballroom
4:00 p.m. – 5:00 p.m.	Committee Agenda Review	
	Laws and Regulations Committee	Evangeline BC
	Specifications and Tolerances Committee	Regal Suite
	Professional Development Committee	Royal Conti
	Board of Directors / NTEP Committee	Evangeline A
5:30 p.m. – 7:00 p.m.	Chairman's Reception	Courtyard

Schedule of Events

Monday, January 8, 2024		Room
7:30 a.m. – 9:00 a.m.	Light Breakfast	Arcade Foyer
7:30 a.m. – 5:00 p.m.	Registration and Exhibits	Arcade Foyer
8:30 a.m. – 12:00 p.m.	Official Session – Open Hearings Laws and Regulations Committee Specifications and Tolerances Committee Professional Development Committee Board of Directors / NTEP Committee	Grand Ballroom
12:00 p.m. – 1:00 p.m.	Lunch on Your Own	
1:00 p.m. – 5:00 p.m.	Official Session – Open Hearings Continued	Grand Ballroom
Tuesday, January 9, 2024		Room
7:30 a.m. – 9:00 a.m.	Light Breakfast	Arcade Foyer
7:30 a.m. – 5:00 p.m.	Registration and Exhibits	Arcade Foyer
7:30 a.m. – 8:30 a.m.	Associate Membership Committee	Grand Ballroom
8:30 a.m. – 12:00 p.m.	Official Session – Open Hearings Continued	Grand Ballroom
12:00 p.m. – 1:30 p.m.	Lunch on Your Own	
1:30 p.m. – 2:30 p.m.	Board of Directors Q&A	Grand Ballroom
1:30 p.m. – 5:00 p.m.	Committee Work Sessions Laws and Regulations Committee Specifications and Tolerances Committee Professional Development Committee	Evangeline BC Regal Suite Royal Conti
3:00 p.m. – 5:00 p.m.	Women in Weights and Measures 3:00 p.m. – 4:00 p.m. NCWM General Membership 4:00 p.m. – 4:10 p.m. Break 4:10 p.m. – 5:00 p.m. Session continued for women only	Evangeline A

Wednesday, January 10, 2024		Room
7:30 a.m. – 9:00 a.m.	Light Breakfast	Arcade Foyer
7:30 a.m. – 12:00 p.m.	Registration and Exhibits	Arcade Foyer
9:00 a.m. – 10:45 a.m.	Technical Session: NCWM National Price Verification Survey: Marc Paquette, Vermont, and John McGuire, NIST	Grand Ballroom
11:00 a.m. – 12:00 p.m.	Joint Committee Meeting	Grand Ballroom

Schedule of Events

2023-2024 Organization Chart

NCWM Board of Directors

Office	Name	Affiliation	Term Ends
Chairman	Gene Robertson	Mississippi	2024
Chairman-Elect	Marc Paquette	Vermont	2024
Immediate Past Chair	Mahesh Albuquerque	Colorado	2024
Treasurer	Craig VanBuren	Michigan	2026
Active Membership - Western	Kevin Schnepf	California	2027
Active Membership - Southern	Paul Floyd	Louisiana	2028
Active Membership - Northeastern	Jack Walsh	Massachusetts	2024
Active Membership - Central	Daniel Walker	Ohio	2025
At-Large	Ray Johnson	Fairbanks Scales	2028
At-Large	Dr. Matthew Curran	Florida	2026
Associate Membership	Chris Guay	CGGT	2025
Honorary NCWM President	Dr. Laurie Locascio	NIST Director	NA
Executive Director	Don Onwiler	NCWM	NA
Executive Secretary	Dr. Katrice Lippa	NIST, Office of Weights and Measures	NA
NTEP Administrator	Darrell Flocken	NCWM	NA
Measurement Canada Advisor	Erica Garnier	Measurement Canada	NA

National Type Evaluation Program (NTEP) Committee

Office	Name	Affiliation	Term Ends
Committee Chair	Mahesh Albuquerque	Colorado	2024
NTEP Administrator	Darrell Flocken	NCWM	NA
Members	Marc Paquette	Vermont	2024
	Gene Robertson	Mississippi	2025
	Daniel Walker	Ohio	2025
	Kevin Schnepf	California	2027

Finance Committee

Office	Name	Affiliation	Term Ends
Committee Chair	Gene Robertson	Mississippi	2024
Nominated Chairman-Elect	TBD		2025
Treasurer	Craig VanBuren	Michigan	2026
AMC Representative	Chris Guay	CGGT	2025
Executive Director	Don Onwiler	NCWM	NA

Laws and Regulations Committee (L&R)

Office	Name	Affiliation	Term Ends
Chair	Mike Brooks	Arizona	2024
Vice-Chair	Tory Brewer	West Virginia	2025
Members	Mauricio Mejia	Florida	2026
	Walter Remmert	Pennsylvania	2027
	Mike Harrington	Iowa	2028
AMC Representative	Brent Price	Gilbarco	2028
Canadian Technical Advisor	Rowan Hensing	Measurement Canada	NA
NIST Technical Advisors	John McGuire	NIST, Office of Weights and Measures	NA
	Lisa Warfield	NIST, Office of Weights and Measures	NA
Committee Coordinator	Constantine Cotsoradis	NCWM	NA

Professional Development Committee (PDC)

Office	Name	Affiliation	Term Ends
Chair	Ethan Bogren	Westchester County, New York	2025
Vice-Chair	Valerie Forbes	Delaware	2024
Members	Scott Simmons	Colorado	2026
	Brian Terry	Arkansas	2027
	Sherry Turvey	Kansas	2028
AMC Representative	Perry Lawton	TESCO	2028
Safety Liaison	John Bell	Missouri	NA
NIST Liaison	Tina Butcher	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	Jason Flint	New Jersey	2025
Vice-Chair	David Aguayo	San Luis Obispo, California	2026
Members	Brett Willhite	Minnesota	2024
	Jim Willis	New York	2027
	Mark Lovisa	Louisiana	2028
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	Jeff Gibson	NCWM	NA
	Allen Katalinic	NCWM	NA
Committee Coordinator	Greg Gholston	Mississippi	NA

Nominating Committee

Office	Name	Affiliation	Term Ends
Chair	Mahesh Albuquerque	Colorado	2024
Members	Cheryl Ayer	New Hampshire	2024
	Stephen Benjamin	North Carolina	2024
	Kurt Floren	Los Angeles County, California	2024
	Jason Glass	Kentucky	2024
	Craig VanBuren	Michigan	2024
	Greg Vander Plaats	Minnesota	2024
	Jim Willis	New York	2024

Credentials Committee

Office	Name	Affiliation	Term Ends
Chair	Bryan Snodgrass	West Virginia	2024
Coordinator	Darrell Flocken	NCWM	NA
Members	Aaron Yanker	Colorado	2025
	Lina Ng	Los Angeles County	2027

Appointed Officials

Office	Name	Affiliation	Term Ends
Chaplain	Scott Simmons	Colorado	2024
Parliamentarian	Chuck Corr	Chuck Corr Consulting	2024
Presiding Officers	Tim Chesser	Arkansas	2024
	Konrad Crockford	North Dakota	2024
	Angel Nazario	Boston ISD Weights and Measures	2024
	Brent Ricks	Montana	2024
Sergeants-at-Arms	TBD	Ohio	2024
	TBD	Ohio	2024

Associate Membership Committee (AMC)

Office	Name	Affiliation	Term Ends
Chair	Bill Callaway	Crompco	2024
Vice-Chair	Jim Pettinato	TechnipFMC	2024
Secretary	Kristi Moore	KMoore Consulting, LLC	2027
Treasurer	Brent Price	Gilbarco, Inc.	2024
Members	David Boykin	NCR Corporation	2027
	Christopher Guay	CGGT	2027
	Bob Murnane	Seraphin Test Measure	2024

Fuels and Lubricants Subcommittee (FALS)

Office	Name	Affiliation
Chair	Vanessa Benchea	Florida
Vice-Chairs	Ron Hayes	Retired
	Randy Jennings	R Jennings
Secretaries	Rebecca Richardson	Retired
	Prentis Searles	American Petroleum Institute
NIST Technical Advisors	John McGuire	NIST, Office of Weights and Measures
	Lisa Warfield	NIST, Office of Weights and Measures
Advisory Member	Curtis Williams	Retired
Public Sector Members	Mahesh Albuquerque	Colorado
	David Au	Georgia
	Stephen Benjamin	North Carolina
	David Deroche	Louisiana
	Mike Harrington	Iowa
	Steve Harrington	Oregon
	Allan Morrison	California
	Doug Rathbun	Illinois
	Kevin Schnepf	California
	Bill Striejewski	Nevada
	Kevin Upschulte	Missouri
	Timothy White	Michigan
	Michelle Wilson	Arizona
Private Sector Members	Kevin Adlaf	ADM
	Holly Alfano	Independent Lubricant Manufacturers Association
	Teresa Alleman	Holly Energy
	Scott Boorse	PEI
	Chuck Corr	Chuck Corr Consulting
	Jacki Fee	Cargill
	Scott Fenwick	Clean Fuels Alliance America
	Rick Fragnito	Shell
	Jennifer Green	CITGO Petroleum Corporation
	Marilyn Herman	Herman and Associates
	Joanna Johnson	Preventative Automotive Maintenance Association
	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, LLC
	Kristi Moore	KMoore Consulting, LLC
	Jeanelle Morris	Navistar, Inc.
	Jim Rocco	Energy Marketers of America
	Matthew Sheehan	Chevron USA, Inc.

Packaging and Labeling Subcommittee (PALS)

Office	Name	Affiliation
Chair	Chris Guay	CGGT
NIST Technical Advisor	John McGuire	NIST, Office of Weights and Measures
Public Sector Members	Angela Godwin	California
	Nicholas Owens	Stark County, Ohio
Private Sector Member	Ann Boeckman	Kraft Food Group, Inc.
Advisory Sector Members	Krister Hard af Segerstad	Retired
	Zina Juroch	Retired

Safety Subcommittee

Office	Name	Affiliation
Chair	John Bell	Missouri
Public Sector Members	Jason Flint	New Jersey
	David Fraser	Montana
Private Sector Members	Bill Callaway	Crompco
	Remy Cano	Northwest Tank and Environmental Services
	Robert LaGasse	Mulch and Soil Council

Policy and Bylaw Review Task Group

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

Cannabis Task Group

Office	Name	Affiliation
Co-Chairs	Charles Rutherford	CPR Squared, Inc.
	Vince Wolpert	Arizona
Public Sector Members	Brad Bachelder	Maine
	Kipp Blauer	Nevada
	Ethan Bogren	Westchester County, NY
	James Cassidy	Massachusetts
	Tim Chesser	Arkansas
	Mark Ciociolo	City of Worcester, Massachusetts
	Dr. Matthew Curran	Florida
	David Farmer	Delaware Department of Agriculture
	Jason Flint	New Jersey
	Kurt Floren	Los Angeles County, California
	Elaine Grillo	City of Boston, Massachusetts
	Ivan Hankins	Iowa
	Mike Harrington	Iowa
	Steven Harrington	Oregon
	Kristin Macey	California
	Mauricio Mejia	Florida
	Angel Nazario	City of Boston, Massachusetts
	Josh Nelson	Oregon
	Laurence Nolan	Retired
	William Rigby	Utah
	Louis Sakin	Towns of Holliston, Hopkinton, Northbridge, MA
	Kate Smetana	Colorado
	Dedrick Stephens	City of Cleveland, Ohio
	Ron Valinski	City of Worcester, Massachusetts
	Craig VanBuren	Michigan
	Lisa Warfield	NIST, Office of Weights and Measures
	Jim Willis	New York
	Michelle Wilson	Arizona
	Aaron Yanker	Colorado
Private Sector Members	Michael Bronstein	ATACH
	Brian Duncan	Field Laboratory Seven, LLC
	Evan Foisy	A&D Engineering, Inc.
	Chris Guay	CGGT
	Joanna Johnson	Johnson Policy Associates, Inc.
	Chuck Olivier	DBS
	Ben Raham	WIPOTEC-OCS, Inc.

Promotional Toolkit Task Group

Office	Name	Affiliation
Chair	Stephen Benjamin	North Carolina
Public Sector Members	Jerry Buendel	Retired
	Kurt Floren	Los Angeles County, California
Private Sector Member	Bill Callaway	Crompco

Credit Card Skimmer Education Task Group

Office	Name	Affiliation
Co-Chairs	Alan Walker	Florida
	Owen DeWitt	FlintLoc Technologies
Public Sector Members	Bobby Fletcher	Louisiana
	Paul Floyd	Louisiana
	Mike Harrington	Iowa
	John Larkin	California
	John McGuire	NIST, Office of Weights and Measures
Private Sector Members	Scott Boorse	PEI
	Brent Price	Gilbarco, Inc.
	Mike Roach	PDI
	Scott Schober	Berkley Varitronics Systems

Field Standards Task Group

Office	Name	Affiliation
Chair	Vacant	
NIST Technical Advisor	G. Diane Lee	NIST, Office of Weights and Measures
Public Sector Members	Brad Bachelder	Maine
	Josh Nelson	Oregon
	Greg Vander Plaats	Minnesota
Private Sector Members	Michael Keilty	Endress + Hauser Flowtec AG, USA
	Henry Oppermann	Weights and Measures Consulting, LLC

Verification Scale Division (e) Task Group

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

Milk Meter Tolerance Task Group

Office	Name	Affiliation
Chair	Aaron Yanker	Colorado
NTEP Technical Advisor	Allen Katalinic	NCWM
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
	Jim Willis	New York
Private Sector Member	Carey McMahon	Poul Tarp A/S

NTEP MDMD Work Group

Office	Name	Affiliation
Chair	Chris Senneff	Avery Weigh-Tronix
NTEP Technical Advisor	Darrell Flocken	NCWM
	Jeff Gibson	NCWM
NIST Technical Advisor	Loren Minnich	NIST, Office of Weights and Measures
Canadian Technical Advisor	Joshua Foster	Measurement Canada
	Pascal Turgeon	Measurement Canada
Public Sector Members	Tom Buck	Ohio
Private Sector Members	Sprague Ackley	Digimarc
	Jeff Cooper	National Motor Freight Traffic Association
	Scott Davidson	Mettler-Toledo, LLC
	Brandi Harder	Rice Lake Weighing Systems, Inc.
	Scott Henry	Zebra Technologies
	Robert Kennington	Cubiscan
	Kyle Messerly	Rice Lake Weighing Systems, Inc.
	Don Newell	Newell Enterprises
	Sameer Parmar	SICK, Inc.
	Phil Peterson	SICK, Inc.
	Tony Romeo	Datalogic
	Michael Stutler	UPS
	Richard Suiter	Richard Suiter Consulting
	Matthew Walz	Walz Scale
	Scott Wigginton	United Parcel Service

NTEP EVSE Work Group

Office	Name	Affiliation
Chair	Andrei Moldoveanu	NEMA
NTEP Administrator	Darrell Flocken	NCWM
NTEP Technical Advisor	Jeff Gibson	NCWM
NIST Technical Advisor	Juana Williams	NIST, Office of Weights and Measures
Public Sector Members	Tom Buck	Ohio
	Alison Wilkinson	Maryland Department of Agriculture
Private Sector Members	Keith Bradley	Squire Patton Boggs
	William Hardy	Power Measurements LLC
	Dave Parmelee	Control Module, Inc.
	Ryan Powers	EV Range
	Francesca Wahl	Tesla

NTEP Grain Analyzer Sector

Office	Name	Affiliation
Chair	Karl Cunningham	Illinois
NTEP Administrator	Darrell Flocken	NCWM
NTEP Technical Advisor	Jeff Gibson	NCWM
NIST Technical Advisor	G. Diane Lee	NIST, Office of Weights and Measures
Advisory Member	Cassie Eigenmann	Retired
Public Sector Members	Ivan Hankins	Iowa
	Jason Jordan	USDA, FGIS, Technical Services Division
	Loren Minnich	NIST, Office of Weights and Measures
Private Sector Members	Jeffrey Adkisson	Grain and Feed Association of Illinois
	Rachel Beiswenger	TSI Incorporated
	Martin Clements	The Steinlite Corporation
	Casey Frakes	The Steinlite Corporation
	Andrew Gell	Foss North America
	Charles Hurburgh, Jr.	Iowa State University
	Jess McCluer	National Grain and Feed Association
	Thomas Runyon	Seedburo Equipment Co.

NTEP Measuring Sector

Office	Name	Affiliation
Chair	Michael Keilty	Endress + Hauser Flowtec AG, USA
NTEP Administrator	Darrell Flocken	NCWM
NTEP Technical Advisor	Allen Katalinic	NCWM
	Jeff Gibson	NCWM
NIST Technical Advisor	G. Diane Lee	NIST, Office of Weights and Measures
Public Sector Members	Julie Burbridge	California
	Hunter Hairr	North Carolina
	Pierre LeBlanc	Measurement Canada
	Chad Parker	North Carolina
	Randy Ramsey	North Carolina
	Alison Wilkinson	Maryland Department of Agriculture
Private Sector Members	Steve Bar	Bennett Pump Company
	Marc Buttler	Emerson / Micro Motion
	Craig Cavanaugh	Tuthill Transfer Systems
	Rodney Cooper	Consultant
	Constantine Cotsoradis	Measurement and Metrology Strategies LLC
	Treyton Drake	Advanced Flow Solutions, Inc. dba Corken
	Ronnell Gallon	Zenner Performance Meters, Inc.
	John Hathaway	Murray Equipment
	Dmitri Karimov	Liquid Controls, LLC
	Douglas Long	RDM Industrial Electronics
	Mark McMurtrey	Dover Fueling Solutions
	Richard Miller	FMC Technologies Measurement Solutions, Inc.
	Randy Moses	Wayne Fueling Systems
	Andre Noel	Neptune Technology Group, Inc.
	Robin Parsons	Parafour Innovations, LLC
	Brent Price	Gilbarco, Inc.

NTEP Software Sector

Office	Name	Affiliation
Chair	Jim Pettinato	Technip FMC
NTEP Administrator	Darrell Flocken	NCWM
NTEP Technical Advisor	Jeff Gibson	
NIST Technical Advisor	Jan Konijnenburg	NIST, Office of Weights and Measures
Secretary	Teri Gulke	Liquid Controls, LLC
Public Sector Members	Tom Buck	Ohio
	Julie Burbridge	California
	Katya Delak	NIST, Office of Weights and Measures
	Steve Harrington	Oregon
	Barry Stone	Ohio
Private Sector Members	Mary Abens	Emerson Process Management
	Kevin Detert	Avery Weigh-Tronix
	Andrew Gell	Foss North America
	Dion Harste	AgCode, Inc.
	Dominic Meyer	KSi Conveyors, Inc.
	Richard Miller	FMC Technologies Measurement Solutions, Inc.
	Christopher Odlham	Target
	Ryan Powers	EV Range
	Mike Roach	PDI
	David Vande Berg	Vande Berg Scales
	John Wind	Ossid LLC
	Kraig Wooddell	Hobart

NTEP Weighing / Belt-Conveyor Sector

Office	Name	Affiliation
Co-Chairs	Jessica Ferree	Mettler-Toledo, LLC
NTEP Administrator	Darrell Flocken	NCWM
NTEP Technical Advisor	Jeff Gibson	NCWM
NIST Technical Advisor	Jan Konijnenburg	NIST, Office of Weights and Measures
Advisory Member	Robert Feezor	Retired
Public Sector Members	Tom Buck	Ohio
	Kevin Chesnutwood	NIST, Mass and Force Group
	Nathan Gardner	Oregon
	Steve Harrington	Oregon
	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, Inc.
	Scott Davidson	Mettler-Toledo, LLC
	Tom Dorward	Mettler Toledo North America
	Mitchell Eyles	Flintec, Inc.
	Andrew Goddard	Marel, Ltd.
	Brandi Harder	Rice Lake Weighing Systems, Inc.
	Jon Heinlein	Transcell Technology, Inc.
	Scott Henry	Zebra Technologies
	Sam Jalahej	Totalcomp, Inc.
	Edward Luthy	Retired
	Ben Raham	OCS Checkweighers, Inc.
	Thomas Schuller	Cardinal Scale Mfg. Co.
	Wes Strawn	Red Seal Measurement
	Jerry Wang	A&D Engineering, Inc.
	Eric Wechselberger	Mettler-Toledo, LLC
	John Wind	Ossid LLC

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	James Cassidy Commonwealth of Massachusetts		617-933-1131 james.cassidy.newma@gmail.com	
Annual Meeting	May 6 th - 9 th , 2024		Cape Cod, Massachusetts	
Interim Meeting	TBD		TBD	

Central Weights and Measures Association (CWMA)www.cwma.net

States	Illinois Indiana Iowa	Kansas Michigan Minnesota	Missouri Nebraska North Dakota	Ohio South Dakota Wisconsin
Contact	Sherry Turvey Kansas Department of Agriculture		785-564-6682 sherry.turvey@ks.gov	
Annual Meeting	May 20 th - 23 rd , 2024		Des Moines, Iowa	
Interim Meeting	TBD		TBD	

Western Weights and Measures Association (WWMA)www.westernwma.org

States	Alaska Arizona California	Colorado Hawaii Idaho	Montana Nevada New Mexico	Oregon Utah Washington	Wyoming
Contact	David Aguayo Department of Agriculture/Weights and Measures		805-781-5922 daguayo@co.slo.ca.us		
Annual Meeting	TBD		TBD		

Southern Weights and Measures Association (SWMA)www.swma.org

States	Alabama Arkansas Delaware	District of Columbia Florida Georgia	Kentucky Louisiana Maryland	Mississippi North Carolina Oklahoma	South Carolina Tennessee Texas	US Virgin Islands Virginia West Virginia
Contact	Valerie Forbes Delaware Department of Agriculture		302-698-4602 valerie.forbes@delaware.gov			
Annual Meeting	October 6 th – 11 th , 2024		San Antonio, Texas			

2023-2024 Organization Chart

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

General Information

PURPOSE

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

SUPPORTING DOCUMENTS

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

ITEMS GROUPED INTO BLOCKS

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

FIRST TIME ATTENDEES

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

AGENDA

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

The agendas:

- Shall include items brought to the attention of the Standing Committees prior to the submission deadline of August 15, 2023, and approved for inclusion in their agendas by the Committees; and
- Shall serve as the basis for the Standing Committee Interim Reports; to be printed in the program and Committee reports of *NCWM Publication 16, Committee Reports for the 109th Annual Meeting* to be held

General Information

July 14th-18th, 2024 at the Renaissance Cleveland Hotel in Cleveland, OH. The final reports of the Committees will be published following the 109th NCWM Annual Meeting in the *Annual Report of the 109th National Conference on Weights and Measures*.

WRITTEN COMMENTS OR ORAL STATEMENTS

Any person or organization wanting to provide a formal presentation during a Committee session should make the request in writing to the Executive Director. Reasonable limitations on time allotted for presentations will be imposed.

Note: Only registered attendees may make presentations.

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

JOINT MEETINGS FOR ALL COMMITTEES

A Joint Meeting for all Committees will be held:

- Sunday, January 7, 2024

PARTICIPATION

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

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

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

REPORTS

There will not be a transcript made of the proceedings of NCWM Interim Meetings. Each Committee will prepare its report containing its recommendations based upon the presentations, discussions, and deliberations on all matters on its agenda that were addressed during the Interim Meeting. These reports will be published in *NCWM Publication 16, Committee Reports for the 109th Annual Meeting*, to be posted online at www.ncwm.com in early April. Printed copies of *NCWM Publication 16* will be distributed to meeting attendees at the NCWM Annual Meeting in July.

ANNUAL MEETING

The 109th NCWM Annual Meeting will be held at:

The Renaissance Cleveland Hotel / July 14th-18th, 2024

UNITS OF MEASUREMENT

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

General Information

2024 Final Report of the Board of Directors

Mr. Gene Robertson, NCWM Chairman
Mississippi

INTRODUCTION

This is the report of the Board of Directors (hereinafter referred to as the “Board”) for the 108th Annual Meeting of the National Conference 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.

Note: It is the 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

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

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Table B
Glossary of Acronyms and Terms

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

Details of All Items
(In order by Reference Key)

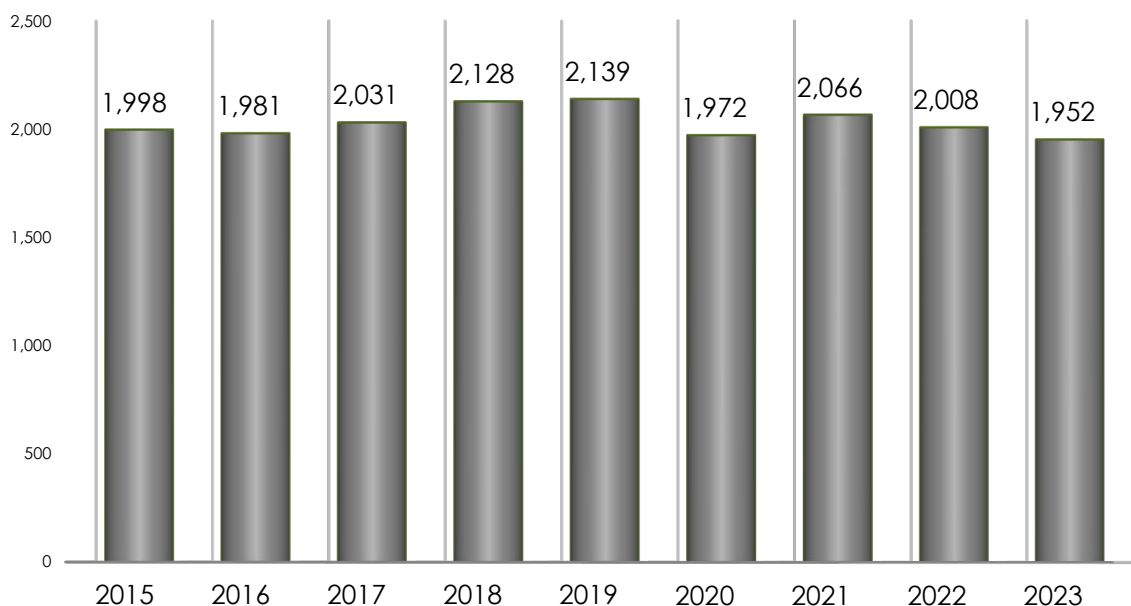
ACT – ACTIVITY REPORTS

ACT-1 I Membership

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

Year Type	Oct. 2015	Oct. 2016	Oct. 2017	Oct. 2018	Oct. 2019	Oct. 2020	Oct. 2021	Oct. 2022	Oct. 2023
Associate	670	668	658	643	636	607	608	609	573
Foreign Associate	58	66	68	70	79	77	91	86	76
Total Associate	728	734	726	713	715	684	699	695	649
State Government	575	552	615	739	744	614	698	644	564
Local Government	444	447	429	412	406	397	389	380	350
Total Active	1019	999	1044	1151	1150	1011	1087	1024	914
NIST	15	13	15	15	17	16	15	19	14
Other Federal Government	10	7	10	10	8	7	7	5	7
Foreign Government	13	12	13	14	14	13	13	14	15
Retired	213	216	223	225	235	241	245	248	353
Total Advisory	251	248	261	264	274	277	280	286	389
	1998	1981	2031	2128	2139	1972	2066	2008	1952

Annual Membership Totals as of October 1, Each Year



ACT-2 I Meetings

Interim Meetings:

- January 7-10, 2024 Royal Sonesta Hotel, New Orleans, Louisiana
- January 12-15, 2025 Francis Marion Hotel, Charleston, South Carolina
- January 11-14, 2026 Renaissance Mobile Riverview Plaza Hotel, Mobile, Alabama

Annual Meetings:

- July 14-18, 2024 109th Annual Meeting: Renaissance Cleveland Hotel, Cleveland, Ohio
- July 13-17, 2025 110th Annual Meeting: Silver Legacy Resort Hotel, Reno Nevada
- July 26-30, 2026 111th Annual Meeting: Marriott Old City, Philadelphia, Pennsylvania

NCWM strives to plan meetings in locations that have reasonably priced airline service and are within government per diem rates. The Board also evaluates locations and bids from hotels based on their ability to offer comfortable rooms, quality meeting space, and a variety of nearby entertainment and dining options. For more information about this meeting, contact Ms. Elisa Stritt, NCWM Meeting Planner, 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 during Open Hearings of the 2024 NCWM Interim Meeting. See Appendix A for a copy of the full report. The Board of Directors expresses appreciation to NIST staff for the report and the important efforts of the NIST, Office of Weights and Measures around the world.

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

ACT-4 I Associate Membership Committee Activity

Approximately 35% of NCWM memberships is 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 \$90 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 to receive 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.

ACT-5 I Task Groups, Subcommittees, Steering Committees

Focus Groups, Task Groups, Subcommittees, Steering Committees:

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

NCWM offers resources to these task groups and subcommittees including meeting space at Interim and Annual Meetings, conference calling and web meeting services, group email services, a dedicated web page for posting and archiving documents related to their work, and broadcast e-mail services to reach targeted audiences. Additionally,

2024 NCWM Interim Meeting Agenda
Board of Directors

NIST OWM has provided technical advisors and web meeting forums. These tools enable year-round progress of task group and subcommittee work.

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

The Promotional Toolkit Task Group reports to the Board of Directors. Among the activities of this group, it has developed multiple videos, each showcasing inspection activities in the supermarket, scale inspections, retail motor fuel dispenser inspections, motor fuel quality, and checking the net contents of packaged goods and LP Gas Meter inspections. Mr. Stephen Benjamin (NC) reported that the next video will be about grain analyzer inspections. Mr. Benjamin expects the next video to highlight laboratory metrology. Video productions will resume in spring 2022.

The Cannabis Task Group also reports to the Board of Directors. This group is addressing Scale Suitability, Method of Sale, Packaging, and Labeling, Water Activity in Packaged Products, and Inspector Safety. Mr. James Cassidy (MA) reported that the Task Group is developing Form 15 proposals to amend NCWM standards in the NIST Handbooks. This is based on assurance from Dr. Olson (NIST OWM) that NIST will be able to publish the standards.

Chairman Mr. Hal Prince (FL) appointed a new Bylaws Review Task Group in August 2020 to also report to the Board of Directors. Mr. Craig VanBuren (MI) is Chair of this group. The group made recommendations to amend NCWM Bylaws allow NCWM to conduct virtual voting in the future under certain emergency circumstances. See Board of Directors Item SPB-21.4 for details.

Immediate Past Chairman, Mr. Craig VanBuren (MI) requested anyone with interest in being the Safety Subcommittee Chair to reach out to him or PDC Chair Mr. Marc Paquette (VT).

Reporting to the Board of Directors:

Promotional Tool Kit Task Group

Chair

Mr. Stephen Benjamin
North Carolina Department of Agriculture
919-707-3225, steve.benjamin@ncagr.gov

Cannabis Task Group:

Co-Chair

Mr. Charles Rutherford
CPR Squared, Inc.
612-655-5494, charlie@cprsquaredinc.com

Co-Chair

Mr. Vince Wolpert
Arizona Department of Agriculture
602-920-4236, vwolpert@azda.gov

Policy and Bylaw Review Task Group

Chair

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

Reporting to the Laws and Regulations Committee:

Fuels and Lubricants Subcommittee

Chair

Vanessa Benchea
Florida Department of Agriculture and Consumer Services
813-868-8263, Vanessa.Benchea@fdacs.gov

Packaging and Labeling Subcommittee

Chair

Mr. Chris Guay

CGGT

513-652-6597, guay.cb@gmail.com

Reporting to the Specifications and Tolerances Committee:

Field Reference Standards Task Group

Chair

Vacant

Milk Meter Tolerance Task Group

Chair

Mr. Aaron Yanker

Colorado Department of Agriculture

719-250-1851, aaron.yanker@state.co.us

Verification Scale Division (e) Task Group

Chair

Evan Foisy

A&D Engineering

631-560-3497, EFoisy@andonline.com

Reporting to the Professional Development Committee:

Safety Subcommittee

Chair

Mr. John Bell

Missouri Department of Agriculture

573-751-8599, johnny.bell@mda.mo.gov

Skimmer Education Task Group

Chair

Alan Walker

Florida Department of Agriculture and Consumer Services

805-274-9044, alan.walker@FDACS.gov

ACT-6 I Regional Association Activities

2024 Meetings

NEWMA Annual Meeting

May 8-11, 2023

Saratoga Springs, NY

Contact: Mr. James Cassidy, james.cassidy@mass.gov

CWMA Annual Meeting

May 15-18, 2023

Grand Rapids, MI

Contact: Ms. Elizabeth Lambert, elizabeth.lambert@mda.mo.gov

WWMA Annual Meeting

September 17-20, 2023

Sparks, NV

Contact: Mr. Mahesh Albuquerque, mahesh.albuquerque@state.co.us

SWMA Annual Meeting

October 8-11, 2023

Annapolis, MD

Contact: Stephen Benjamin, steve.benjamin@ncagr.gov

SPB – STRATEGIC PLANNING, POLICIES, AND BYLAWS

SPB-1 I Strategic Planning

The Board of Directors presented the draft strategic plan to membership for comments in 2023. Based on comments received, the board adopted the new strategic plan at its fall 2023 quarterly meeting. The plan is considered a living document subject to ongoing review and updates as strategies are completed and new strategies are added.

SPB-23.1 I Various Bylaw Sections: Voting Twice Each Year

Source:

Board of Directors, Voting Focus Group

Purpose:

The purpose of this item is to expand the NCWM voting process from once per year to twice per year, improving and enhancing the function of NCWM.

Item under Consideration:

Amend NCWM Bylaws as follows:

Articles I-III – No Change

Article IV - Membership Fees and Records

Section 3 – Waiver of Registration and Membership Fees

Individuals who have retired after 10 or more years of weights and measures employment in either the public or private sectors, and who have attended at least one Winter or Summer Annual Meeting (or Annual Meeting if before 2024), shall not be subject to the payment of the registration and membership fees. The spouses of retired members shall enjoy the same privileges as spouses of active members.

Article V – No Change

Article VI – Directors and Appointive Officials

Section 1 – No Change.

Section 2 – No Change.

Section 3 – Nominations and Elections, Parts A, B, C, D

A. Nominating Committee

Each year prior to the Corporation's ~~Winter Interim~~ Meeting, the Chairman shall appoint a Nominating Committee. The Past Chairman will serve as Chairman of the Nominating Committee.

B. Nominations

1. The Nominating Committee shall submit one name for each elective office and present its recommendation as a slate in its report to the Corporation.

2. Additional nominations for officers may be made from the floor at the ~~Summer Annual~~ Meeting provided that prior consent of the nominee has been obtained in writing and presented to the presiding officer at the time of the nomination.

C. Elections

Directors shall be elected during a designated session of the ~~Summer Annual~~ Meeting by a formal recorded vote of the members in attendance and eligible to vote on Corporation motions. See Bylaws, Article X - Voting System

D. Terms of Office

1. The Chairman, Chairman-Elect and Past Chairman shall serve for a term of 1 year. The Chairman-Elect will be elected at the ~~Summer Annual~~ Meeting one year prior to the term of service as Corporation Chairman. After serving one year as Chairman-Elect, the incumbent will succeed to the office of Corporation Chairman. The consecutive reelection of a Chairman and Chairman-Elect is prohibited; however, the eight other directors may be re-elected. The eight other directors shall serve for 5-year terms; except for the Associate Director and Treasurer who shall serve a 3-year term. Elections shall take place at such intervals as are necessary to retain an 11-member Board at all times, except that vacancies shall be filled under Section 3, paragraph E, below.

2. All Directors shall take office immediately following the close of the ~~Summer Annual~~ Meeting at which they were elected.

3. No Change.

E. No Change.

Section 4 – No Change.

Section 5 – Removal of Directors

A director may be removed for cause upon a vote for his or her removal by a majority of the Board at a properly called meeting of the Board. Removal for cause shall include, but not be limited to, failure by the Director to attend two consecutive meetings of the Corporation. For purposes of this section, two consecutive meetings shall mean ~~Winter or Summer annual or interim~~ Winter meetings of the Corporation.

Section 6 – Appointive Officials

A. No Change.

B. Assumption of Office

All appointive officials shall take office immediately following appointment and will serve through the subsequent ~~Summer Annual~~ Meeting of the Corporation unless otherwise specified by the Corporation Chairman.

Article VII – Duties of the Directors and Appointive Officials

Section 10 – Sergeants-at-Arms

The Sergeants-At-Arms help preserve order during the public sessions of the ~~Corporation's Corporation~~ Winter and Summer Meetings Annual Meeting. Their responsibilities include ensuring that only registered delegates are present and that individuals or groups appearing before the Corporation are properly identified.

Article VIII – Meetings of the Corporation

Section 1 – Business Meetings ~~Annual Meeting~~

The Annual Business Meeting of members shall be held at the ~~Summer Annual~~ meeting of the Corporation. However, the Board of Directors may call for a Business Meeting at the Winter Meeting, should it be deemed necessary. Notice of ~~all the Business Meetings annual-meeting~~ shall be given. Notice shall be no less than 10 days before the date of the meeting, except that notice to act on an amendment to the Articles of Incorporation, a plan of merger, a proposed sale of assets or the dissolution of the Corporation shall be given not less than 25 days before the date of the meeting.

The agenda for this meeting shall include the election of the Board of Directors and reports from the Chairman and the Treasurer.

Section 2 – Technical Meetings

~~A The Annual~~ Technical Meeting shall ~~also~~ be held at the Winter and Summer Meetings Annual-meeting of the Corporation and may include reports from various committees, task forces, study groups, and other items pertinent to the Corporation, as well as the presentation of technical papers, discussions, displays, education ~~entertainment~~, or other events at the discretion of the Board of Directors.

Section 3 ~~Section 2~~ – Board of Directors and Standing Committee ~~Interim~~ Meetings

~~The Interim~~ Meetings of the Board of Directors and those Standing Committees designated by the Chairman shall be held ~~annually~~, approximately 6 months prior to the next meeting Annual Meeting in order to develop the agenda and committee recommendations to be presented to and acted on by the membership at the next meeting Annual Meeting.

Section 4 ~~Section 3~~ – Conduct of Summer Annual and Winter ~~Interim~~ Meetings

~~The Summer Annual~~ and Winter Interim meetings shall be in-person meetings, excepted only in the event that an emergency is declared by the Board of Directors to allow either meeting to be held entirely or in-part by internet meeting services. Justification and classification of the emergency declaration are at the discretion of the Board and may include, but are not limited to, a pandemic that prevents a significant number of members from participating in an in-person meeting. Such emergency declarations and related determinations to allow internet meetings shall not, however, be uniquely applied to, or employed regarding, any individual agenda item or any subset of items within a complete meeting agenda. The Board of Directors shall maintain policies for conducting these meetings following the principles of the in-person meetings as closely as possible.

Section 5 ~~Section 4~~ – Other Meetings of the Board of Directors, Committees and Subgroups within the Corporation.

A. No Change.

B. Other Committees and subgroups of the Corporation are authorized to hold meetings at times other than the Summer or Winter Annual Meeting or Interim. Meeting by any manner technologically possible, including, but not limited to telephone conference call, web meeting and email. If a committee or subgroup desires to conduct a meeting requiring travel and facilities at the expense of the corporation, such meeting will be subject to approval in advance by the Board of Directors.

Section 6 ~~Section 5~~ – No Change otherwise.

Article IX - Committees

Sections 1-4 – No Change.

Section 5 – Duties and Fields of Operation of Board of Directors and Committees

A. Laws and Regulations Committee

The Laws and Regulations Committee **biannually ~~annually~~** presents a report for Corporation action. Its scope embraces all matters within the area of weights and measures supervision including:

the development and interpretation of uniform laws and regulations;

1. the study and analysis of bills for legislative enactment;
2. the establishment and maintenance of published guidelines and other effective means of encouraging uniformity of interpretation and application of weights and measures laws and regulations; and
3. liaison with Federal agencies, State agencies, and other groups or organizations on issues within the purview of the Committee. This role entails explaining, advocating, and coordinating Corporation positions, recommendations, and needs before Federal Government agencies, consumer groups, the associate NCWM membership, domestic and international standards organizations, industry, trade associations, and others. The goals are to provide and solicit information, develop a spirit of cooperation, and promote uniformity with the activities and standards of the NCWM.

B. Specifications and Tolerances Committee

The Specifications and Tolerances Committee **biannually ~~annually~~** presents a report for Corporation action.

Its scope embraces all matters dealing with:

1. specifications, tolerances, and technical requirements of any kind relating to scales, weights, measures, and weighing and measuring devices and accessories, including interpretation of such material whenever necessary,
2. standards and testing equipment for weights and measures officials,
3. procedures for testing commercial equipment, and
4. liaison with Federal agencies, State agencies, and other groups or organizations on issues within the purview of the Committee. This role entails explaining, advocating, and coordinating Corporation positions, recommendations, and needs before Federal Government agencies, consumer groups, the associate NCWM membership, domestic and international standards organizations, industry, trade associations, and others. The goals are to provide and solicit information, develop a spirit of cooperation, and promote uniformity with the activities and standards of the NCWM.

C. Professional Development Committee

The Professional Development Committee **biannually ~~annually~~** presents a report for Corporation action.

The mission of the Committee is:

To provide leadership to develop and implement uniform, quality weights and measures services in the areas of:

1. effective program management,
2. education, and
3. public relations.

C.1-C.2. No Change

3. Conference Training Topics

The Committee would be the focal point for gathering and recommending workshops or symposia on leadership, management, and emerging issues to be presented during the **Summer and Winter Meetings Annual Meeting**. These topics would provide a forum for the exchange of ideas and discussion of changes in the marketplace.

3. Uniformity of Data - No Change

Part D. Nominating Committee

The Nominating Committee annually presents a slate of nominees for all elective offices. The names of these nominees shall appear in the report of the Nominating Committee and shall be published in the Program and Committee Reports for the **Summer annual** meeting of the Corporation.

Parts E-G – No Change.

Article X - Voting System

In the case of business issues relating to NCWM, Inc., as a Corporation, all questions before a meeting of the Corporation are to be decided by voice vote of members of all three houses.

Members of all three houses may speak to all issues on the floor, both business and technical issues. However, the adoption of final reports of committees on technical issues, as well as other technical issues, is to be decided by a formal recorded vote of the active members in accordance with the following voting structures and procedures. The determination as to whether an issue is technical or business shall be made by the Board in accordance with the policies and procedures of the Corporation.

Section 1 - House of State Representatives

A. Official Designation

This body of Active members who are officially designated by their States and are present and registered at the **Winter and Summer Meetings Annual Meeting** shall be known as the "House of State Representatives."

B. Composition

Each State is authorized one official to serve as its representative at the **Winter and Summer Meetings Annual Meeting** of the NCWM. The State weights and measures director, or his or her designee (State or local government official), is the State representative.

The District of Columbia, the Navajo Nation, and the U.S. Commonwealths and Territories that have weights and measures programs similar to those of the States (for example, have followed the uniform laws and regulations and have adopted Handbook 44) are also allowed representatives.

C. Method of Designation

Each representative is specified annually to the Credentials Committee 30 days before the NCWM **Winter and Summer Meetings Annual Meeting**. Accommodation may be made for exceptions to this deadline. An alternate should be named prior to the NCWM **Winter and Summer Meetings Annual Meeting** in case the designated representative cannot attend.

Section 2 - House of Delegates

Official Designation

All other Active members present and registered at the Winter and Summer Meetings ~~Annual Meeting~~ (those not sitting in the House of State Representatives) are grouped as a body known as the "House of Delegates."

Section 3 - House of General Membership

Official Designation

This body shall comprise Associate and Advisory members of NCWM, Inc., who are present and registered at the Winter and Summer Meetings ~~Annual Meeting~~. The House of General Membership shall vote, as well as the House of Representatives and the House of Delegates, on all business issues relating to NCWM, Inc., as a Corporation.

Section 4 Minimum Votes Needed for an Official Vote of a House on Technical Items – No Change

Section 5 - Voting Rules

A. Quorum - No Change

B. Proxy Votes

Proxy votes are not permitted. Since issues and recommendations in the committees' ~~interim~~ reports are often modified and amended at the NCWM Winter and Summer Meetings ~~Annual Meeting~~, the attendance of officials at the Winter and Summer Meetings ~~Annual Meeting~~ and voting sessions is vital.

C.-F. No Change

Section 6 - Committee Reports – No Change

Section 7 - Amendments and Changes – No Change

Section 8 – Seating - No Change

Section 9A - Voting- Technical Issues

A.-B. No Change

C. Issue Returned to Committee for Future Consideration If:

1. The House of Representatives fails to cast the minimum number of required votes for an item to pass or fail.
2. The minimum number of required votes is received from ~~east in~~ each house but one house votes "yea" ~~yea~~ and the other house votes "nay" ~~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 Winter or Summer ~~Annual~~ Meeting.

Voting on Technical Issues: The 2-House System								
			House of Delegates					
			Majority Vote Yea		Majority Vote Nay		Tie Vote	
			≥ 27 Votes	< 27 Votes	≥ 27 Votes	< 27 Votes	< 54 total votes	≥ 54 total votes
House of State Representatives	Majority Vote Yea	≥ 27 Votes	Motion Accepted	Motion Accepted	Returned to Committee	Motion Accepted	Motion Accepted	Returned to Committee
		< 27 Votes	Returned to Committee	Returned to Committee	Returned to Committee	Returned to Committee	Returned to Committee	Returned to Committee
	Majority Vote Nay	≥ 27 Votes	Returned to Committee	Motion Rejected	Motion Rejected	Motion Rejected	Motion Rejected	Returned to Committee
		< 27 Votes	Returned to Committee	Returned to Committee	Returned to Committee	Returned to Committee	Returned to Committee	Returned to Committee
	Tie Vote		Returned to Committee	Returned to Committee	Returned to Committee	Returned to Committee	Returned to Committee	Returned to Committee

Section 9B – Voting – Business Issues – No Change

Section 10 - Procedures – No Change

Article XI - Amendments

These Bylaws may be amended, added to, or repealed at any ~~Winter or Summer Annual~~ Meeting of the membership under normal Corporation procedures. Proposed changes must be published in the recommendations of the Board of Directors in its ~~Interim~~ Report (contained in the Program for the ~~Winter and Summer Meetings Annual Meeting~~, NCWM ~~Publications 16W or 16S Publication 16~~) and discussed at the open hearing of the Board of Directors at the ~~Winter or Summer Annual~~ Meeting at which said changes will be voted on. Amendments to the Bylaws must be approved by a minimum of a simple majority vote of the general membership in attendance.

Previous Action:
New in 2023

Original Justification:

There is a necessity for the NCWM to be able to respond in a sufficient and timely manner to changes and new technology emerging in the nation's marketplace. Currently, many states adopt the Handbooks crafted by the NCWM, but are unable to enforce without proper codes. Likewise, the industry often cannot use new technology or advance without updates to existing jurisdictional codes. This change would enhance the function and efficiency of the NCWM and provide regulators and the regulated community with improved response to marketplace changes.

The Focus Group acknowledges that some jurisdictions may be impacted due to the likelihood of slight increase in costs to have two voting sessions per year.

While the NCWM does not have oversight over the four regional associations; however, there are currently two regional associations (the Southern (SWMA) and the Western (WWMA)) that meet once per year whereas the other two regional associations (the Central (CWMA) and the Northeastern (NEWMA)) currently meet twice per year. The two regional associations that currently meet only once per year would have to determine the impact and consider adjustments, if any, they felt necessary to in order to preview items that were introduced in the Spring cycle.

Comments in Favor:

Regulatory:

- Mr. Vince Wolpert (AZ) spoke in support of voting twice a year and would also like to see more details regarding how the supporting events would look. He also encouraged the BOD to look at an electronic mechanism for the development of agenda items.
- Mr. Joe Smith (WI) supported the proposed language regarding items that do not pass but do not fail. He also noted that members have responsibility in this and should be held accountable. He questioned if we needed to look at what constitutes an item passing or failing as well.
- Mr. Ed Williams (Ventura County, CA) was pretty much in favor of voting twice a year. He liked splitting up the Open Hearings (into two) and also supported Mr. Brewer's suggestion (see Neutral Comments) to revisit such items again in the second Open Hearing session. He noted that such changes may require an additional meeting for some regions.
- Mr. Joe Smith (WI) spoke in support of the proposed language regarding items that do not pass but do not fail. He also noted that members have responsibility in this and should be held accountable. Mr. Smith also questioned if we needed to look at what constitutes an item passing or failing as well.
- Mr. Ed Williams (Ventura County, CA) stated he was pretty much in favor of voting twice a year. He also stated he likes splitting up the Open Hearings (into two) and also supports Mr. Brewer's suggestion to revisit such items again in the second Open Hearing session. Mr. Williams also noted that such changes may require an additional meeting for some regions.

Industry:

- Mr. Randy Jennings (Representing Himself) noted that he was in favor of voting twice per year but not in favor of the proposal in Section 9A pertaining to items that do not pass, but do not fail. Mr. Jennings also stated that he felt this (Section 9A proposal) would put added pressure on Committee Chairs.
- Mr. Dmitri Karimov (Liquid Controls) spoke in support of voting twice a year but expressed concern regarding having enough members to be able to vote at the (new) Winter Meeting. He also noted that he too was concerned over the process in general as was mentioned by Mr. Murnane. He felt that many items submitted are poorly drafted and in need of improvement. Lastly, he suggested that Form 15 needed to be reviewed for improvement.
- Mr. Michael Keilty (Endress + Hauser Flow) echoed comments from Mr. Jennings in that he doesn't support the language proposed regarding items that don't pass but don't fail. He also stated that he does not agree with Mr. Murnane regarding fixing the process before moving to voting twice a year. Lastly, Mr. Keilty suggested we look at something in the context of assigning a mentor to help develop successful members.

- Mr. John Hathaway (Murray Equipment) spoke in support of voting twice per year but didn't support the proposed language regarding items that don't pass but don't fail.

Advisory:

- None

Comments Against:

Regulatory:

- Mr. Jim Willis (NY) expressed some hesitation and wanted to see more details regarding how other aspects would be affected. Mr. Willis also noted that changes to the Handbooks require legislative ratification in his state so voting twice a year may not provide much benefit for him.

Industry:

- Mr. Bob Murnane (Seraphin) said he was not opposed to voting twice a year but thought the development process needed to be fixed first. He noted that he was encouraged by the committee training discussions that have taken place though. He suggested the formation of a group to evaluate recommended changes starting from scratch (not repairing the current process). He concluded by stating that he would not support this item until the process was fixed.

Advisory:

- None

Neutral Comments:

Regulatory:

- Mr. Kurt Floren (Los Angeles County, CA) stated he was still concerned about having two open hearing sessions. He stated he was not against voting twice per year as a matter of efficiency. However, Mr. Floren stated nothing in this item addresses how quickly a committees handle agenda items, specifically priority items. He stated he felt the April and November cut-off dates are insufficient for members to thoroughly review such items.
- Mr. Tory Brewer (WV) stated he is not against the idea of voting twice per year but was initially concerned how it might look. He thanked the BOD for providing details regarding how several aspects might look and noted he now has a clearer picture of how things could work.
- Stephen Benjamin (NC) noted that he was unable to participate in the last discussion but asked about items that didn't pass but didn't fail. Specifically, if they would retain their Voting status when returned to Committee. The BOD clarified the items that don't pass, but don't fail were no longer being considered with a time restriction and would be handled as they always have, rather based on membership feedback at the 2023 NCWM Interim Meeting Developing Items were now being considered for a time restriction. It was also noted by the BOD that this would be an NCWM Policy change as opposed to an NCWM Bylaw change.
- Mr. James Cassidy (MA) concurred with Mr. Brewer's comments. He also stated that he would like to see drafts of the policy changes as well and in addition projected attendance increases to ensure that a quorum would be present at the Winter Meeting (for voting) and post the previous attendance numbers.
- Mr. Walt Remmert (PA) agreed with Mr. Brewer and would like to see specific details regarding how this change would affect all peripheral aspects.
- Mr. Jason Flint (NJ) stated that he doesn't believe the items that don't pass but don't fail are the problem. He stated that the Developing Items are causing the large agenda sizes.
- Mr. Jose Arriaga (Orange County, CA) echoed Mr. Floren's comments. He also asked how splitting the Publications (15 and 16) would work regarding Committee reports.

- Mr. Jason Glass (KY) said he was not against voting twice a year but thought the policies that were discussed needed further vetting. Mr. Glass suggested that instead of moving directly to voting twice a year, the BOD should consider testing the process by only voting (twice a year) on items that did not pass but did not fail (i.e., vote on them at the next meeting) and see how that worked before moving fully into the process of voting twice a year on everything.

Industry:

- Mr. Mike Roach (PDI) stated that he agreed with Mr. Floren's statement regarding the proposal for items that do not pass but do not fail.

Advisory:

- Ms. Tina Butcher (NIST OWM) stated she felt more details regarding how this proposal would affect other functions was needed. She also stated that the Committees needed to be given the items after they're developed, not have the Committees do the developing. She also concurred that the agendas are too large.

Item Development:

2023 NCWM Interim Meeting: A presentation by the NCWM Board of Directors Focus Group Chair, Dr. Matthew Curran, was given to the NCWM membership on Sunday, January 8, 2023. The presentation contained updates and modifications based on feedback following similar presentations given at the 2022 NCWM Annual Meeting in Tacoma, WA and at each of the four regional association meetings in the fall of 2022. The session was well attended and generated a lot of good discussion and interest. The comments were formally heard on Tuesday, January 10, 2023, during the Open Hearings for the Board of Directors agenda.

Based on feedback received from the NCWM Membership during the Open Hearings at the 2023 NCWM Interim Meeting the Focus Group provided supplemental information below, for clarity.

2024 NCWM Open Hearings: Based on some remaining concerns voiced at the Annual Meeting, the Board will continue to vet and develop this proposal.

Please note that the following content is NOT being voted upon in this agenda item rather it is being provided for additional clarity, to answer questions received by the Focus Group, and can be changed outside of the NCWM Voting process (but pursuant to NCWM Bylaws). The policy amendment drafts below were approved by the Focus Group but will require final approval by a majority vote of the Board of Directors before they can be implemented.

- Section 1: Proposed Policy Modifications
- Section 2: Mock Agenda
- Section 3: Committee Member Rotations
- Section 4: Committee Reports
- Section 5: Open Hearings
- Section 6: Duration for Developing Items
- Section 7: Interim Meeting Attendance Statistics

Section 1: Proposed Policy Modifications

Policy 1.1.2. Development and Review of NCWM Policy

Purpose: Establish a policy for setting and reviewing NCWM bylaws and policies.

Background: The NCWM Bylaws give the Board of Directors sole responsibility to set the policies for the corporation. This policy establishes the process the Board of Directors is to follow in establishing, amending or repealing bylaws and policies and creates a systematic review process of existing bylaws and policies.

Policy:

1. The Board of Directors shall propose bylaws and set policies which ensure the proper operation of the corporation.
2. The Board of Directors shall operate similar to a standing committee to gather input from the membership on proposed modifications to the bylaws.
 - a. The Board will comply with NCWM Bylaws, Article XI-Amendments when adding, amending or repealing any bylaws.
 - b. Adding, amending and repealing policies require a simple majority vote of the Board of Directors.
3. Members may propose a modification to the published bylaws or policies.
 - a. Changes to bylaws are initiated by submitting a Form 15
 - b. Changes to NTEP administrative policies are initiated by submitting a **Form form** 15
 - c. Changes to NCWM policies are initiated through a regional board representative.
4. The Board may establish or modify existing policies without review by the membership.
5. The Board of Directors shall use the following five-year cycle for reviewing the bylaws and policies beginning on January 2015.
 - a. Year 1 - Bylaws
 - b. Year 2 - Administrative and Travel policies
 - c. Year 3 - Meeting policies
 - d. Year 4 - Publication policies
 - e. Year 5 - NTEP administrative policies

Policy 1.1.3. Performance Evaluation of the NCWM Executive Director

Purpose: Establish a policy for evaluating the NCWM Executive Director.

Background: The Board of Directors of NCWM believes the Executive Director should be periodically evaluated to ensure he/she is improving and continuing to meet the needs of the corporation and its members. This policy establishes the process for evaluating the Executive director.

Policy:

6. Performance Evaluations of the Executive Director
 - a. The Chair of the Board of Directors shall work with the Board to identify an evaluation instrument to be used in evaluating the Executive Director. The instrument in Attachment 1 shall be used for the evaluations until the board approves a new instrument. The new instrument would be used in the next evaluation cycle.
 - b. The Evaluation Committee shall conduct an annual evaluation using the timeframe in 1c below. The Evaluation Committee are the current Chair of the Board of Directors, Past Chair, Treasurer and Chair-Elect.
 - c. The annual evaluation cycle, beginning in May, for the Executive Director shall consist of several steps:
 - i. Prior to the spring Board meeting the Evaluation Committee shall conduct a formal evaluation of the Executive Director. During executive session of the spring Board meeting, the Chair will present a brief summary of the evaluation to the Board.

- ii. At the spring Board meeting the Evaluation Committee shall present the proposed objectives for the Executive Director for the upcoming year to the Board for consideration and approval. The Chair shall discuss the objectives with the Executive Director after the meeting.
- iii. The Evaluation Committee shall conduct an informal mid-year evaluation at the NCWM **Winter Interim** Meeting.
- iv. The Chair shall discuss the status and progress toward the objectives with the Executive Director at the fall Board meeting.
- v. The evaluations of the Executive Director are confidential documents and the completed evaluations will be held by the NCWM attorney. Only the Executive Director Board Chair, Chair-Elect and Treasurer shall have access to the past evaluations.

Attachment 1 – Performance Evaluation Instrument

Attachment 2 – General Responsibilities of the Executive Director

Policy 1.4.1. Records Retention

Purpose: This policy establishes a schedule for reducing the storage of company records while maintaining good business practices.

Background: NCWM management transferred from NIST to contracted association management in 1998 and then from contracted services to full time employees in 2008. Through those transitions, some records were transferred, and others were not. This policy largely reflects the new management's practices for records retention since 2008. For those records that are designated to be retained on a permanent basis, there are limitations due to transitions mentioned here.

Policy:

1. The following Electronic Records shall be permanently maintained in a media that is compatible with current technology.

Annual Budgets

Accounting Records

NCWM Annual Reports since 1905

NTEP Applications since 10-01-2000

NTEP Certificates since 10-01-2000

NTEP Sector Meeting Documents since 10-01-2008

NCWM Publications 14, 15 and 16 since 10-01-2008

Board of Directors Minutes since 1999

Board Meeting materials since 10-01-2008

Membership Records since 10-01-2008

Annual Meeting Attendance since 1970

Summer Meeting Attendance since 202X

State representation at all Annual Meetings **up to 202X**

State representation at all Winter and Summer Meetings since 202X

2. The following other records will be retained for the designated terms.

Annual Audits since 2001(paper)	Permanently
Check Stubs (paper)	5 years
Bank account reconciliations (paper)	5 years
Payroll Records (electronic)	5 years
Membership Renewals (paper)	5 years
Personnel Records (electronic and paper)	5 years following departure
NIST Grant Documents (electronic)	3 years following close date
NTEP Maintenance Fee Payments (paper)	1 year
Membership Renewal payments (paper)	1 year
Winter and Summer Annual Meeting Voting Records	1 year
NTEP Applications 10-2000 to 10-2008 (paper)	until they are converted to electronic

Policy 1.5.1. Subgroups Supporting the Work of the Organization

Purpose: Define the formation, charge, operation and reporting for each type of group covered in this policy.

Background: Corporate bylaws give the NCWM Chairman the authority to create and appoint members to subcommittees and task groups, but the bylaws do not clearly differentiate between the types of groups in how they operate. On a less formal level, the Board of Directors, standing committees and subcommittees commonly designate small groups within their membership to focus on specific issues as a means of expediting their work. This policy defines types of groups and how they carry out their respective charges.

Policy:

1. Focus Group:

- a) **Purpose:** Focus on one particular element of the larger group's charge in an effort to expedite development.
- b) **Formation:** A Focus Group is formed within and by a committee, subcommittee, task group, or Board of Directors who volunteer to assist in the effort of the Focus Group.
- c) **Charge:** The charge of a Focus Group is very limited to a specific element of the larger group's charge and may be defined by the chair of that larger group.
- d) **Operation:** A Focus Group has available to them all opportunities to meet electronically between regularly scheduled meetings of the larger group. NCWM provides conference call and web meeting services.
- e) **Decision Process:** Informal development of recommendations by the volunteer participants for the larger group.
- f) **Reporting:** A Focus Group reports and provides recommendations to the committee, subcommittee, task group or board within which it was formed. From that point the recommendations will be handled within the standard processes of NCWM.
- g) **Recognition:** Focus Groups are informal and composed of volunteers. They do not appear on the NCWM Organization Chart. It is not mandatory for the board, committee, or subgroup to notify those outside its membership when it creates focus groups.
- h) **Dissolution:** Upon completion of the initial charge or when the focus is no longer needed.

2. Task Group:

- a) **Purpose:** Develop a particular item or issue on the agenda of a committee, subcommittee, or the Board of Directors agendas.
- b) **Formation:** A Task Group may only be established by the NCWM Chairman who will also make all appointments, including the designation of a Task Group chairman. The size and representation by various interests will be defined by the NCWM Chair on a case-by-case basis.
- c) **Charge:** The NCWM Chair will approve the charge of a Task Group at the time of formation and may establish a deadline. The NCWM Chairman must also approve all amendments to the original charge.
- d) **Operation:** A Task Group has available to it all opportunities to meet electronically between regularly scheduled meetings of the larger group and may also request meeting space in conjunction with NCWM **Winter and Summer Interim and Annual** Meetings. NCWM provides conference call, web meeting and group email services.
- e) **Decision Process:** All appointed participants of the Task Group are encouraged to participate fully in the development of and the vote on final recommendations. If a consensus cannot be reached, the vote shall be reported in a manner that shows the count according to participant interest.
- f) **Reporting:** A Task Group reports and provides recommendations to the committee, subcommittee, or the Board of Directors for which it was created.
- g) **Recognition:** Task Groups are formal components of the NCWM structure and are recognized on the NCWM Organization Chart during the term of their operation.
- h) **Dissolution:** The NCWM Chair may dissolve the task group upon completion of the initial charge or at the request of the Standing Committee.

3. Steering Committee:

- a) **Purpose:** Develop a comprehensive and balanced report that will assist NCWM membership in deciding upon a particularly difficult and divisive issue on the agenda of a standing committee through stakeholder input, development, and study of data, and understanding all concerns surrounding the issue. A steering committee should not make recommendations on the outcome of an item or issue.
- b) **Formation:** A Steering Committee may only be formed by the NCWM Chairman who will also make all appointments, including the designation of a steering committee chairman. The size and representation by various interests will be defined by the NCWM Chair on a case-by-case basis. Members of a steering committee should be dedicated to impartial evaluation and reporting on behalf of the steering committee.
- c) **Charge:** The NCWM Chair will define and document the charge of a steering committee and may establish a deadline.
- d) **Operation:** A steering committee has available to it all opportunities to meet electronically between regularly scheduled meetings of the larger group and may also request meeting space in conjunction with NCWM **Winter and Summer Interim and Annual** Meetings. NCWM provides conference call, web meeting and group email services.

- e) **Decision Process:** All appointed participants of the Steering Committee shall participate in the development of and the vote on final reports as they are developed. If a consensus cannot be reached, the vote shall be reported in a manner that shows the count according to stakeholder interest.
- f) **Reporting:** A steering committee will report to the Board of Directors or standing committee as designated by the NCWM Chair upon forming the committee. Progress reports will be, at a minimum, twice per year at Interim and Annual Meetings. Upon completion of its study, a steering committee will provide a comprehensive and unbiased final report of the issue, including all considerations for and against various aspects of the issue so that the voting membership will fully understand the complexities and impacts of any decisions that are made when forming their positions.
- g) **Recognition:** Steering committees are formal components of the NCWM structure and are recognized on the NCWM Organization Chart during the term of their operation.
- h) **Dissolution:** The NCWM Chair may dissolve the task group upon completion of the initial charge or at the request of the Standing Committee.

4. Subcommittee:

- a) **Purpose:** Provide ongoing support for a standing committee for standards in a specific subject area requiring specialized expertise on a regular basis as issues are brought forward.
- b) **Formation:** A subcommittee may only be formed by the NCWM Board of Directors. The NCWM Chairman will make all appointments, including the designation of a subcommittee chairman. The size and representation by various interests will be defined by the Board of Directors on a case-by-case basis.
- c) **Charge:** The subcommittee will assist in developing and making recommendations to agenda items as assigned by the standing committee. Additionally, a subcommittee may bring new agenda items directly to the standing committee relevant to the subcommittee's subject matter.
- d) **Operation:** A subcommittee has available to it all opportunities to meet electronically between regularly scheduled meetings of the larger group and may also request meeting space in conjunction with NCWM **Winter and Summer Interim and Annual** Meetings. NCWM provides conference call, web meeting and group email services.
- e) **Decision Process:** All appointed participants of the Subcommittee shall participate in the development of and the vote on final recommendations as they are developed. If a consensus cannot be reached, the vote shall be reported in a manner that shows the count according to stakeholder interest.
- f) **Reporting:** A subcommittee will report to the standing committee that it serves. Progress reports will be, twice per year at **Winter and Summer Interim and Annual** Meetings when items are under development.
- g) **Recognition:** Subcommittees are formal components of the NCWM structure and are recognized on the NCWM Organization Chart during the term of their operation.
- h) **Dissolution:** A subcommittee may only be dissolved by the NCWM Board of Directors.

Policy 2.1.1. Observer Registration Fee

Purpose: Establish a first-time observer level of participation at Annual Meetings.

Background: Annual meetings are a tremendous opportunity for persons in the surrounding area to attend, where they are otherwise unable. For example, a weights and measures jurisdiction in the host state may wish to send extra staff members who do not ordinarily attend. Still, the registration costs may be prohibitive for such attendance, depending on budget constraints of that program.

The Board of Directors developed a policy that would provide a discounted level of meeting registration; giving individuals the opportunity to take advantage of the meeting location by witnessing that Annual Meeting process at a reduced rate. However, this discounted rate would come with certain limitations that do not exist with full registration.

In 2004, this policy was expanded to include a reduced registration fee for first-time attendees at Interim meetings, too. It was also amended to extend the reduced registration fee to any first-time attendees, not just those in the immediate region. A clarification was added at that time regarding cost to attend special events.

Policy: Observer Fee at ~~Winter and Summer Annual and Interim~~ Meetings:

1. A one-time reduced fee for first-time attendees to ~~Winter or Summer Annual or Interim~~ meetings.
2. An attendee taking advantage of the reduced registration fee shall not have voting rights.
3. An attendee taking advantage of the reduced registration fee shall pay additional fees associated with special events that are otherwise included in the full registration fee.

Policy 2.1.2. Refund Policy

Purpose: To Establish a policy for addressing requests for refund of registration fees for ~~Winter and Summer Interim and Annual~~ Meetings.

Background: As meeting dates approach, commitments are made for food and beverage services and special events. Registration fees are used in part to offset these costs. The Board of Directors recognizes that situations can occur where members may register and then find they are unable to attend. This policy sets the guidelines for determining whether a refund will be granted, and the amount of the refund.

Policy:

1. Requests for refund made prior to the early bird deadline will be subject to a 15% penalty.
2. Requests for refund made after the early bird deadline will be subject to a 50% penalty.
3. Requests for refund after the event has commenced will be denied.
4. Refunds will only be made on registration fees paid to NCWM.

Exceptions:

1. Requests for refund made because of a state-declared natural emergency will be granted in full.
2. Requests for refund due to personal medical emergencies shall be considered based on documentation. In such instances, a full refund may be made.

Policy 2.1.3. One-Day Registration Fee

Purpose: Establish a registration option for those who only choose to attend one day of a conference.

Background: For many years, NCWM provided the option of attending just the Tuesday at a reduced fee of \$100 for members and \$150 for non members. This was primarily to give them an opportunity to attend Tuesday afternoon technical sessions.

As subcommittees and task groups are becoming more common, these groups are requesting meeting space and time slots in conjunction with **Winter and Summer Interim and Annual** Meetings in order to conduct their work and to hear from stakeholders. Some stakeholders would like to participate just in these special meetings without attending the entire conference, but the one-day registration has only been offered on Tuesdays. As a result, staff is put into a position of charging a full conference registration for someone who will only attend for a few hours. This practice can hamper the ability to get quality input by deterring participation of special interest groups or individuals.

By offering single-day registration to facilitate special work group sessions, these same stakeholders will be more likely to register for the full meeting when the developed items come before the membership for comment and action on standing committees' agendas.

Policy: One-day Registration Fee at **Winter and Summer Annual and Interim** Meetings:

1. A one-day registration fee will be offered to stakeholders who wish to attend specific technical sessions or work sessions of task groups or subcommittees.
2. This fee does not provide access to the open hearings, standing committee work sessions or voting sessions of the conference.
3. One-day registration fees shall be \$100 for members and \$150 for non members.
4. An attendee taking advantage of the reduced registration fee shall pay additional fees associated with special events that are otherwise included in the full registration fee.

Policy 2.1.4. Waived Registration Fee for Guest Speakers

Purpose: Allow for waived registration fees under specific circumstances for speakers and presenters at **Winter and Summer Interim and Annual** Meetings.

Background: For the most part, speakers or presenters at **Winter and Summer Interim and Annual** Meetings are members and stakeholders in NCWM. However, on occasion NCWM does invite persons of specific expertise to speak, present, or participate in training or panel discussions who would not otherwise have interest in attending the meeting. In instances like these, it may be deemed appropriate to treat the individual as a guest and waive registration fees.

Policy:

The Executive Director shall have the latitude to waive meeting registration fees for individuals who are in attendance by special invitation to speak, provide a presentation, or training on a specific topic and who would not otherwise be in attendance provided that the individual is only attending the specified session of the meeting.

Policy 2.1.5. Student Registration

Purpose: Establish a Student Pass meeting registration option for qualifying students as an educational opportunity.

Background: NCWM **Winter and Summer Interim and Annual** Meetings can be very educational for young people. By attending our meetings, they can learn about such things as:

- Professional conduct in meetings ranging from task group meetings to voting sessions,
- Interaction between stakeholders of varying interests, or positions on issues,
- Technical matters on the committee agendas,
- Applying rules of order,
- Meeting management and more.

NCWM believes it is important to welcome students as observers upon request and at a reasonable cost. It may even be used for a child of appropriate age to observe a parent in a professional setting and learn more about what they do for their company or agency. The Board of Directors developed the student registration option with these things in mind, but it could also be offered to undergraduate students at local education institutions.

Policy:

1. Students ranging from 7th grade through undergraduate levels may register for a student pass to attend **Winter and Summer interim or annual** meetings at no charge.
2. Students who wish to attend special functions such as receptions, breakfasts, or special events shall pay the normal guest rate.
3. A student pass provides access to all meetings that are available under full registration, but the student shall not participate in the meeting proceedings other than by quietly observing.
4. Students may be asked to leave a meeting if they insist in participating in the proceedings or are otherwise disrupting the proceedings.
5. The website and registration form will advise interested persons to contact NCWM for information on student registration.

Policy 2.2.1. Site Selection

Purpose: To assist NCWM meeting planners in selecting and recommending sites for **Winter and Summer Interim and Annual** Meetings.

Background: One of the considerations in site selection for meetings is the federal government per diem rate established for that area. A significant percentage of attendees are local, state, and federal government employees who qualify for the per diem rate and who are limited to this rate when traveling out of state. When contracts are signed with hotels for meetings, part of the rate negotiation is dependent on the number of sleeping rooms that will be filled by attendees. If the negotiated rate for sleeping rooms is higher than federal per diem, some government employees may reserve rooms at the lower per diem rate. These rooms do not count toward meeting the reserved room block in the contract. This consideration for per diem rates has caused the disqualifications of sites offering rates above the per diem even though the offered rates were less than the per diem in other locations under consideration. The Board also clarified the policy to avoid paying above the per diem rate if that rate drops after the contracts have been signed.

The NCWM also must consider other factors in site selection such as air fare, access from an airport to the hotel, food and entertainment surrounding the hotel, and climate.

Policy:

1. Per Diem rates remain a primary consideration in site selection.
2. Flexibility exists to contract sleeping rooms above per diem if those rates are still considered relatively low (the location must offer value).
3. When contracting at per diem rates, the contract should be worded so that if per diem rates fall prior to the event, the reduction will be represented in the rates actually paid by attendees.
4. A warm location for the **Winter Meeting Interim** is preferable, but this is not a requirement.
5. It is important to review all aspects of the location so that as many people will wish to attend this meeting as possible.
6. Consideration should be given to second tier cities.

Policy 2.3.3. NCWM Meeting Space for Other Groups

Purpose: Define when it is appropriate for NCWM to sponsor meeting space for groups other than those recognized as part of the NCWM structure.

Background: The contracts that NCWM secures for **Winter and Summer Interim and Annual** Meetings typically include all meeting space at no charge as long as other required minimums are met such as room nights or food and beverage. At one time, NCWM offered this complimentary meeting space to industry groups that wished to meet in conjunction with NCWM events. That practice was discontinued because of concern that NCWM might have to accommodate every request that was received to avoid being accused of unfair practices. The change in practice has caused industry groups to bear additional costs.

NCWM values the participation of individual companies and their industry associations in the standards development process. Some of these associations have been in place for many years and have demonstrated a commitment to NCWM's mission. NCWM also recognizes that these industry groups or associations can more effectively participate in the process if given the opportunity to gather separately in conjunction with our meetings to discuss technical issues.

This policy establishes specific criteria whereby NCWM may appropriately sponsor meeting space for industry associations and special interest groups who request to meet in conjunction with ~~Winter and Summer Interim and Annual~~ Meetings

Policy:

1. NCWM may sponsor meeting space in conjunction with ~~Winter and Summer Interim and Annual~~ Meetings for industry and special interests groups if:
 - A. The group has established bylaws,
 - B. The group has agendas and meeting minutes demonstrating that it has met in conjunction with NCWM meetings for at least 3 consecutive years,
 - C. The group's mission is complementary to NCWM's mission, and
 - D. The group's activities have benefited NCWM and its stakeholders.
2. All meetings held in space sponsored by NCWM for industry or special interest groups shall be open to participation by any individuals who are registered for the NCWM ~~Winter or Summer Interim or Annual~~ Meeting.
3. NCWM reserves the right to deny sponsored meeting space for reasons including, but not limited to limitations of space available, inadequate advance notice, or failure to meet the criteria established in this policy.
4. NCWM is not responsible for monitoring or enforcing State/Federal anti-trust regulations for attendees of meetings, or groups representing specific industry sectors.

Policy 2.4.1. Committee Work Session Protocol

Purpose: Establish protocol whereby a committee can receive input from observers during work sessions in an appropriate manner.

Background: NCWM standing committees have historically refrained from accepting comments from observers during their committee work sessions at ~~Winter and Summer Interim and Annual~~ Meetings. The rationale has been that all meeting attendees should benefit from stakeholder input during open hearings.

However, there are times when an observer could offer technical clarifications that would make the committee's work session more productive and their decisions more informed. Past policy has made observers hesitant to raise their hand because perception exists that it is bad form. Likewise, committee chairs have been hesitant to call on observers for assistance.

The Board of Directors has determined it necessary to provide clear policy that would enable standing committees to accept input from observers in an appropriate manner during these work sessions as a means of making the committee work more efficient without circumventing due process.

Policy:

1. Committee chairs may accept contributions of technical clarification only from observers during their work sessions.
2. Observers shall not dominate discussions, restate positions from the open hearings, or provide new positions.
3. Committees shall communicate any new information received during work sessions in their addendums so other attendees have opportunity to respond.
4. For consistency, the following prepared statement shall be read out loud by the committee chair at the beginning of each work session and throughout as deemed necessary.

"This is a work session of the standing committee. Observers who wish to contribute technical clarification to assist the committee's decision process shall raise their hand to be recognized by the committee chair. No opinions or positions will be heard from observers during the work session and should be stated publicly during open hearings."

Policy 2.4.2. Training Session Topics

Purpose: Establish the protocol for selecting training ~~to that may~~ occur at NCWM ~~Winter or Summer and Annual~~ Meetings.

Background: The Professional Development Committee (PDC), Board of Directors, and Chairman of the Board have all played various roles in determining the training program for the ~~Winter and Summer Annual~~ Meetings. This has led to some confusion among the parties and a request from the PDC for clarification.

Training falls under the scope of the PDC so it seems appropriate that this committee continue to have a role in identifying key issues for this time slot at the ~~Winter and Summer Annual~~ Meetings. The NCWM Chairman, however, should be able to exercise some authority in setting the agenda for his/her meeting. Past Chairmen have found the input from the PDC very helpful in this effort.

Policy:

1. Following the ~~Winter and Summer Interim~~ Meetings, the PDC shall make recommendations to the NCWM Chairman of topics for ~~the~~ training sessions that may occur at ~~the Annual~~ future ~~Meetings meetings~~.
2. The PDC is not responsible for developing the content of training sessions, but may recommend facilitators.
3. The NCWM Chairman determines what the training program will be for the ~~Winter and Summer Annual~~ Meetings.

Policy 2.4.3. Retired Member Voting Privileges

Purpose: To set forth policy regarding the voting rights of retired members at meetings.

Background: NCWM Bylaws, Article IV, Section 3 – Waiver of Registration and Membership Fees states:

Individuals who have retired after 10 or more years of weights and measures employment in either the public or private sectors, and who have attended at least one **Winter or Summer Annual** Meeting, shall not be subject to the payment of the registration and membership fees.

The Bylaws do not specify whether the waived registration fees apply to NTETC Sector Meetings. It is also not clear if retired members may be appointed to a sector with voting privileges.

Policy:

1. If a person has retired member status as defined in NCWM Bylaws he/she may attend any NCWM meetings including committee and NTETC Sector meetings at no charge.
2. Retired Members shall have the same voting privileges as Associate Members at **Winter and Summer Interim and Annual** Meetings.
3. Persons with retired membership status shall not have voting privileges at NTETC Sector meetings.
4. If a person with retired member status wants to be a member of an NTETC Sector and have voting privileges, he/she shall pay NCWM Associate Membership dues and request appointment by the NTEP Committee Chairman as an Associate Member of the NTETC Sector.

Policy 2.4.4. Committee Work Schedules

Purpose: Create a policy that clearly defines the duties and work schedules of NCWM standing Committees during the course of **the Winter and Summer Annual** Meetings.

Background: It is necessary that committees adhere to a strict schedule at **the Winter and Summer Annual** Meetings to meet the needs of the organization and its members. Many individuals and companies invest to attend and participate. Committees must be conscientious of the weekly schedules including work sessions, open hearings, and publication deadlines. This policy provides that guidance.

POLICY:

Times are listed in the **Winter and Summer Annual** Meeting **Brochures Brochure**, NCWM Publication **16w/15w and 16s/15s**. Room assignments will be posted on-site as well as in the **version of** NCWM Publication 16 provided at registration.

A. PRIOR TO **THE WINTER AND SUMMER MEETINGS ANNUAL MEETING** – COMMITTEE TECHNICAL ADVISORS AND CHAIRS

1. Any material that a Standing Committee plans to add as part of its Addendum Sheets, including appendices, reports or other multi-page segments, should be completed and reproduced prior to the **Winter and Summer Meetings Annual Meeting**.
2. Make 200 copies of any document using the color-coding shown in the printing schedule. This will save time and printing costs and reduce the workload during the **Winter and Summer Meetings Annual Meeting**.
3. Update all report items with the latest data as an electronic file. The NCWM standard is to use

Microsoft Office Word with the font Times New Roman 10 pt – proportional spacing.

4. Bring back-up reports (hard copy and electronic) with you or arrange to have them sent to the **Winter and Summer Meeting sites Annual Meeting site**.
5. Please let NCWM staff know of any audiovisual needs via e-mail at **info@ncwm.com** **info@ncwm.net** or 402-434-4880.

B. SUNDAY: AGENDA REVIEWS

1. Review the status of all agenda items and discuss any correspondence or comments received after the **previous meeting Interim Meeting**.
2. Develop general plans and procedures for working sessions on Sunday, Monday and Tuesday and the Voting Session on Wednesday and Thursday. Plans should include how to handle controversial issues with alternative strategies.
 3. Plan coordination with other Committee(s) / Presiding Officer (s). Identify any non-technical business items and notify the NCWM Chairman.

WHO ATTENDS

1. Standing Committee Members and Technical Advisors
2. Registered Delegates

EXECUTIVE SESSION

A Standing Committee may decide to make part of its session an "Executive Session" (closed), but this is only permitted for highly sensitive matters, such as those involving proprietary information. **The Standing Committee must request approval by the NCWM Chairman or Chairman-Elect and post this information on the Standing Committee meeting door and at the registration desk.** The Conference discourages any Committee from making their entire Sunday session an "Executive Session" unless notice was given in the **Winter or Summer Annual Meeting Brochure** or NCWM Publication **16w/15w or 16s/15s**. Sunday is the first day of the meeting and NCWM Members may have made their travel arrangements so that they can attend the Sunday reviews. Whenever possible, an Executive Session should be delayed until later in the week so that the 24-hour notice can be given and posted.

C. MONDAY / TUESDAY

1. **Publication 16w or 16s Interim Meeting** Report Presentation (Voting Items)
 - a. Introduce the Standing Committee Members.
 - b. Explain how the report will be presented based on the prepared outline.
 - c. Present **Interim Meeting Report** proposed changes **to Publication 16w or 16s**.
 - d. Solicit comments on **Publication 16w or 16s the Interim Meeting Report** and proposed changes.
 - e. Identify items and issues for **the** future study and maintain the list for use in

the Final Report.

- f. If you have speakers lined up, describe your planned procedure (i.e. time limit per speaker, how you will handle questions, etc.).
- g. Information acquired at the Open Hearings is used by the Standing Committee Members in the development of their Addendum Sheets to **Publication 16w or 16s the Interim Meeting Reports.**
- h. Standing Committees positions should not be announced until after deliberations are concluded. However, the Committee Chair may reassure the audience as to the direction they intend to follow if the Standing Committee has reached a conclusion prior to this presentation. Standing Committee presentations may be preceded with handouts explaining the position of the Standing Committee so that the audience can gain a better understanding of the issue.

ADDENDUM SHEETS FOR PUBLICATION 16W OR 16S TO INTERIM REPORTS

1. Standing Committee Chair, Members and Technical Advisor(s) prepare Addendum Sheets after **all** the Open Hearings have concluded for all Standing Committees **with Voting Items before them.**
2. Develop a Consent Calendar of non-controversial Voting Items.
3. Identify Voting Items that should be voted upon separately.
4. Positions and specific language for Addendum Sheets are developed by Standing Committee Members and the Technical Advisor(s) as follows:
 - Agree on language and recommendations
 - Formally approve Addendum Sheets by recorded vote
 - Prepare and review Addendum Sheets
 - Standing Committee Chair reviews and signs the Addendum Sheets
 - NCWM staff arranges for the Addendum Sheets to be printed

ADDENDUM SHEETS PRINTING SCHEDULE

Addendum Sheets must be given to NCWM Staff, on provided flash drive, by **8:00 am. 5:00 p.m.** Tuesday.

The following color coding will be used when printing the Addendum Sheets:

Specifications and Tolerances CommitteeGreen

Laws and Regulations CommitteeBlue

Board of Directors.....Goldenrod

NTEP CommitteePink

Professional Development Committee.....Cream

D. WEDNESDAY / THURSDAY

Voting Order for Standing Committee Reports / Committee Reference Keys

1. Professional Development Committee – 400 Series
2. Specifications and Tolerances Committee – 300 Series
3. Laws and Regulations Committee – 200 Series
4. National Type Evaluation Program Committee – 500 Series
5. Board of Directors – 100 Series
6. Nominating Committee – 800 Series

VOTING PROCEDURES

1. See Bylaws for details.
2. See "Robert's Rules of Order"

PRESENTATION PREPARATION

Standing Committee Chair prepares for presentation with assistance from the Standing Committee Members and Technical Advisor(s):

1. Determine the sequence and grouping of items and present them on Addendum Sheets. Voting Items that are expected to be non-controversial will have been grouped into a single Consent Calendar.
2. ~~Information items and voting items are to be identified separately in the Interim Report. However, the The~~ Standing Committee may ~~downgrade~~ **change the category of** any **Voting** item prior to making a motion for vote. ~~Information items may not be changed to voting items at the Annual Meeting. Items not assigned a Voting status at the previous meeting are ineligible to be voted on unless the item meets the requirements of NCWM Policy 3.3.2. Section E. Exceptions to Policy Submission of Items to the NCWM Committee Agenda; Submission of "Priority" Items.~~
3. Prior to Wednesday, 12 p.m. prepare an outline of the report and how motions are to be presented by the Standing Committee Chair.
4. The Consent Calendar will be handled first, followed by the separate Voting Items and then the report as a whole. The Standing Committee Chair may present the individual Voting Items in any sequence and is responsible for ensuring that all items are covered.
5. As each item is presented, announce the item number, the corresponding page number in the **report Interim Report** and the page number in the addendum sheets.

REPORT PRESENTATION

Great care must be taken to make sure all items are adequately covered and clearly presented.

The Standing Committee Chair Will:

- Introduce the Standing Committee Members
- Explain how the report will be presented based on the prepared outline

- Ask whether any items on the Consent Calendar should be removed for an individual vote
- Read and explain changed items for clarity
 - Note: Those items in the **report Interim Report** not amended or changed and printed on the Addendum Sheets may be read by title and acted on without a complete reading of the items.
- Make a motion for the adoption of the Consent Calendar as a single voting item
- Make a motion for adoption of each voting item not included in the Consent Calendar

Following each motion by the Standing Committee Chair, the Presiding Officer Will:

- Restate the motion, ask for a second to the motion
- Ask for discussion
- Call for the vote per NCWM voting procedures
- Announce the result

After completion of all voting items, the Standing Committee will make a motion to adopt the report of the Standing Committee in its entirety and authorize the Executive **Director Secretary** editorial privileges.

The Parliamentarian:

- Will be seated with the Standing Committee
- Rules only when asked by the Presiding Officer

VOICE VOTES ON NCWM, INC. BUSINESS ITEMS

The Board of Directors Report and Nominating Committee Report are taken as Voice Votes, unless designated otherwise by the Chairman.

SELECTING NEXT YEAR'S STANDING COMMITTEE CHAIR

After Standing Committee appointments are announced, Standing Committee Members should meet to select next year's Standing Committee Chair. This selection may be made with or without the Technical Advisor(s), but they should be informed as soon as possible.

Policy 2.4.5. Written Testimony

Purpose: To create a consistent method of making written testimony a part of the permanent record.

Background: Stakeholders have the option of providing written testimony, either from the floor during open hearings, or through correspondence with the committee prior to **a Winter or Summer an Interim or Annual** Meeting. Information received by committees in this manner can have a profound effect on the decisions the committee makes regarding specific items on their agendas, yet the general membership has not always had the opportunity to receive the information and gain the same level of insight.

Policy:

1. The person or office that receives supporting documents will forward them electronically as needed to ensure receipt by NCWM, and the standing committees. NCWM will not maintain hard copies.
2. Upon receipt, NCWM will send an email to the submitter explaining:

- a. NCWM, its committees, and the NIST Technical Advisors have received (list documents)
 - b. NCWM has posted the documents on our website at (provide a link)
 - c. Stakeholders will be notified to check the website for supporting documents.
 - d. NCWM will not publish the supporting documents in *NCWM Publication* ~~16W or 16S 15 or 16~~, but the committee may choose to include them in its report as deemed necessary or appropriate.
 - e. NCWM will not distribute printed copies of the documents at the meeting.
 - f. The submitter is welcome to bring and make available hard copies for attendees of the meeting.
3. The following statement (or a variation of it) will appear in the front of *Publications* ~~16W or 16S 15 and 16~~, at the end of each agenda item.

Additional letters, presentations, and data may have been part of the Committee's consideration. Please refer to [link name] to review these documents.

4. NCWM will archive documents and will provide them on request.

Policy 2.4.6. Electronic Access to Meetings

Purpose: Establish policy for electronic access such as teleconferencing, video conferencing or web meetings as a means of participating in NCWM meetings from remote locations.

Background: For the purpose of this policy, a public meeting is defined as a scheduled and advertised meeting of NCWM or any of its sectors, committees, ad hoc committees, subcommittees, task forces and study groups at a facility where members travel to participate. In addition to these public meetings, it is common for committees, subcommittees and task groups, etc. to organize teleconferences and web meetings in between these regularly scheduled public meetings to continue their work.

NCWM has received occasional requests from individuals who wish to participate in a portion of the discussions of public meetings via telephone or web meeting. The request may seem reasonable since the member would have to pay for travel and lodging to attend only that small portion of a multi-day event. Service plans for teleconferencing; video conferencing and web meetings have limits on the number of participants. NCWM's policy should clarify who is granted access and who is not.

The cost is also of concern. Equipment rental costs, phone line access fees at hotels, and internet access in meeting spaces all typically have costs associated with them and the prices can vary greatly according to the hotel and audio/visual service vendor. The cost could multiply quickly as the practice expands to all public meetings including NTETC Sector Meetings, task group meetings, subcommittee meetings, committee work sessions, and potentially NCWM open hearings and voting sessions.

The policy capitalizes on technology, but sets fair limitations on its use to control costs and expectations.

Policy:

1. NCWM encourages the use of electronic meeting formats by sectors, committees, subcommittees, work groups and task groups when these meetings are scheduled outside of NCWM public meetings. Electronic participation by non-members of the group is denied except by special invitation of the group chair.

2. Members of ad hoc committees, subcommittees, task forces and study groups may electronically access public meetings of those groups if funding and capability is present. Electronic participation by non-members of the group is denied except by special invitation of the group chair.
3. Electronic access is denied for all public standing committee meetings, NTETC sector meetings, NCWM open hearings and voting sessions at entirely in-person **Winter or Summer Interim or Annual** Meetings.
 - a. If the Board of Directors has declared an emergency, and the **Winter or Summer Interim or Annual** Meeting is held entirely, or in part, electronically by internet services, electronic access will be granted to participants who are registered for the electronic sessions.

Policy 2.4.7. Recording Meetings

Purpose: Establish a policy restricting the verbatim recording of NCWM meetings.

Background: In 2011 and 2012, members approached staff with concern for tape recorders at Open Hearings and Voting Sessions of the Interim and Annual Meetings. They worried that attendees would be hesitant to comment freely in meetings out of uncertainty for how their comments might be used. Others requested express permission from staff to be allowed to record the sessions for their own use.

Some states have laws protecting the right to record public meetings. NCWM, however, is not a government organization and is not subject to public meetings laws. One option is for NCWM to disallow recording altogether and continue to recognize minutes and meeting reports as the official records of its meetings. Another option is for NCWM to record all meetings (except Executive Sessions) and charge a cost-recovery fee to anyone who requests a transcript. In this option, attendees would not be allowed to use their own recording devices. A third option is to simply allow any registered attendee to record the meetings for their own use.

NCWM is sensitive to the need for open and honest discussions on some very difficult and even controversial agenda items. The likelihood of maintaining lively and productive debates is hampered when attendees are unsure who is recording a meeting and what their motives are. For these reasons the Board of Directors has established this policy.

Policy:

4. No person, including staff, officers, volunteer leadership, media or attendees shall be permitted to create verbatim recordings using any recording device such as, but not limited to, an audio or video recorder, stenotype or stenographer, in open hearings, standing committee work sessions or voting sessions of the NCWM **Winter or Summer Interim or Annual** Meetings or in any NTEP Sector meetings.
5. Committees, subcommittees, task groups, sectors and the Board of Directors may, upon consent of all present, record conference calls or web meetings held outside of the regular meetings of the corporation. Such recordings may only be used to assist in the preparation of reports or minutes of the meetings.
6. Such recordings shall be permanently disposed of following the preparation of written reports or minutes.
7. NCWM does not recognize video, audio, or stenotype recordings of any type as official records of its meetings. Only the written reports or minutes approved by the committees, subcommittees, task groups, sectors and the Board of Directors are recognized as official records of their respective meetings, hearings, or voting sessions.

8. Meeting registration forms will include the statement, “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.”
9. NCWM reserves the right to record special presentations, awards, and training events.

Policy 2.4.8. Transparency in Representation

Purpose: Provide transparency of representation for comments on NCWM agenda items.

Background: During NCWM open hearings and voting sessions, those who speak are historically asked to state their name and affiliation prefacing their comments. For example, a person may work for a manufacturer, serve as a member of a NCWM subcommittee, and also belong to some other industry association. Such a person states which of these they are representing when they approach to make comments.

The Board of Directors believes this transparency is very important to the audience in understanding the motivation and interest behind testimony received and positions that are taken. They further believe that the practice should be framed in NCWM policy and extended to all NCWM official meetings, not just the **Winter and Summer Interim and Annual** meetings.

Policy:

1. Individuals who submit proposals to NCWM to amend handbooks, bylaws, policies, etc. shall clearly state on the proposal the name of the organization, special interest group or individual that they are representing.
2. Individuals providing written testimony including data, background, expertise, position, etc. shall clearly include the name of the organization, special interest group or individual that they are representing.
3. Individuals providing comment or testimony during official sessions of NCWM shall clearly state the name of the organization, special interest group or individual that they are representing.
4. Official sessions of NCWM are defined as any **Winter or Summer Interim or Annual** meeting and meetings of committees, subcommittees, task groups, or NTEP sectors and includes meetings that are face-to-face, via web meeting, conference call, or in any other form.
5. Individuals who are being paid, or who’s expenses are being subsidized, such as consultants to represent another organization or individual’s positions shall clearly indicate the name of that organization or individual they are representing in the manners outlined in parts 1-3 of this policy.

Policy 2.4.10. **Winter and Summer Annual and Interim** Meetings Held Entirely or In-Part by Internet Meeting Services

Purpose: The Board of Directors may declare an emergency prior to **a Winter or Summer Meeting an interim or annual meeting** allowing all of the meeting to be held electronically or for some to attend in-person and some to attend electronically. The rules below are established to ensure smooth operation of the meeting while allowing all participants an opportunity to fully participate in the presentations, discussions, and decisions as allowed at the normal in-person meeting.

Background: The 2020 global pandemic brought attention to NCWM's need for provisions to conduct business when the Board of Directors deems a significant number of members may not be able to participate at an in-person meeting. The NCWM Chair formed a task group to review bylaws and policies to address the needs of the association in such circumstances. This policy is a product of that effort.

Policy:

5. **Login information.** The NCWM office shall send by e-mail to every registered member of the conference requesting electronic access, in advance of each meeting, the time of the meeting, the URL and codes necessary to connect to the Internet meeting service, and, as an alternative and backup to the audio connection included within the Internet service, the phone number and access code(s) the member needs to participate aurally by telephone. The NCWM office shall also include a copy of, or a link to, these rules.
6. **Login time.** The chair of the conference shall appoint a recording secretary for each session of the meeting. The Recording Secretary shall schedule Internet meeting service availability to begin at least 15 minutes before the start of each meeting.
7. **Signing in and out.** Members shall identify themselves as required to sign in to the Internet meeting service, and shall maintain Internet and audio access throughout the meeting when ever present, but shall sign out upon any departure before adjournment.
8. **Quorum calls.** The presence of a quorum shall be established by audible roll call of the in-person and electronic attendees at the beginning of the meeting. Thereafter, the continued presence of a quorum shall be determined by the online list of participating members, unless any member demands a quorum count by audible roll call. Such a demand maybe made following any vote for which the announced totals add to less than a quorum.
9. **Technical requirements and malfunctions.** Each member participating electronically is responsible for his or her audio and Internet connections; no action shall be invalidated on the grounds that the loss of, or poor quality of, a member's individual connection prevented participation in the meeting.
10. **Forced disconnections.** The chair may cause or direct the disconnection or muting of a member's connection if it is causing undue interference with the meeting. The chair's decision to do so, which is subject to an undebatable appeal that can be made by any member, shall be announced during the meeting and recorded in the minutes.
11. **Voting.** Voting shall be done by the most appropriate means which will be announced at least one week prior to the meeting. The votes by the House of State Representatives shall be displayed to both the in-person and electronic attendees

Policy 2.6.1. Special Awards Established

Purpose: To establish NCWM Special Awards to recognize various levels of contributions and service to NCWM and the weights and measures community.

Background: The Board of Directors determined that an organization such as this needs a means of acknowledging outstanding and selfless service beyond the certificates of appreciation and desk-top awards that may be presented for the routine service to committees, subcommittees, etc. Three awards were created with the goal of representing a progression of importance or significance from one award to the next. The awards were established in 2010, but not formalized in the NCWM Policy Manual until the creation of this policy.

In 2022 the Board of Directors considered and approved proposals to create two additional awards to recognize a broader range of Weights & Measures professionals and their contributions to the goals of the NCWM.

Policy: The following NCWM Special Awards and descriptions are hereby established.

1. NCWM Award for Outstanding Contribution

Qualifications: This award recognizes members that have made notable contributions to the development of NCWM standards, policy, administrative support, or other services deemed worthy of recognition. The recipient will have been a member of the NCWM for at least five (5) years.

Description: The award shall consist of a plaque with dimensions measuring approximately 8" x 10" that includes the NCWM seal, the recipient's name, date of award, signatures of the NCWM Chairman, Executive Secretary, and Executive Director and a brief outline of the contributions that the recipient has made to the NCWM.

2. NCWM Award of Distinguished Service

Qualifications: This award recognizes individuals who have made a long-term commitment of service and leadership to NCWM. Recipients have maintained membership in NCWM for at least ten (10) years and have made significant contributions to the enhancement of the organization as a whole through committee service, important contributions to standards development, served as a resource for knowledge, promoted the vision for the NCWM, or other long-term commitments that have advanced the mission of the NCWM.

Description: The award shall consist of a plaque with dimensions measuring approximately 9" x 12" that includes the NCWM seal, the recipient's name, date of award, signatures of the NCWM Chairman, Executive Secretary and Executive Director and a brief outline of the contributions that the recipient has made to the NCWM.

3. NCWM Lifetime Achievement Award

Qualifications: This award recognizes individuals who are by and large well-known and highly regarded for their outstanding performance and contributions to the NCWM. No more than one (1) award can be granted annually. The recipients have maintained membership in NCWM for at least ten (10) years. Because of the special significance of the Lifetime Achievement Award and recognizing that the recipients are often retired, travel expenses are authorized only in accordance with NCWM Travel Policy as needed for the recipient and a guest with the limitation of one guest room. Nominees are considered based on the following characteristics:

Integrity - Their contributions based on unbiased input in such a manner that members are confident that the only motivation is for the improvement the organization and our work products.

Leadership - Their contribution in leading NCWM Committees, Sub-Committees, Sectors, Task Forces, Ad Hoc Assignments, work as Appointive Officials, or other displays of leadership that have advanced NCWM toward becoming an overall better organization. The individual selected for this award will have displayed sound decision-making capabilities, communication skills, motivational skills, and a tolerance for the views of others.

Description - The award shall consist of a plaque with dimensions measuring approximately 14" x 17" that includes the NCWM seal, the recipient's name, date of award, signatures of the NCWM Chairman, Executive Secretary, and Executive Director, and an appropriate outline of the contributions that the recipient has made to the NCWM.

4. Inspector of the Year

Qualifications: This award recognizes individuals whose primary responsibility consists of Weights & Measures field inspection duties. The nominee will be actively engaged as an inspector. Nominees will be evaluated on notable contributions in the following areas: improving inspection processes or efficiencies, advancing co-workers professional development, providing support and leadership to fellow inspectors, making a positive impact on their inspection program and the regulated community in which they serve. Participation at their respective regional

association and/or NCWM meetings may also be considered. Travel expenses are authorized in accordance with NCWM Travel Policy as needed for the recipient and a guest.

Description: The award shall consist of a plaque with dimensions measuring approximately 8" x 10" that includes the NCWM seal, the recipient's name, date of award, signatures of the NCWM Chairman, Executive Secretary, and Executive Director and a brief outline of the contributions that the recipient has made as an Inspector.

5. Weights & Measures Program of the Year

Qualifications: This award recognizes an outstanding Weights & Measures Program. All state, county, or city Weights & Measures Programs are eligible to be nominated. Nominated programs will be evaluated on contributions to the NCWM, engagement in the formation of technical & legal requirements as adopted by the NCWM, engagement at NCWM **Winter and Summer Meetings Annual and Interim meetings** as well as Regional Association meetings. The nominee will demonstrate positive impact to consumers and businesses in the jurisdiction they reside as a result of their W&M program. The nominated program will also have had active NCWM members for at least five (5) years. Travel expenses are authorized in accordance with NCWM Travel Policy as needed for two program representatives.

Description: The award shall consist of a plaque with dimensions measuring approximately 9" x 12" that includes the NCWM seal, the recipient's name, date of award, signatures of the NCWM Chairman, Executive Secretary and Executive Director and an appropriate outline of the contributions that the recipient has made to the NCWM.

Policy 2.6.2. Special Awards Subcommittee

Purpose: To establish a Subcommittee reporting to the Board of Directors that recommends candidates to receive the NCWM Special Awards.

Background: When the NCWM Board of Directors established special awards to recognize various levels of contributions and service to NCWM and the weights and measures community, it was necessary to develop a structure for how recipients would be nominated and chosen. The Board agreed that a selection committee should be formed to receive those nominations and that the Board of Directors should have final approval.

Policy:

4. Subcommittee Scope: The Scope of the Awards Subcommittee shall be to nominate deserving individuals for special award recognition. Any member of the NCWM, regardless of membership category, and including Awards Subcommittee members, may recommend nominees for Subcommittee consideration. The Subcommittee shall meet either (1) during the **Winter Interim** Meeting or (2) via web meeting or conference call. If meeting using the web or conference call, the Subcommittee shall meet no later than February 1 of each year. The Awards Subcommittee shall document that each nominee meets the qualifications outlined for each award. Nominations for awards will be presented to the NCWM Board of Directors by March 1 of each year
5. Membership: The Chairman of the Awards Subcommittee shall be the Past Chair of the NTEP Committee. The NCWM Chair shall appoint committee members to include one (1) NCWM Active Member from each of the four (4) Regional Associations, and two (2) NCWM Associate Members. The NCWM Chair shall confer with the Executive Committee of each Regional Association and the Chair of the Associate Membership on recommendations for Subcommittee members. All members, other than the Committee Chair, will serve initially for three years. The NCWM Chair shall review membership and may make appointments as deemed appropriate. No committee member will serve for more than five (5) consecutive years.

6. **Nomination Deadline:** Nominations that are submitted from General Membership shall be proposed to the Awards Subcommittee by December 31 of each calendar year. Nominations from Subcommittee Members may be submitted to the Subcommittee prior to or at the time of their **yearly annual** meeting. All nominations will be presented on the appropriate standardized nomination form.

Policy 3.1.4. Voting Results Posted

Purpose: Establish a means of publishing the voting results from NCWM **Winter and Summer Annual** Meetings.

Background: Historically, there has not been established a consistent method of publishing results from the voting sessions of the NCWM **Winter and Summer (previously Annual) Annual** Meetings. Information of interest would include the Committee, the Item, the vote count in the House of Representatives, the vote count in the House of Delegates, and the disposition. This information should be made available as soon as practical following the official voting sessions held during the NCWM **Winter and Summer Meetings. (previously Annual) Annual Meeting.**

Some options that have been discussed include posting on the web site, printing in the next newsletter, and sending out an email to all members with the results.

Policy:

1. Voting results shall be posted within 2 weeks of the conclusion of the **Winter and Summer Meetings Annual Meeting** on the NCWM Website as part of the **Winter and Summer Annual** Meeting Archives.

Policy 3.3.2. Procedures to Modify Handbooks

Purpose: Establish NCWM policy for proposing modifications to NCWM Handbooks.

Background: The following policy formerly existed in the Introduction sections of NIST Handbooks 44 and 130. Since NCWM did not have a policy manual until more recent years, this seemed to be the appropriate place to make the policy readily available for modifying those Handbooks. In 2010, NCWM created a new policy manual based on policy decisions by the Board of Directors over the previous 10 years. With a policy manual in place, the Board believes that the following is more properly placed there than in the NIST Handbooks.

Policy:

A. Submission of Agenda Items – Preamble

NCWM Bylaws require that its officers and committees observe the principles of due process for the protection of the rights and interests of affected parties. Specifically, it requires that the committees and officers: (a) give reasonable advance notice of contemplated studies, items to be considered for action, and tentative or definite recommendations for conference vote, and (b) provide that all interested parties have an opportunity to be heard.

B. Submission Process

Anyone introducing an item to the Committee shall initially use the regional weights and measures associations to consider its merits. Using the regional associations ensures discussion and evaluation of items at the grassroots level by involving the regional members in the development, evaluation, and justification of proposals. The regions include the Central, Northeastern, Southern, and Western Weights and Measures Associations. For information on the regional associations, visit www.ncwm.net.

To submit a proposal, obtain Form 15: Proposal to Amend Handbooks at <https://www.ncwm.com/helpful-forms> or by contacting NCWM via email at info@ncwm.com. Complete the form and submit it electronically in Microsoft Word format to NCWM at info@ncwm.com. Instructions for completing the form are included with the electronic version of this template. To ensure that your proposal is included on the regional meeting agenda, submit no later than **February 15 or** August 15 of **each the** calendar year ~~immediately preceding the calendar year in which the NCWM Interim Meeting where the proposal would first be considered by NCWM is held.~~ **Submissions received prior to February 15 of each calendar year will appear on the regional association agendas and the Summer NCWM Meeting. Submissions received after February 15, but before August 15 of each calendar year will appear on the regional association agendas and the Winter NCWM Meeting.** Regional meeting schedules are available on the NCWM website.
(Amended 2021)

C. Procedures

The NCWM Committee will consider items according to the following procedures:

1. Submit new items to NCWM by **February 15 or** August 15, **for the NCWM Summer or Winter Meetings, respectively.**
2. NCWM will forward new items to regional associations for consideration at their **respective spring or** fall meetings.
3. If the regional associations find merit in the new items, they shall forward them to the NCWM Committees with their recommendations.
4. NCWM committees and subgroups are not required to submit a Form 15 proposal, but NCWM recommends that they do so to allow for regional review and comment whenever possible.
5. NCWM Committees will present the new and carryover items for Open Hearings at the **Summer and Winter Meetings January Interim Meeting.** **Carryover items having had a Developing status for three consecutive years shall automatically be removed from the Committee's agenda for the next meeting. However, such items may be retained on a Committee's agenda and presented during the next Open Hearings so long as a specific request has been made by the Committee Chair to the NCWM Executive Director within 10 days of the conclusion of the meeting during which it appeared for the third time as Developing. Such requests shall not be considered standing requests and must be made following each meeting that an applicable item is to be retained.**

(Amended 2018 and 2021)

D. Criteria for Inclusion on the NCWM Committee's Agenda

1. Any item forwarded to NCWM by at least one regional association and received by **May 1 for the Summer Meeting or** November 1 **for the Winter Meeting** will be automatically placed on the Committee's **Interim** Meeting agenda.
2. Items that have not been submitted to a regional association, but which are submitted to NCWM by **May 1 for the Summer Meeting or** November 1 **for the Winter Meeting**, will be evaluated by the Committee using the criteria in Section E, Exceptions to Policy, and Section F, Committee Agenda.
3. Any proposal received by NCWM after **May 1 for the Summer Meeting or** November 1 **for the Winter Meeting**, but prior to the **next meeting Interim Meeting**, will be evaluated by the Committee according to Section E, Exceptions to Policy and Section F, Committee Agenda. Only those items determined to be a national "priority" will be included on its agenda.
4. Proposals shall be submitted on a Form 15 and shall include:

- a. a concise statement of the item or problem outlining the purpose and national need for its consideration. An electronic copy of the background material and proposed amendment(s) should be submitted in a Microsoft Word format on a CD ROM, DVD, or by electronic mail sent to info@ncwm.net;
- b. background material, including test data, analysis of test data, or other appropriately researched and documented material for the Committee to evaluate when deciding its position or future activity on the proposal;
- c. proposed solutions to problems stated in specific language and in amendment form as changes to Conference documents; and
- d. if a proposal involves a new area of weights and measures activity; practical, realistic, and specific recommendations for laws or regulations to be adopted and test methods to be utilized to provide for proper enforcement.

When proposals are to modify or add requirements to existing publications, such as Handbook 130, Uniform Laws and Regulations in the Areas of Legal Metrology and Engine Fuel Quality, or Handbook 133, Checking the Net Content of Packaged Goods, the proposal should:

- 1) identify the pertinent portion, section, and paragraph of the existing publication that would be changed (e.g., Uniform Method of Sale of Commodities Regulation, Section 8.2, paragraph (b));
- 2) provide evidence of consistency with other NCWM publications such as with other uniform laws and regulations;
- 3) provide evidence of consistency with federal laws and regulations (e.g., U.S. Department of Agriculture [USDA] or Federal Trade Commission [FTC] regulations); and
- 4) relay the positions of businesses, industries, or trade associations affected by the proposal including supporting and opposing points of view.

E. Exceptions to Policy for Submission of Items to the NCWM Committee Agenda; Submission of “Priority” Items

The Committee will use the following criteria to evaluate items that have not been approved by a regional association, but have been received by the **May 1 for the Summer Meeting or** November 1 **for the Winter Meeting** deadline. If an item is received after the **May 1 for the Summer Meeting or** November 1 **for the Winter Meeting** deadline, it will be included on the agenda if the Committee determines that it is a national “priority.”

Criteria for Inclusion on the Committee’s Agenda When No Regional Association Has Approved the Item.

1. Items shall have significant legal impact on weights and measures laws and/or regulations involving:
 - a. court cases/attorney general opinions; or
 - b. preemption by federal statute or regulation; or
 - c. conflicts with international standards; or
 - d. items which could affect health and safety.
2. The Committee may contact parties that are potentially affected by an item (e.g., trade associations, industry, and consumer groups) for comments. The Committee may consider these comments and any other information in determining if the item should be included on its agenda.
3. When the Committee determines that it should consider an item as a “priority” (using the criteria in 1.), the item will be handled in the following manner:
 - a. A “priority” item received prior to the **next meeting Interim Meeting** may be added to the **next meeting Interim Meeting** agenda by a majority vote of the Committee.

- b. A “priority” item received after **a meeting the Interim Meeting** may be added to the Committee’s **next meeting Annual Meeting** agenda as:
 - 1) a discussion item by a majority vote of the Committee; or
 - 2) as a voting item by a majority vote of the Committee and the NCWM Board of Directors.

F. Committee Agenda

1. The Committee will review items that have been submitted and selected by a majority vote to be included on its agenda. The Committee will only include those items that have been:
 - a. approved by at least one of the regional associations; or
 - b. forwarded by other committees, subcommittees, NTETC Sectors, task forces, or work groups, or those items that meet the criteria in Section E, Exceptions to Policy.
2. The Committee will publish an agenda (NCWM Publication **16W and 16S 45**) that identifies the items to be discussed during the **Winter or Summer Interim** Meeting. This agenda will be distributed to members approximately 30 days prior to the meeting. The agenda will be provided upon request to all other interested parties.
(Amended 1998)

G. Winter and Summer Meetings Interim Meeting

1. The Committee shall hold public hearings at the **Winter and Summer Meetings Interim Meeting** for the purpose of discussing and taking comments on agenda items.
2. Upon request, the Committee will provide the opportunity for presentations by government officials, industry representatives, consumer groups, or other interested parties during the **Winter and Summer Meetings Interim Meeting**. Requests to make presentations shall be received by the Committee Chairman or Technical Advisor at least two weeks prior to the start of the meetings.

H. Winter and Summer Meeting Reports Interim Meeting Report

1. Items under consideration by the Committee, and about which the Committee offers comments or recommendations to NCWM to act upon during the **Winter and Summer Meetings Annual Meeting**, will be included in the **Committee Reports Committee’s Interim Report** published in the **Winter and Summer Meeting Programs Annual Meeting Program** and Committee Reports (NCWM Publication **16W and 16S 46**).
2. The **Winter and Summer Meeting Programs Annual Meeting Program** and Committee Reports will be prepared and distributed to Conference members approximately three months prior to the NCWM **Winter and Summer Meetings Annual Meeting**.

I. Classifications for Agenda Items

At the **Winter and Summer Meetings Interim Meeting**, the Committee can classify proposals in one of the following ways:

1. “**Voting**” – These are items the Committee believes are fully developed and ready for final consideration by the established due date for final committee reports. Each item has either received majority support from the Committee or the Committee has reached agreement that it is ready for voting status to let NCWM membership decide.

2. **“Informational”** – These items are deemed by the Committee to have merit. They typically contain a proposal to address the issue and a meaningful background discussion for the proposal. However, the Committee wants to allow more time for review by stakeholders and possibly further development to address concerns. The Committee has taken the responsibility for any additional development of Informational items.
3. **“Developing”** – These items are deemed by the Committee to have merit but are found to be lacking enough information for full consideration. Typically, the item will have a good explanation of the issue, but a clear proposal has yet to be developed. By assigning Developing status, the Committee has sent the item back to the **submitter source** for further development. The Committee Report will provide the **submitter source** with clear indication of what is necessary to move the item forward for full consideration. The item will be carried in the Committee agenda with contact information for the **submitter person responsible** for the development. The Committee will take comments on Developing items during **the Winter and Summer Meetings open hearings of the Interim Meeting**, starting with the **submitter developer** if available. **The submitter is also expected to lead the gathering of information for the item and in between meetings work with those who have comments to bring the item to a fully developed status.** The **submitter Developer** may submit updates for inclusion in **Publication 16W or 16S Publication 15** no later than November 1 **or April 1, respectively, and in Publication 16 no later than April 1**. If the **submitter Developer** cannot meet these deadlines for publication, the **submitter Developer** may submit updates in writing to the Committee for consideration and possible inclusion in the next Committee Report.
4. **“Assigned”** – These items are deemed by the Committee to have merit but are found to need further enhancement before being considered by the Committee. Typically, the item will have a good explanation of the issue, but a clear proposal has yet to be developed and the committee thinks further development should be conducted by a subcommittee, steering committee or task group. The Committee Report will provide the **assigned designated** group with clear direction and expectations. The item will be carried in the Committee agenda and will include contact information for the chairperson of the **assigned responsible** subcommittee, steering committee or task group. An assigned item will be returned to the Committee when the responsible group believes the item is fully developed or that no further progress can be made in developing the item. A Committee may revoke the assigned status at any time. The Committee will take comments on Assigned items during **the Winter and Summer Meetings open hearings of the Interim Meeting**, starting with the **responsible party developer**, if available. **The assigned group is also expected to lead the gathering of information for the item and in between meetings work with those who have comments to bring the item to a fully developed status.** The **assigned group assigned group** shall submit their final recommendations to the Committee for consideration and possible inclusion in the next Committee Report.
5. **“Withdrawn”** – These are items that the Committee has found to be without merit **or if no progress has been made by the developer pursuant to Section C. Procedures**. The Committee's determination to withdraw should not be based on the Committee's opinion alone, but on the input received from stakeholders **regarding merit**. The Committee's report will contain an explanation for the withdrawal of the item. Once an item appears in NCWM Publication **16W or 16S 46** as Withdrawn, the status of that item may not be amended, and no further testimony will be received. The item may be reintroduced through the regional associations for consideration as a new item.

(Amended 2021)

At the **Winter and Summer Meetings Annual Meeting** the Committee may:

1. Change the status of the items, but no item may be changed to Voting status because the item has not been published, as such, in advance of the meeting.

2. Amend voting items during the **Winter and Summer Meetings Annual Meeting** based on additional information received following the **previous meeting Interim Meeting** and testimony received at the **meeting Annual Meeting**. These items may also be amended by the voting membership during the voting session of the **Winter and Summer Meetings Annual Meeting** following the procedures outlined in the NCWM Bylaws.
 3. Remove items from the voting agenda at the **Winter and Summer Meetings Annual Meeting** by changing the status prior to a call for the vote of the NCWM membership.
 4. Take testimony on Developing items which will be limited to an update from the person developing the item.
 5. Take testimony on Assigned items which will be limited to an update from the representative of the responsible group.
- (Amended 2013, 2018 and 2019)

J. Comments on **Interim Reports**

1. Weights and measures officials, industry representatives, and all others are encouraged to submit written comments on items in the Committee's **Winter and Summer Reports Interim Report**.
2. All **written** comments on the **Winter and Summer Reports Interim Meeting Report** shall be submitted to the Committee no later than one month preceding the opening of the **next meeting Annual Meeting**.

K. **Winter and Summer Meetings Annual Meeting**

1. The Committee will hold a public hearing at the **Winter and Summer Meetings Annual Meeting** to discuss items on its agenda.
2. Those who want to speak on an item during the public hearing should request time from the Committee Chairman. The Committee Chairman may impose time limits on presentations, the discussion of a question, or the discussion of a proposed amendment.

L. Final Committee Reports and Conference Action

1. Following the public hearings, the Committee will prepare its final report for action by the voting membership of the Conference. Copies of the final report will be provided to the membership prior to the voting session for that report.
2. The Chairman of the Committee will present the final report of the Committee to the Conference body. A vote will be taken on items, proposals, or sections in the report as circumstances require. The Conference will vote on the entire final report as presented in accordance with established Conference voting procedures. Parliamentary procedures according to Robert's Rules of Order, as amended by NCWM Bylaws, shall be adhered to in the presentation of, and any action on, a Standing Committee report.

(Amended 1998)

M. Editorial Changes to the Handbooks

Changes to the handbooks are considered editorial in nature when the change does not alter the technical content or understanding of the handbook and meets the following criteria: 1) the modified text did not change the meaning or procedure outlined, 2) modified text corrected an omission or clarified how the text was written, 3) the item itself was reformatted and relocated in the text to make the organization of the content more meaningful.

N. Publication of the Handbook

NIST may not publish a new edition if it determines that it is reasonable to forego an annual publication (e.g., amendments were minor or editorial in nature) to save printing, mailing, and other costs. If this occurs, NIST will issue a notice that the current edition is still valid and will explain its action. (Note: Section numbering may be changed from one edition of the handbook to another to accommodate additions or deletions.)
(Amended 2008)

Policy 4.1.1. Travel Policy

Purpose: This policy is issued by the National Conference on Weights and Measures (NCWM), Board of Directors to provide guidance to individuals requesting reimbursement for travel incurred while conducting business on behalf of NCWM.

Policy:

Individuals on an NCWM-approved trip will be reimbursed for travel expenditures that are both reasonable and necessary. When conducting business on behalf of NCWM, travel must be conducted in the most cost-effective manner. Travel routing must follow the most direct practicable route. Reimbursement of expenses will be limited to the cost of reasonable, necessary, and cost-effective travel. Members traveling at NCWM expense to NCWM **Winter and Summer Interim and Annual** Meetings are responsible for their own meeting registration fees. All travel shall be approved in advance by the NCWM Executive Director or the Chair of the NCWM Board of Directors.

Procedures:

Procedures for authorizing travel and documenting expenses are designed to ensure adequate control over expenditures of NCWM funds. Requests for reimbursement of expenditures which do not comply with this policy will be denied.

A. Travel Approval

1. Routine travel shall be approved by the Executive Director.
2. If travel is considered out of the normal routine as described in NCWM Policy 4.1.2. Approval of Non-Standard Travel, then prior approval shall be obtained from the Chair of the NCWM Board of Directors.

B. Transportation

1. Private vehicles may be used for official travel when determined to be cost beneficial. The maximum amount of reimbursement will be limited to the lowest cost of airline travel to the same destination over the same dates. Reimbursement for personal vehicle expenses will be made in accordance with the rates established by the Internal Revenue Service as allowable deduction, based on actual miles traveled.
2. Airline travel cost will be reimbursed for regular coach fares. Non-refundable tickets are frequently available at substantial savings if purchased within specified time frames prior to travel. Travelers are encouraged to take advantage of such discounts when possible. However, travelers are responsible for exercising reasonable care and prudence in making the decision to purchase non-refundable tickets to ensure that no expense is incurred for a ticket which is not used.
3. NCWM will reimburse travelers for reasonable ground transportation costs. Receipts for expenditures are required.
 - a. Reimbursement for the use of rental vehicles will be limited to situations where the rental vehicle provides an overall cost savings. Travelers shall obtain prior approval from the Executive Director.

- b. Tips for ground transportation which are reasonable and documented on receipts are considered reimbursable.

C. Lodging

1. The majority of travel will be to destinations where group arrangements have been made for lodging. In instances where individual arrangements for lodging are being made by the traveler, government rates must be requested.
2. Lodging reservations frequently must be guaranteed. If a traveler finds they are not able to fulfill a guaranteed reservation, the traveler is responsible for ensuring the reservation is either changed or canceled to avoid unnecessary charges. If the traveler does not use the reservation and has not changed or canceled it, NCWM will not reimburse the traveler for any resulting charges.

D. Meals and Individual Expenses

1. The cost of meals and incidental travel costs such as personal telephone calls are reimbursed through the per diem rate established by NCWM Board of Directors. Because reimbursement is based on a per diem amount, such expenses should not be itemized on the travel reimbursement form. The current per diem rate is listed in the Rate Schedule below.
2. When 2 or more people who are all traveling at NCWM expense dine together, one person may pay for the group and claim the entire expense by submitting the dining receipt along with names of individuals included in the meal. Alcoholic beverage purchases on a dining receipt are not reimbursable.
3. When meals are provided as part of the event or if the cost of a meal is paid for by another person, the per diem for the day shall be adjusted as listed in the Rate Schedule below.

RATE SCHEDULE

Mileage: Current federal rate as published at: www.gsa.gov/portal/content/100715

Meal and incidental per Diem: \$72.00 per day (includes tips)

Per Diem Adjustments:

Breakfast \$16.00

Lunch \$18.00

Dinner \$38.00

4. Meals are reimbursable on travel days under the following conditions
 - Breakfast – if leaving before 6:00 a.m.
 - Lunch – if leaving before 11:00 a.m.
 - Lunch – if returning after 2:00 p.m.
 - Dinner – if returning after 7:00 p.m.

E. Out-of-Country Travel

In instances involving out-of-country travel, NCWM will authorize travel expenditures with the established per Diem of the federal government.

F. Submitting Documentation for Reimbursement

1. Obtain the most current reimbursement form at <http://www.ncwm.net/resource/forms>.
2. The form is designed to be completed electronically. If completed by hand, use care that penmanship is legible.

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3. Reimbursement checks are mailed to the address on file at NCWM unless another address is specified on the reimbursement form.
4. Submit the form and all receipts to the Executive Director for final approval. Original receipts are not required.
5. Request for Reimbursements shall be submitted in any one of the following ways:

Mail: Don Onwiler
NCWM
1135 M Street, Suite 110
Lincoln, NE 68508

Email: don.onwiler@ncwm.com
Fax: 402-434-4878

Section 2: Agenda (Equivalent to current Annual Meeting format).

NCWM Winter/Summer Meetings
Schedule of Events

(The schedule of events is tentative and subject to change.)

**Committee hearings will occur in the order presented below. Times of each hearing 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. 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.*

Sunday	
8:00 a.m. – 9:30 a.m.	Coffee Service
8:00 a.m. – 5:00 p.m.	Registration and Exhibits
8:30 a.m. – 12:00 p.m.	Meter Manufacturer Association
9:00 a.m. – 11:30 a.m.	Subcommittee and Task Group Breakouts
11:30 a.m. – 1:00 p.m.	Lunch on Your Own
1:00 p.m. – 3:30 p.m.	Fuels and Lubricants Subcommittee
3:30 p.m. – 4:00 p.m.	Joint Committee Meeting
4:00 p.m. – 5:00 p.m.	Agenda Review Professional Development Committee Specifications and Tolerances Committee Laws and Regulations Committee Board of Directors / NTEP Committee
5:30 p.m. – 7:00 p.m.	Chairman’s Reception

2024 NCWM Interim Meeting Agenda
Board of Directors

Monday

7:00 a.m. – 9:00 a.m.	Light Breakfast
7:00 a.m. – 5:00 p.m.	Registration and Exhibits
8:00 a.m. – 8:30 a.m.	New Attendee Orientation
8:30 a.m. – 12:00 p.m.	Official Session – Open Hearings Specifications and Tolerances Committee Laws and Regulations Committee NTEP Committee Board of Directors
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
1:30 p.m. – 5:00 p.m.	Committee Work Sessions (To be announced) Professional Development Committee Specifications and Tolerances Committee Laws and Regulations Committee Board of Directors / NTEP Committee

Tuesday

7:00 a.m. – 9:00 a.m.	Light Breakfast
7:00 a.m. – 5:00 p.m.	Registration and Exhibits
8:00 a.m. – 9:45 a.m.	Official Session – Open Hearings (continued as necessary) Presiding Officer: Ms. Cheryl Ayer, New Hampshire
9:45 a.m. – 10:00 a.m.	Break
10:00 a.m. – 12:00 p.m.	General Session Pledge of Allegiance and Invocation Welcome Address Honorary President’s Address Chairman’s Address Awards Ceremony
12:00 p.m. – 1:30 p.m.	Lunch on Your Own
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
8:00 p.m.	Addendum Sheets Available Registration Area

2024 NCWM Interim Meeting Agenda
Board of Directors

Wednesday

7:00 a.m. – 9:00 a.m.	Light Breakfast
7:00 a.m. – 3:00 p.m.	Registration and Exhibits
8:00 a.m. – 9:00 a.m.	Associate Membership Committee
9:00 a.m. – 12:00 p.m.	Regional Association Meetings Central Weights and Measures Association Northeastern Weights and Measures Association Southern Weights and Measures Association Western Weights and Measures Association
12:00 p.m. – 1:00 p.m.	Lunch on Your Own
1:00 p.m. – 4:30 p.m.	Voting Session Professional Development Committee Specifications and Tolerances Committee Laws and Regulations Committee

Thursday, August 3, 2023

7:30 a.m. – 9:00 a.m.	Light Breakfast
7:30 a.m. – 10:00 a.m.	Registration and Exhibits
9:00 a.m. – 12:00 p.m.	Voting Session (continued as necessary) NTEP Committee Board of Directors Nominating Committee Closing Ceremony Passing of the Gavel / New Chairman's Address Benediction / Adjourn

Section 3: Committee Member Rotations

Currently, the NCWM Chair appoints new committee members at the conclusion of the NCWM Annual Meeting or if the situation warrants at the Interim Meeting or even in between meetings if the need arises. The new Committee member then begins to work with the Committee in preparation for the NCWM Interim (or next scheduled) Meeting.

The proposal to separate Open Hearings into two segments (one for all Voting Items and another for all other agenda items) raised the question of when and how the transition of Committee Members would take place under this scenario. One possibility is for the announcement of new Committee Members by the NCWM Chair to be made at the beginning of the Meeting (e.g., on Monday morning before commencement of the Voting Open Hearings or alternatively during the General Session on Tuesday morning) and once the Voting Open Hearings conclude, the new member would take the place of the outgoing member. This would allow for the new Committee Member to hear all testimony as an active Committee Member during the second Open Hearing Session (for all other items). The outgoing Committee Member would still be responsible for report writing, if any, pertaining to the items that were voted upon.

More than one NCWM Member suggested voting on items immediately after the Voting Open Hearing Session, but upon further review this would not provide the Committees with sufficient time to evaluate testimony, make any necessary changes and have them communicated (through Addendum Sheets or another mechanism) to the membership in a timely manner.

Section 4: Committee Reports

Committee reports following the two national meetings could still be handled in the same manner as they currently are handled. Separating Publications 15 and 16 into all carryover items and all Voting Items, respectively, would not change the report format or deadline(s). Committee member rotations would also not change the report format or deadline. The outgoing member would still be responsible for any aspects related to items considered while on the Committee and the incoming member could be responsible for all information regarding active items before the Committee beginning at the commencement of the Open Hearing Session during which active Committee Membership was designated (i.e., the second Open Hearings for all other agenda items).

Section 5: Open Hearings

Open Hearings (for Voting Items only) could commence on Monday morning and proceed until finished. The Committees could retire into Work Sessions immediately following the Open Hearings for Voting Items. This would typically only apply to the Specifications and Tolerances Committee and the Laws and Regulations Committee unless another Standing Committee had Voting Items on the agenda. Changes made by the Committees based on testimony to be reported on the Addendum Sheets could be provided to NCWM staff by 8:00 am the following morning (Tuesday) and made available to membership at 12:00 on Tuesday in preparation for the Voting Session on Wednesday afternoon (times subject to NCWM office staff approval). The Open Hearings for all other agenda items could begin Tuesday morning following the Opening Ceremonies and proceed until conclusion. Committees could then retire to Work Sessions to evaluate testimony (this would include any new Committee Members and the outgoing Committee Members would not need to be in attendance). It is important to note that Committees are not required to write their entire report by the conclusion of the closing ceremonies. Members are appreciative to know the status of items before leaving the meeting though. To acknowledge this each Committee has the option to discuss the status of each non-voting item and present that summary during their Joint Committee Report on Thursday morning followed by writing the report to its conclusion and submitting the final report by the report due date (approximately 6 weeks following the conclusion of the national meeting).

It is possible that the testimony for Voting Items on Monday may take less time than testimony for all other items. Should this prove to be the case it is possible to move Opening Ceremonies from Tuesday morning to Monday afternoon, which would provide two extra hours for testimony on all non-voting items. The Voting Work Sessions under that scenario could then commence at the conclusion of the Opening Ceremonies on Monday afternoon.

Section 6: Duration for Developing Items

More than one member of the NCWM Membership during the 2023 NCWM Interim Meeting Open Hearings expressed interest in establishing a maximum time limit on each Committee's agenda for Developing Items. No specific duration was conveyed during this testimony. This preference was conveyed in response to the proposal to limit the time for "items that don't pass, but don't fail" to remain on Committee agendas. Following the expressed preferences of NCWM Members who spoke during these Open Hearings the proposed language in the NCWM Bylaws, Article X Voting System Section 9A Voting – Technical Issues was removed and the proposed language in NCWM Policy 3.3.2. Procedures to Modify Handbooks was changed to address Developing Items instead of Voting Items. A period of three consecutive years was inserted for discussion purposes and to solicit membership feedback moving forward. Interested readers should review both scenarios.

Section 7: Interim Meeting Attendance

The question was raised regarding sufficient attendance at the current Interim Meeting (proposed Winter Meeting) to be able to vote. NCWM bylaws require a minimum of 27 votes in both the House of Representatives and House of Delegates for any item to pass or fail. While neither the Board of Directors nor the NCWM can control attendance it is anticipated that attendance will increase at the proposed Winter Meeting due to the occurrence of voting activities. The Focus Group recognizes and appreciates the added cost for attending an additional meeting for those who do not currently attend the NCWM Interim Meeting and for one extra day of travel for those who currently do attend the NCWM Interim Meeting. The Focus Group also hopes those who do not currently attend the NCWM Interim Meeting will begin attending and recognize the importance and benefit of voting twice a year.

The NCWM Interim Meeting has managed an average attendance of 184 registered attendees over the last nine Interim Meetings (including the two virtual events in 2021 and 2022). While it is difficult to determine exactly how many Representatives and Delegates were present at the last Interim Meeting, there were approximately 31 Representatives and 49 Delegates in attendance. This would be sufficient to pass or fail Voting Items pursuant to the voting requirements in the NCWM Bylaws.

In comparison, the NCWM Annual Meeting boasts an average of 214 registered attendees over the last ten Annual Meetings (including the two virtual events in 2021). The last Annual Meeting saw 38 Representatives and 42 Delegates in attendance. There were slightly more Representatives in attendance with equally as many fewer Delegates present when compared to the NCWM Interim Meeting.

Analyzing these data suggest that there is a reasonable assurance that sufficient Active Members would be in attendance to carryout voting under the provisions of the NCWM Bylaws. Further, while there are no guarantees, it is anticipated that this number would increase if voting activities were to commence during the proposed Winter Meeting (i.e., current NCWM Interim Meeting).

Item SPB-23.1 as submitted for the 2023 NCWM Interim Meeting (Original Language)

Articles I-III – No Change

Article IV - Membership Fees and Records

Section 3 – Waiver of Registration and Membership Fees

Individuals who have retired after 10 or more years of weights and measures employment in either the public or private sectors, and who have attended at least one Winter or Summer Annual Meeting (or Annual Meeting if before 2024), shall not be subject to the payment of the registration and membership fees. The spouses of retired members shall enjoy the same privileges as spouses of active members.

Article V – No Change

Article VI – Directors and Appointive Officials

Section 1 – No Change.

Section 2 – No Change.

Section 3 – Nominations and Elections, Parts A, B, C, D

F. Nominating Committee

Each year prior to the Corporation's Winter Interim Meeting, the Chairman shall appoint a Nominating Committee. The Past Chairman will serve as Chairman of the Nominating Committee.

G. Nominations

1. The Nominating Committee shall submit one name for each elective office and present its recommendation as a slate in its report to the Corporation.
2. Additional nominations for officers may be made from the floor at the Summer Annual Meeting provided that prior consent of the nominee has been obtained in writing and presented to the presiding officer at the time of the nomination.

H. Elections

Directors shall be elected during a designated session of the Summer Annual Meeting by a formal recorded vote of the members in attendance and eligible to vote on Corporation motions. See Bylaws, Article X - Voting System

I. Terms of Office

1. The Chairman, Chairman-Elect and Past Chairman shall serve for a term of 1 year. The Chairman-Elect will be elected at the Summer Annual Meeting one year prior to the term of service as Corporation Chairman. After serving one year as Chairman-Elect, the incumbent will succeed to the office of Corporation Chairman. The consecutive reelection of a Chairman and Chairman-Elect is prohibited; however, the eight other directors may be re-elected. The eight other directors shall serve for 5-year terms; except for the Associate Director and Treasurer who shall serve a 3-year term. Elections shall take place at such intervals as are necessary to retain an 11-member Board at all times, except that vacancies shall be filled under Section 3, paragraph E, below.
2. All Directors shall take office immediately following the close of the Summer Annual Meeting at which they were elected.
3. No Change.

J. No Change.

Section 4 – No Change.

Section 5 – Removal of Directors

A director may be removed for cause upon a vote for his or her removal by a majority of the Board at a properly called meeting of the Board. Removal for cause shall include, but not be limited to, failure by the Director to attend two

consecutive meetings of the Corporation. For purposes of this section, two consecutive meetings shall mean Winter or Summer ~~annual or interim~~ meetings of the Corporation.

Section 6 – Appointive Officials

C. No Change.

D. Assumption of Office

All appointive officials shall take office immediately following appointment and will serve through the subsequent Summer ~~Annual~~ Meeting of the Corporation unless otherwise specified by the Corporation Chairman.

Article VII – Duties of the Directors and Appointive Officials

Section 10 – Sergeants-at-Arms

The Sergeants-At-Arms help preserve order during the public sessions of the Corporation's ~~Corporation~~ Winter and Summer Meetings ~~Annual Meeting~~. Their responsibilities include ensuring that only registered delegates are present and that individuals or groups appearing before the Corporation are properly identified.

Article VIII – Meetings of the Corporation

Section 1 – Business Meetings ~~Annual Meeting~~

The Annual Business Meeting of members shall be held at the Summer ~~Annual~~ meeting of the Corporation. However, the Board of Directors may call for a Business Meeting at the Winter Meeting, should it be deemed necessary. Notice of all the business meetings ~~annual meeting~~ shall be given. Notice shall be no less than 10 days before the date of the meeting, except that notice to act on an amendment to the Articles of Incorporation, a plan of merger, a proposed sale of assets or the dissolution of the Corporation shall be given not less than 25 days before the date of the meeting.

The agenda for this meeting shall include the election of the Board of Directors and reports from the Chairman and the Treasurer.

Section 2 – Technical Meetings

The ~~Annual~~ Technical Meeting shall ~~also~~ be held at the Winter and Summer Meetings ~~Annual meeting~~ of the Corporation and may include reports from various committees, task forces, study groups, and other items pertinent to the Corporation, as well as the presentation of technical papers, discussions, displays, education ~~entertainment~~, or other events at the discretion of the Board of Directors.

Section 3 ~~Section 2~~ – Board of Directors and Standing Committee ~~Interim~~ Meetings

~~The Interim~~ Meetings of the Board of Directors and those Standing Committees designated by the Chairman shall be held ~~annually~~, approximately 6 months prior to the next meeting ~~Annual Meeting~~ in order to develop the agenda and committee recommendations to be presented to and acted on by the membership at the next meeting ~~Annual Meeting~~.

Section 4 ~~Section 3~~ – Conduct of Summer ~~Annual~~ and Winter ~~Interim~~ Meetings

~~The Summer~~ ~~Annual~~ and Winter ~~Interim~~ meetings shall be in-person meetings, excepted only in the event that an emergency is declared by the Board of Directors to allow either meeting to be held entirely or in-part by internet meeting services. Justification and classification of the emergency declaration are at the discretion of the Board and may include, but are not limited to, a pandemic that prevents a significant number of members from participating in an in-person meeting. Such emergency declarations and related determinations to allow internet meetings shall not,

however, be uniquely applied to, or employed regarding, any individual agenda item or any subset of items within a complete meeting agenda. The Board of Directors shall maintain policies for conducting these meetings following the principles of the in-person meetings as closely as possible.

Section 5 ~~Section 4~~ – Other Meetings of the Board of Directors, Committees and Subgroups within the Corporation.

A. No Change.

B. Other Committees and subgroups of the Corporation are authorized to hold meetings at times other than the ~~Summer or Winter Annual~~ Meeting ~~or Interim~~. Meeting by any manner technologically possible, including, but not limited to telephone conference call, web meeting and email. If a committee or subgroup desires to conduct a meeting requiring travel and facilities at the expense of the corporation, such meeting will be subject to approval in advance by the Board of Directors.

Section 6 ~~Section 5~~ – No Change otherwise.

Article IX - Committees

Sections 1-4 – No Change.

Section 5 – Duties and Fields of Operation of Board of Directors and Committees

D. Laws and Regulations Committee

The Laws and Regulations Committee ~~biannually~~ ~~annually~~ presents a report for Corporation action. Its scope embraces all matters within the area of weights and measures supervision including:

the development and interpretation of uniform laws and regulations;

4. the study and analysis of bills for legislative enactment;
5. the establishment and maintenance of published guidelines and other effective means of encouraging uniformity of interpretation and application of weights and measures laws and regulations; and
6. liaison with Federal agencies, State agencies, and other groups or organizations on issues within the purview of the Committee. This role entails explaining, advocating, and coordinating Corporation positions, recommendations, and needs before Federal Government agencies, consumer groups, the associate NCWM membership, domestic and international standards organizations, industry, trade associations, and others. The goals are to provide and solicit information, develop a spirit of cooperation, and promote uniformity with the activities and standards of the NCWM.

E. Specifications and Tolerances Committee

The Specifications and Tolerances Committee ~~biannually~~ ~~annually~~ presents a report for Corporation action.

Its scope embraces all matters dealing with:

5. specifications, tolerances, and technical requirements of any kind relating to scales, weights, measures, and weighing and measuring devices and accessories, including interpretation of such material whenever necessary,
6. standards and testing equipment for weights and measures officials,
7. procedures for testing commercial equipment, and

8. liaison with Federal agencies, State agencies, and other groups or organizations on issues within the purview of the Committee. This role entails explaining, advocating, and coordinating Corporation positions, recommendations, and needs before Federal Government agencies, consumer groups, the associate NCWM membership, domestic and international standards organizations, industry, trade associations, and others. The goals are to provide and solicit information, develop a spirit of cooperation, and promote uniformity with the activities and standards of the NCWM.

F. Professional Development Committee

The Professional Development Committee ~~biannually~~ **annually** presents a report for Corporation action.

The mission of the Committee is:

To provide leadership to develop and implement uniform, quality weights and measures services in the areas of:

4. effective program management,
5. education, and
6. public relations.

C.1-C.2. No Change

4. Conference Training Topics

The Committee would be the focal point for gathering and recommending workshops or symposia on leadership, management, and emerging issues to be presented during the **Summer and Winter Meetings** ~~Annual Meeting~~. These topics would provide a forum for the exchange of ideas and discussion of changes in the marketplace.

4. Uniformity of Data - No Change

Part D. Nominating Committee

The Nominating Committee annually presents a slate of nominees for all elective offices. The names of these nominees shall appear in the report of the Nominating Committee and shall be published in the Program and Committee Reports for the **Summer** ~~annual~~ meeting of the Corporation.

Parts E-G – No Change.

Article X - Voting System

In the case of business issues relating to NCWM, Inc., as a Corporation, all questions before a meeting of the Corporation are to be decided by voice vote of members of all three houses.

Members of all three houses may speak to all issues on the floor, both business and technical issues. However, the adoption of final reports of committees on technical issues, as well as other technical issues, is to be decided by a formal recorded vote of the active members in accordance with the following voting structures and procedures. The determination as to whether an issue is technical or business shall be made by the Board in accordance with the policies and procedures of the Corporation.

Section 1 - House of State Representatives

D. Official Designation

This body of Active members who are officially designated by their States and are present and registered at the **Winter and Summer Meetings** ~~Annual Meeting~~ shall be known as the "House of State Representatives."

E. Composition

Each State is authorized one official to serve as its representative at the **Winter and Summer Meetings Annual Meeting** of the NCWM. The State weights and measures director, or his or her designee (State or local government official), is the State representative.

The District of Columbia, the Navajo Nation, and the U.S. Commonwealths and Territories that have weights and measures programs similar to those of the States (for example, have followed the uniform laws and regulations and have adopted Handbook 44) are also allowed representatives.

F. Method of Designation

Each representative is specified annually to the Credentials Committee 30 days before the NCWM **Winter and Summer Meetings Annual Meeting**. Accommodation may be made for exceptions to this deadline. An alternate should be named prior to the NCWM **Winter and Summer Meetings Annual Meeting** in case the designated representative cannot attend.

Section 2 - House of Delegates

Official Designation

All other Active members present and registered at the **Winter and Summer Meetings Annual Meeting** (those not sitting in the House of State Representatives) are grouped as a body known as the "House of Delegates."

Section 3 - House of General Membership

Official Designation

This body shall comprise Associate and Advisory members of NCWM, Inc., who are present and registered at the **Winter and Summer Meetings Annual Meeting**. The House of General Membership shall vote, as well as the House of Representatives and the House of Delegates, on all business issues relating to NCWM, Inc., as a Corporation.

Section 4 Minimum Votes Needed for an Official Vote of a House on Technical Items – No Change

Section 5 - Voting Rules

D. Quorum - No Change

E. Proxy Votes

Proxy votes are not permitted. Since issues and recommendations in the committees' ~~interim~~ reports are often modified and amended at the NCWM **Winter and Summer Meetings Annual Meeting**, the attendance of officials at the **Winter and Summer Meetings Annual Meeting** and voting sessions is vital.

C.-F. No Change

Section 6 - Committee Reports – No Change

Section 7 - Amendments and Changes – No Change

Section 8 – Seating - No Change

Section 9A - Voting- Technical Issues

A.-B. No Change

C. **Issue Returned to Committee for Future Consideration If:**

1. The House of Representatives fails to cast the minimum **number of** required votes **for an item to pass or fail**.
2. The minimum **number of** required votes is **received from east-in** each house but one house votes **“yea” yea** and the other house votes **“nay” 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.

And

4. **The chair of the respective Standing Committee makes a specific request in writing to retain the issue on the Standing Committee’s Agenda. The written request shall be sent to the NCWM Executive Director within 10 calendar days following the voting session. The day of the voting session counts as the first day of the 10 days.**

The issue cannot be recalled for another vote at the same **Winter or Summer Annual** Meeting.

Voting on Technical Issues: The 2-House System								
			House of Delegates					
			Majority Vote Yea		Majority Vote Nay		Tie Vote	
			≥ 27 Votes	< 27 Votes	≥ 27 Votes	< 27 Votes	< 54 total votes	≥ 54 total votes
House of State Representatives	Majority Vote Yea	≥ 27 Votes	Motion Accepted	Motion Accepted	Returned to Committee	Motion Accepted	Motion Accepted	Returned to Committee
		<27 Votes	Returned to Committee	Returned to Committee	Returned to Committee	Returned to Committee	Returned to Committee	Returned to Committee
	Majority Vote Nay	≥ 27 Votes	Returned to Committee	Motion Rejected	Motion Rejected	Motion Rejected	Motion Rejected	Returned to Committee
		< 27 Votes	Returned to Committee	Returned to Committee	Returned to Committee	Returned to Committee	Returned to Committee	Returned to Committee
	Tie Vote		Returned to Committee	Returned to Committee	Returned to Committee	Returned to Committee	Returned to Committee	Returned to Committee

An item can only be returned to committee if it meets the criteria in Article X, Section 9A, (C) 1, 2, or 3, and 4.

Section 9B – Voting – Business Issues – No Change

Section 10 - Procedures – No Change

Article XI - Amendments

These Bylaws may be amended, added to, or repealed at any Winter or Summer Annual Meeting of the membership under normal Corporation procedures. Proposed changes must be published in the recommendations of the Board of Directors in its ~~Interim~~ Report (contained in the Program for the Winter and Summer Meetings Annual Meeting, NCWM Publications 16W or 16S Publication 16) and discussed at the open hearing of the Board of Directors at the Winter or Summer Annual Meeting at which said changes will be voted on. Amendments to the Bylaws must be approved by a minimum of a simple majority vote of the general membership in attendance.

SPB-23.2 I Policy 2.4.7. Recording Meetings

Source:

Board of Directors

Purpose:

Provide a recording of open hearings and voting sessions for committees to reference as needed during their work sessions to assist them in capturing testimony in their reports.

Item under Consideration:

Amend NCWM Policy 2.4.7. as follows:

Recording Meetings

Purpose: Establish a policy restricting the verbatim recording of NCWM meetings.

Background: In 2011 and 2012, members approached staff with concern for tape recorders at Open Hearings and Voting Sessions of the Interim and Annual Meetings. They worried that attendees would be hesitant to comment freely in meetings out of uncertainty for how their comments might be used. Others requested express permission from staff to be allowed to record the sessions for their own use.

Some states have laws protecting the right to record public meetings. NCWM, however, is not a government organization and is not subject to public meetings laws. One option is for NCWM to disallow recording altogether and continue to recognize minutes and meeting reports as the official records of its meetings. Another option is for NCWM to record all meetings (except Executive Sessions) and charge a cost-recovery fee to anyone who requests a transcript. In this option, attendees would not be allowed to use their own recording devices. A third option is to simply allow any registered attendee to record the meetings for their own use.

NCWM is sensitive to the need for open and honest discussions on some very difficult and even controversial agenda items. The likelihood of maintaining lively and productive debates is hampered when attendees are unsure who is recording a meeting and what their motives are. For these reasons the Board of Directors has established this policy.

In late 2022, the Board of Directors amended the policy to be effective in 2023, allowing NCWM staff to record Open Hearings and Voting Sessions for use only by committees in developing reports and addendum sheets.

Policy:

10. ~~No person, including staff, officers, volunteer leadership, media or attendees shall be permitted to create~~Other than the exceptions in 1.a. and 1.b. below, all persons are prohibited from creating verbatim recordings using any recording device such as, but not limited to, an audio or video recorder, stenotype or stenographer, in any NCWM meetings, including open hearings, standing committee work sessions or voting sessions of the NCWM Interim or Annual Meetings or in any NTEP Sector meetings.
- a. NCWM staff may make verbatim recordings of open hearings and voting sessions exclusively for use by NCWM standing committees to assist in drafting their reports and addendum sheets.
- i. All recordings or written transcripts shall be in the sole possession of the NCWM Committee Coordinator and shall be destroyed prior to adjournment of the Interim and Annual Meetings.
- b. Committees, subcommittees, task groups, sectors and the Board of Directors may, upon consent of all present, record conference calls or web meetings held outside of the regular meetings of the corporation. Such recordings may only be used to assist in the preparation of reports or minutes of the meetings.
11. NCWM does not recognize video, audio, or stenotype recordings of any type as official records of its meetings. Only the written reports or minutes approved by the committees, subcommittees, task groups, sectors and the Board of Directors are recognized as official records of their respective meetings, hearings, or voting sessions.
12. Meeting registration forms will include the statement, “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.”
13. NCWM reserves the right to record special presentations, awards, and training events.

Previous Action:

New in 2023

Original Justification:

Committee members have requested access to a recording of open hearings that they could reference during work sessions. This would help them to handle gaps or discrepancies in their notes and ensure accurate depictions in their reports.

NCWM policy prohibits verbatim recordings in an effort to promote stakeholders’ ability to provide open and candid testimony without worry of possible repercussions, or having their comments taken out of context. Yet the Board of Directors understands how recordings would benefit the committees if it can be handled in a responsible manner.

The draft revisions are designed to provide the committees with a useful tool while ensuring that recordings are handled in a secure manner and not maintained beyond the intended purpose.

Comments in Favor:

Regulatory:

- Thank you for entering into the 21st century.

Industry:

-

Advisory:

-

Comments Against:

Regulatory:

- Electronic files remain retrievable from the hard drive after hitting delete.
- How would NCWM verify with complete assurance that the transcript is destroyed.

Industry:

- The transcript will become a crutch for committee members, in effect, making their work less efficient.

Advisory:

-

Neutral Comments:

Regulatory:

-

Industry:

-

Advisory:

-

Item Development:

The Board understands the concerns for protecting the confidentiality of a transcript of Open Hearings. It will investigate available technologies that would ease those concerns. There will be no action on this policy until more information is available.

SPB-24.1 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 considering limiting these publications to electronic format.

Previous Action:

New in 2024

Original Justification:

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

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

Comments in Favor:

Regulatory:

Industry:

-

Advisory:

-

Comments Against:

Regulatory:

-

Industry:

-

Advisory:

-

Neutral Comments:

Regulatory:

-

Industry:

-

Advisory:

-

Item Development:

SPB-24.2

Corporate Name Change

Source:

Board of Directors

Purpose:

Provide clarification to the general public that the National Conference on Weights and Measures is not just a meeting, but an organization.

Item under Consideration:

Change the corporation's name as follows throughout the NCWM Bylaws:

National ~~Conference~~Council on Weights and Measures, ~~Inc.~~

Previous Action:

New in 2024

Original Justification:

It is common for individuals and organizations to think that the National Conference on Weights and Measures is meeting, not an organization. Staff has also noticed through communication with members and other stakeholders, that they already use the word "Council." By changing "Conference" to "Council" NCWM could reduce that confusion while retaining the well-known acronym.

NCWM's legal counsel has also suggested dropping "Inc." in the corporate name since it is not required and would simplify the name to the form that it is used.

The Board of Directors is considering this change in name and request feedback from our membership by voicing support or concerns. This change would be a business item requiring a vote of the General Membership in attendance of an Annual Meeting to change the corporate bylaws.

Comments in Favor:

Regulatory:

-

Industry:

-

Advisory:

-

Comments Against:

Regulatory:

-

Industry:

-

Advisory:

-

Neutral Comments:

Regulatory:

-

Industry:

-

Advisory:

-

Item Development:

FIN – FINANCIAL

FIN-1 I Treasurer's Report

Overall, NCWM's financial health is strong and there are no concerns. All financial transactions and balances have been reviewed and deemed to be properly recorded and reported. We will continue to have all finances audited by an independent party after the close of the fiscal year, which runs October 1 through September 30.

Our financial statements accurately reflect NCWM's financial position and performance. We have sufficient liquidity to meet our current and future obligations. Financial performance is in line with expectations based on the current market and is doing well.

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, particularly as we move forward with building our own NTEP laboratory. I recommend we adopt treasurer's report, as presented.

Respectfully submitted by Craig A. VanBuren, Treasurer.

ASSETS	September 30, 2022	September 30, 2023
Current Assets	\$	\$
Checking/Savings		
Associate Member Fund	49,711.74	55,174.62
Certificates of Deposit	740,152.50	405,174.90
Equities	634,866.52	757,009.26
Money Market Fund	121,100.18	344,214.29
Checking	8,113.47	-124,524.29
Savings	16,021.88	78,027.78
Total Checking/Savings	<u>1,569,966.29</u>	<u>1,515,157.56</u>
Accounts Receivable	18,618.96	42,439.44
Other Current Assets	149,341.15	148,847.11
Other Assets	34,702.25	38,789.33
TOTAL ASSETS	<u>1,772,628.65</u>	<u>1,745,233.44</u>
LIABILITIES & EQUITY		
Liabilities		
Current Liabilities	<u>180,837.02</u>	<u>178,394.33</u>
Total Liabilities	<u>180,837.02</u>	<u>178,394.33</u>
Equity		
Designated - Associate Membership	49,711.74	55,167.56
Unrestricted Net Assets	1,686,674.59	1,536,624.07
Net Income	<u>-144,594.70</u>	<u>-24,952.52</u>
Total Equity	<u>1,591,791.63</u>	<u>1,566,839.11</u>
TOTAL LIABILITIES & EQUITY	<u>1,772,628.65</u>	<u>1,745,233.44</u>

Mr. Gene Robertson, Mississippi | NCWM Chairman
Mr. Marc Paquette, Vermont | NCWM Chairman-Elect
Mr. Mahesh Albuquerque, Colorado | NTEP Committee Chair
Mr. Craig VanBuren, Michigan | Treasurer
Mr. Daniel Walker, Ohio | Active Membership - Central
Mr. Jack Walsh, Massachusetts | Active Membership – Northeastern
Mr. Paul Floyd, Louisiana | Active Membership - Southern
Ms. Kevin Schnepf, California | Active Membership - Western
Dr. Matt Curran, Florida | At-Large
Ms. Ray Johnson, Fairbanks Scales | At-Large
Mr. Chris Guay, CGGT | AMC Representative

Mr. Don Onwiler, NCWM | Executive Director
Dr. Katrice Lippa, NIST, OWM | Executive Secretary
Mr. Darrell Flocken, NCWM | NTEP Administrator
Ms. Erica Garnier, Measurement Canada | Board of Directors Advisor

Board of Directors

Appendix A

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

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

The OWM at NIST is responsible for coordinating United States participation in OIML and other international legal metrology organizations. Learn more about OIML at www.oiml.org and about NIST, OWM at www.nist.gov/owm. Dr. Charles Ehrlich, Program Leader of the International Legal Metrology Program, can be contacted at (301) 975-4834 or charles.ehrlich@nist.gov.

Note: OIML publications are available electronically without cost at www.oiml.org.

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Table B
Glossary of Acronyms and Terms

Acronym	Term	Acronym	Term
ANSI	American National Standards Institute	ISO	International Standardization Organization
APEC	Asia-Pacific Economic Cooperation	IWG	International Work Group
APLMF	Asia-Pacific Legal Metrology Forum	LMWG	Legal Metrology Work Group
APMP	Asia-Pacific Metrology Program	MAA	Mutual Acceptance Agreement
B	Basic Publication	MTL	Manufacturers' Testing Laboratory
BIML	International Bureau of Legal Metrology	NIST	National Institute of Standards and Technology
BIPM	International Bureau of Weights and Measures	NTEP	National Type Evaluation Program
CD	Committee Draft ¹	OIML	International Organization of Legal Metrology
CIML	International Committee of Legal Metrology	OWM	Office of Weights and Measures
CTT	Conformity to Type	PG	Project Group
D	Document	R	Recommendation
DD	Draft Document ²	SC	Technical Subcommittee
DoMC	Declaration of Mutual Confidence	SIM	Inter-American Metrology System
DR	Draft Recommendation ²	TC	Technical Committee
DV	Draft Vocabulary ²	USNWG	U.S. National Work Group
GA	General Assembly	VIM	International Vocabulary of Metrology
IEC	International Electrotechnical Commission	VIML	International Vocabulary of Legal Metrology
IQ Mark	International Quantity Mark	WD	Working Draft ³
¹ CD: a committee draft at the stage of development within a technical committee, subcommittee, or project group; in this document, successive drafts are numbered 1 CD, 2 CD, etc. ² DD, DR, and DV: a draft document approved at the level of the technical committee, subcommittee or project group concerned and sent to BIML for approval by CIML. ³ WD: working draft that precedes the development of a CD; in this document, successive drafts are number 1 WD, 2 WD, etc.			

**Details of All Items
(In order by Reference Key)**

I. REPORT ON THE ACTIVITIES OF THE OIML TECHNICAL COMMITTEES

This section reports on recent activities and the status of work in the OIML Technical Committees (TCs), Technical Subcommittees (SCs), and Project Groups (PGs) of specific interest to members of the National Conference on Weights and Measures (NCWM). Schedules of future activities of the TC/SC Secretariats, PG Conveners, the U.S. National Work Groups (USNWGs), and the International Work Groups (IWGs) and Project Groups of the TCs and SCs are also included.

TC 3/SC 5 Conformity Assessment (United States)

Please see the section on the OIML Certification System (OIML-CS), found at the end of this Section of Appendix A.

TC 5/SC 1 Environmental Conditions (Canada)

OIML D 11 *General requirements for measuring instruments - Environmental conditions* is a very important document in the OIML system and is used by all OIML TCs as a general reference for technical and testing requirements on all measuring instruments. Highlights of the previous revision cycle included: expanding the terminology section, updating several testing sections to reflect the latest International Electrotechnical Commission (IEC) reference standards, and including a new environmental class (“E3”) for a non-mains local source of electrical power supply. A new project to revise D 11 was approved by the CIML in Oct 2022, with Canada having responsibility for the Secretariat. Two sets of virtual meetings for the international project group have now been held; the first set were in May 2023 and the second set were in Sept 2023. It is expected that a 1CD will be ready for distribution in the first half of 2024. Please contact Mr. Ralph Richter at (301) 975-3997 or ralph.richter@nist.gov, if you would like additional information on TC5/SC1 or OIML D 11.

TC 5/SC 2 Software (Germany and BIML)

OIML D 31 *General Requirements for Software-controlled Measuring Instruments* serves as guidance for the software requirements in all of the OIML International Recommendations. Because some issues in the last revision cycle in OIML D 31 were not able to be fully resolved, the document entered an immediate revision cycle. A significant part of the new guidance in the revision of D 31 was developed in three subject-area subgroups: Machine Learning, Remote Verification, and Terminology. The 2CD was approved by the PG in Oct 2022. The revised D 31 passed its Preliminary Ballot in April 2023 and received final CIML approval in Oct 2023. Because software issues are rapidly changing, the CIML approved another revision cycle for D 31 at the CIML Meeting in Thailand in Oct 2023. Parties interested in these OIML software efforts should contact Dr. Katya Delak at (301) 975-2520 or katya.delak@nist.gov if they have questions or would like to participate.

TC 6 Prepackaged Products (South Africa)

OIML Guide G 21, entitled “*Guidance for Defining the Requirements for a Certification System for Prepackages*” has been published. This guideline was developed to assist countries in establishing reciprocal agreements to accept the test results on prepackaged goods. The current publication of OIML Recommendation R 87 “*Quantity of Product in Prepackages*” (equivalent to NIST Handbook 133 “Checking the Net Contents of Packaged Goods”) includes a comprehensive overhaul of the statistical requirements and sampling plans. This Subcommittee is continuing its work on a project entitled “R87 Prepackage Template”. TC 6 is also responsible for OIML R 79 *Labeling Requirements for Prepackaged Products*. The TC 6 Technical Committee held a virtual meeting to discuss many of its efforts in March 2023. For more information or to participate in the activities of this committee, please contact Dr. Charles Ehrlich (301) 975-4834 or charles.ehrlich@nist.gov.

TC 8/SC 1 Static Volume and Mass Measurement (United States)

The United States chairs the Project Groups that are revising OIML R 71 *Fixed Storage Tanks* and R 85 *Automatic Level Gages for Measuring the Level of Liquid in Fixed Storage Tanks* to add specific requirements for specialized tanks. The 2CDs of R 71 and R 85 are planned to be distributed soon. The Subcommittee has discussed the importance of revising OIML R 125 *Measuring Systems for the Mass of Liquids in Tanks*, and a project to revise R 125 has been approved by the CIML. Please contact Mr. Ralph Richter at (301) 975- 3997 or ralph.richter@nist.gov, if you would like copies of the documents or to participate in any of these projects.

TC 8/SC 5 Water Meters (United Kingdom)

The current version of OIML R 49 *Water meters intended for the metering of cold potable water and hot water* was published in 2013 after a major multi-year revision effort. A key component of the previous revision effort was to bring the water meter standards from the International Organization for Standardization (ISO) and the European Committee for Standardization (CEN) into full harmonization with OIML R 49. A new revision effort on R 49 began in 2022 with the water meter committees/experts from all three standards organizations participating. In addition to updating and improving the standards, a key goal of the effort is to ensure the three standards remain fully harmonized. Several virtual meetings have been held in 2022 and 2023 to support the rapid completion of this project. The 2CD of OIML R 49 passed its project group vote in June 2023, in parallel with the harmonized 2CD of ISO 4064. The CIML Preliminary Ballot on OIML R 49 closed in Nov 2023. To obtain more information or to participate in this project, please contact Mr. Ralph Richter at (301) 975-3997 or ralph.richter@nist.gov.

TC 8/SC 6 Measurement of Cryogenic Liquids (United States)

The Secretariat for OIML R 81, *Dynamic Measuring Devices and Systems for Cryogenic Liquids* has resolved the comments received on the first committee draft (1CD) of R 81, and a 2CD is anticipated to be distributed soon. To obtain more information or to participate in this project, please contact Mr. Ralph Richter at (301) 975-3997 or ralph.richter@nist.gov.

TC 8/SC 7 Gas Metering (Netherlands)

The OIML R 137 document is especially important to the U. S. interests because the American National Standards Institute (ANSI) B 109 committee on gas measurement is using the published version of R 137 to create a new performance-based standard for gas meters in the United States. A new project to revise R 137 was approved by the CIML in Oct 2022, but work on the R 137 revision has not yet begun.

Starting in 1Q of 2022, The Netherlands has re-started its work on a project to revise OIML R 140, *Measuring systems for gaseous fuels*. When created, this Recommendation was mostly written to cover pipeline systems for natural gas. In addition to general improvements and a significant update for the Recommendation, a focus of the revision project will be to ensure the document fully covers measuring systems for several other gaseous fuels, including hydrogen. A 1WD of R 140 (Part 1) was distributed to the PG in Feb 2023, and a virtual meeting of the project group was held in March 2023. Please contact Mr. Ralph Richter at (301) 975-3997 or ralph.richter@nist.gov, if you would like to participate in any of these TC 8/SC7 efforts or if you would like to obtain a copy of any of these gas measurement documents.

TC 9 Instruments for Measuring Mass (United States)

OIML R 60 *Metrological Regulation for Load Cells* was published in Nov 2021, after the completion of a minor revision (called an “update”) of R60. This update included the removal of a requirement to include the OIML

Certificate Number on each device. For additional information on TC 9 activities, please contact Mr. Ralph Richter at (301) 975-3997 or ralph.richter@nist.gov

TC 9/SC 1 Non-Automatic Weighing Instruments (Germany and France)

A project to revise OIML R 76:2006 *Non-automatic weighing instruments* is in progress. In addition to revising the R 76 Recommendation, the project group has been requested to provide guidance on how to best approach the verification and inspection of measuring instruments in this category. Several Project Sub-Groups have been tasked with reformatting/updating/improving the Recommendation and with developing field verification and inspection procedures for these measuring instruments. Other Sub-Groups are developing proposals for adding up-to-date software requirements and for considering the inclusion of new test procedures for modules. A first Committee Draft (1CD) of the R 76 revision has been developed with assistance from the BIML. Please contact Mr. Ralph Richter at (301) 975-3997 or ralph.richter@nist.gov if you are interested in the effort to revise this document.

TC 9/SC 2 Automatic Weighing Instruments (United Kingdom)

Projects are continuing to revise both OIML R 51 *Automatic catch-weighing instruments* and R134 *Automatic instruments for weighing road vehicles in motion and measuring axle loads*. Both of these Recommendations were last approved/published in 2006, and both of the revision projects are currently in the Working Draft stage. Subcommittee meetings to discuss both of these projects have been held (virtually) in both 2022 and 2023. A Subcommittee meeting was held in June 2023. Please contact Mr. Ralph Richter at (301) 975-3997 or ralph.richter@nist.gov if you are interested in the projects to revise either R51 or R134.

TC 12 Instruments for measuring electrical quantities (Australia)

OIML R 46 *Active Electrical Energy Meters* is undergoing a significant revision, and the comment period on the 1CD package of R 46 closed in April 2023. The Project Group has established several subgroups to work on specific issues related to the revision and the continuing development of R46, including: Quantities and Harmonics (looking at Reactive Energy and the issue of Fundamental vs. Harmonic Power); Smart Street Lighting; DC Metering; and Remote Displays and Meters with Modular Components. A meeting of the R46 Project Group (a joint meeting with the EVSE Project Group, see next paragraph) was held in June 2023 in Delft, the Netherlands.

In Oct 2021, the CIML approved a new (separate) project under TC 12 that is entitled *Electric vehicle charging stations*. This project group is led by the Netherlands, has held several virtual meetings in 2022 and 2023, and has already developed and published a new OIML Guide G 22 *Electric Vehicle Supply Equipment (EVSE)*. This PG is using the newly published Guide as the basis for producing a new OIML Recommendation for this measuring equipment.

At the CIML meeting in Thailand in Oct 2023, the CIML approved another new project under TC 12 for a New Recommendation: “*DC electricity metering*”. The United States will be the Convener for this new project. Please contact Dr. Katya Delak at (301) 975-2520 or katya.delak@nist.gov if you have questions about any of these TC 12 projects or would like to participate.

OIML CERTIFICATION SYSTEM (OIML-CS)

OIML has operated a Certificate System for OIML Type Evaluation of Measuring Instruments since 1991. Because of difficulties encountered by the International Bureau of Legal Metrology (BIML) in adequately obtaining and summarizing peer review and/or accreditation data from test laboratories, and also to promote better awareness of the certificate system, an effort to develop a significantly improved and more robust OIML Certification System (OIML-CS) was started in 2015. After three years of development, implementation of the new OIML-CS began in January 2018. Thirty-seven (37) instrument categories are covered under the OIML-CS; see the OIML website www.oiml.org/en/oiml-cs/categories for the complete list.

The CIML appointed Mr. Mannie Panesar (UK) as the new OIML-CS MC Chairperson for a term of three years that started in January 2021. Dr. Charles Ehrlich (NIST and the U.S. CIML Member) serves on the Management Committee of the OIML-CS. Mr. Darrell Flocken (NCWM/NTEP) serves on the Review Committee, which is now part of the Management Committee.

OIML held its eighth annual OIML-CS Management Committee meeting in March 2023; the meeting was hosted by the Swiss Federal Institute of Metrology (METAS) at its facilities in Bern, Switzerland. The US was represented by Mr. Ralph Richter (NIST OWM) and Mr. Darrell Flocken (NCWM/NTEP) at the meeting with excellent participation that included a diverse international representation overall. Several pressing issues for the Certification System were resolved across a wide range of technical areas.

Details and specifics about the OIML Certificate System are available on the OIML website. If there are any questions about the OIML-CS, or for more information, please contact Dr. Ehrlich at (301) 975-4834 or charles.ehrlich@nist.gov.

II. REPORT ON THE 58TH CIML MEETING IN OCTOBER 2023, MEETING HELD IN CHIANG MAI, KINGDOM OF THAILAND

The Fifty-eighth meeting of the International Committee of Legal Metrology (CIML) was held on 17–19 October 2023 in Chiang Mai, Kingdom of Thailand. Because of the pandemic, this was the first “in-person” CIML meeting since 2019. A quorum was reached with 54 Member States either present or represented.

The CIML President, Dr Roman Schwartz, reported on the key activities and membership changes that had taken place during the year. At the end of his report, he handed over the presidency to Dr Bob Joseph Mathew (Vice-Director of the Federal Institute of Metrology METAS, Switzerland), who was elected for a six-year term at the 57th CIML Meeting in 2022. The Committee thanked Dr Schwartz for his presidential leadership during the period 2017–2023, awarded him an OIML Medal, and made him an Honorary Member. Mr Bill Loizides (Australia) was elected as the CIML Second Vice-President for a six-year-term with immediate effect.

The BIML Director, Mr Anthony Donnellan, reported on the activities and achievements of the BIML and its staff over the previous year. Mr Donnellan’s report emphasized the extensive and critical role that the International Bureau of Legal Metrology (BIML) performs to raise awareness of, and to promote, international legal metrology. The five-year terms of Mr Donnellan and Mr Dunmill (BIML Assistant Director) were renewed by the Committee. The accounts for 2022 were presented and were approved by the CIML. Mr Donnellan reported that the Organization continues to be in a strong financial position, although late payments from Member States and rising inflation continue to be a challenge. He stated that expenses remain generally within expectations, and that the OIML Operating Reserve had not been accessed during this most recent period.

A summary of the detailed discussions held during the Regional Legal Metrology Organisations Round Table (RLMO RT) held in Sept 2023 was presented by the RLMO RT Chairperson, Dr Charles Ehrlich. Organisations in liaison the OIML (including BIPM, IAF, and ILAC) submitted written reports on their activities and CECIP gave an oral presentation.

The BIML gave a report on the progress of the technical work of the Organization that included lists of high-priority projects and publications. The Committee thanked the French and German co-conveners of TC 9/SC 1/p 1 for their work on the revision of R 76:2006 “*Nonautomatic weighing instruments*” and approved the temporary transfer of the convenership of that project to the BIML.

The following publications were approved by the Committee:

- Revision of OIML B 6:2019 “*Directives for OIML technical work (Parts 1 and 2)*”;
- Revision of OIML B 19:2022 “*Terms of Reference for the Advisory Group on matters concerning Countries and Economies with Emerging Metrology Systems (CEEMS AG)*”;

- Revision of OIML D 31:2019 “*General requirements for software-controlled measuring instruments*”;

The following new projects were approved by the CIML:

- Revision of D 31:2023 “*General requirements for software-controlled measuring instruments*”;
- New Recommendation: “*DC electricity metering*”.

Mr Chris Pulham spoke about communication with OIML stakeholders and gave a presentation on the OIML Bulletin, focusing on the highly successful concept of “Mentors” and plans for future editions. He also discussed , including adding a “Letters to the Editor” section and exploring possibilities to introduce more technical, peer-reviewed articles. Members were encouraged to submit topics and articles for future editions.

The OIML Certification System (OIML-CS) Management Committee (MC) Chairperson, Mr Mannie Panesar, reported on the activities of the OIML-CS, including the MC meeting held at METAS, Switzerland in March 2023. He welcomed India as the newest OIML Issuing Authority to join the OIML-CS, and he spoke about plans for the growth and future development of the OIML-CS. Mr Panesar’s term as MC Chairperson and Mr Bill Loizides’ term as MC Deputy Chairperson both come to an end in Dec 2023. Mr Marc Schmidt was appointed as the new MC Deputy Chairperson, and he will take on the role of Acting MC Chairperson for a 12-month period from 1 Jan 2024. It is planned that a new MC Chairperson will be appointed at the 59th CIML Meeting in 2024. OIML R 111:2004 “*Weights of classes E1, E2, F1, F2, M1, M1-2, M2, M2-3 and M3*” has been added to the scope of the OIML-CS.

Mr Jaco Marneweck, CEEMS Advisory Group (CEEMS AG) Chairperson, gave an update on the activities of the CEEMS AG. Mr Chakra Yodmani (Deputy Director General of the Thailand Department of Internal Trade) presented details of the “NEXT” Legal Metrology Systems (LMS) program, called the “Chiang Mai Declaration”. The Committee welcomed this proposal from the Thai Delegation and tasked the CEEMS AG with working on its implementation.

The Chairperson of the OIML Digitalization Task Group (DTG), Dr Sascha Eichstädt from PTB in Germany, reported on the Seminar held on 16 September 2023 “The future of the OIML in the digital era”. The outcome of this Seminar will enable the DTG to develop a roadmap for the OIML’s work in this area.

Concerning OIML activities on e-Learning and other online training, the Committee requested the BIML, in consultation with the DTG, the CEEMS AG, the OIML-CS MC, and the RLMO RT, to draft an e-Learning concept plan that takes into account OIML G 23:2022 “*Guide to the use of online technology for conducting CEEMS activities in a post-COVID world*” and the outcomes of the OIML seminars held in 2019 and in association with the 58th CIML Meeting.

An OIML medal was awarded to Mrs Mairead Buckley (CIML member from Ireland) for her significant contributions to the work of the OIML. Letters of Appreciation were presented to Dr Marko Esche, Mr Han Jianping, Dr Rainer Kramer, and Mr Mannie Panesar for their contributions to the work of the OIML. Two tentative invitations were presented to the Committee to host the 59th CIML Meeting in 2024 in either Japan or P.R. China. The 58th CIML Meeting Resolutions, documents, and presentations are available on the OIML website at <https://www.oiml.org/en/structure/ciml/sites>

III. FUTURE OIML MEETINGS

It is planned that the 59th CIML Meeting will be held in either Japan or P.R.China in October 2024. It is planned to hold the 17th OIML Conference in the year 2025.

IV. REGIONAL LEGAL METROLOGY ORGANIZATIONS

A meeting of the Inter-American Metrology System (SIM) General Assembly is organized annually and is the event where delegates from National Metrology Institutes of the Americas meet to discuss important issues.

The SIM Legal Metrology Working Group (LMWG) held its most recent in-person meeting in Cartagena, Columbia. Several issues of importance to the SIM countries were discussed, including: recent weights and measures training that participants felt had been successful, how the new OIML-CS certification system would affect the weights and measures programs in each country, and the problems that many programs faced concerning adequate and stable access to resources. The meeting closed with a discussion on the future needs and expectations of each of their countries. Possible next steps and planning for future training and future LMWG communication and meetings were considered. Please contact Mr. Ralph Richter at (301) 975-3997 or ralph.richter@nist.gov for more information on SIM and the activities of the SIM LMWG.

A meeting of the Asia-Pacific Legal Metrology Forum (APLMF) was held in Bohol, The Philippines, in Nov 2023. Due to the pandemic, this was the first APLMF meeting that has been held “in-person” since 2019. The US was represented in the meeting by Mr. Ralph Richter (NIST OWM). The APLMF Secretariat has been held by Malaysia since 2020, with Dr. Osman Zakaria serving as the elected APLMF President.

The main objectives of APLMF are to coordinate regional training courses in legal metrology and to provide a forum for exchange of information among legal metrology authorities. APLMF activities continue to be facilitated through its working groups. The most active WG has been the Working Group on Training Coordination. Because of the importance of the training mission to APLMF, this WG has now become a permanent part of the APLMF Secretariat (instead of a separate WG). The results of a recent APLMF survey clearly indicated that the more than 20 courses conducted by APLMF in the last 10 years were highly valued by the member economies, promoted harmonization in the Asia-Pacific region, and frequently led to revised/improved legislation and regulations in the member economies. In 2022, two new APLMF working groups were formed: “WG on Measurement of Fuels” and “WG on Medical Measurements.”

A significant joint project entitled “Metrology Enabling Developing Economies in Asia” (MEDEA) has been conducted over the past several years by APLMF, the Asia Pacific Metrology Programme (APMP) and the Physikalisch-Technische Bundesanstalt (PTB). This project has been managed by PTB and is primarily funded by Germany. The project aims to foster and further develop the capabilities of the APLMF and the Asia-Pacific Metrology Program (APMP) to support developing economies in the Asia-Pacific region, to promote metrology systems within developing economies, and to strengthen the metrology systems/infrastructure within developing economies.

There are currently five APLMF training courses being planned for 2024:

- APLMF/MEDEA Online training course on pre-packaged goods (online);
- APLMF/MEDEA Training course on EVSE (online);
- APLMF/MEDEA Training course on rice moisture measurement (location, TBD);
- OIML/APLMF/MEDEA Seminar on OIML-CS (probably in PR China); and
- OIML/APLMF/MEDEA Seminar on OIML D 1 (probably held in PR China).

The next meeting of APLMF is being planned to held in-person in November 2024 in Taipei City, the capital of Taiwan. Please contact Mr. Ralph Richter at (301) 975-3997 or ralph.richter@nist.gov for more information on APLMF.

Appendix B

**National Conference on Weights & Measures
Associate Membership Committee Meeting Minutes
2023 Interim Meeting
Wednesday, August 2, 2023 Norfolk, VA**

Call to Order: Bill Callaway (Crompco) called the meeting to order at 8:03am EST.

Minutes from last meeting: The Committee reviewed and approved the minutes of the previous meeting from January 2023.

Financial Report: There have been 4 requests for financial support for training. All requests were approved. The criteria for request for financial support are available from the NCWM website. The Associate Member Committee (AMC) bank account has just over \$58k with pending approved payments of \$20, 551.12.

NCWM Committee Reports:

BOD: Mahesh Albuquerque of Colorado, current NCWM Chairman, stated the Board's appreciation for the funds made available for training. The Board is working diligently to promote the funding available for training to the states and regions. There was a discussion about using AMC funds for trade show promotion of the Conference.

The Board continues to develop the Strategic Plan for NCWM.

L&R: Prentiss Searles of API provided an update. There is an open position on the L&R for the Associate Membership. This position is a great way to learn the inner workings of the NCWM process..

PDC: Jim Pettinato of TechnipFMC provided a training update. There is an open position on the PDC for the Associate Membership. The skimmer task group is also looking for leadership.

Old Business:

Training requests:

- Montana LPG Training Application \$2900 Approved
- Hawaii RMAP Training Application \$628 Approved
- Annual NYS W&M Association Training Application \$5000 Approved
- California Hearing Officer & Advocacy training \$7500 Approved

New Business:

Brent Price was nominated for AMC Representative on the L&R Committee.

Perry Lawton was nominated for AMC Representative on the PDC committee.

These nominations carried, and the AMC will recommend these replacements on the respective committees to the incoming NCWM Chair, Gene Robertson (MS).

The meeting was adjourned at 8:55 AM.

Associate Membership Committee (AMC):

Chair: Bill Callaway	Crompco
Vice Chair: Jim Pettinato, Jr.	TechnipFMC
Secretary: Kristy Moore	Growth Energy consultant
Treasurer: Brent Price	Gilbarco
David Boykin	NCR Corporation
David Calix	NCR Corporation
Chris Guay	CCTG
Bob Murnane	Seraphin Test Measure

Respectfully submitted by:
Kristy Moore
AMC Secretary

Laws and Regulations (L&R) Committee 2024 Interim Meeting Agenda

Mr. Mike Brooks, Committee Chair
Arizona

INTRODUCTION

The L&R Committee (hereinafter referred to as the “Committee”) submits this Committee Interim Report for consideration by National Conference on Weights and Measures (NCWM). This report contains the items discussed and actions proposed by the Committee during the January Interim Meeting. The report will address the 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 acronyms for organizations and technical terms used throughout the agenda are identified in Table B. The headings and subjects apply to NIST Handbook 130, “Uniform Laws and Regulations in the Areas of Legal Metrology an Engine Fuel Quality,” and NIST Handbook 133, “Checking the Net Contents of Packaged Goods.” The first three letters of an item’s reference key are assigned from the Subject Series List. The status of each item contained in the report is designated as one of the following: **(D) Developing Item:** the Committee determined the item 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; **(A) Assigned Item:** the committee has assigned development of the item to a recognized subcommittee or task group within NCWM. **(I) Informational Item:** the item is under consideration by the Committee but not proposed for Voting; **(V) Voting Item:** the committee is making recommendations requiring a vote by the active members of NCWM; **(W) Withdrawn Item:** 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. Prior to adoption of the consent calendar, the Committee will remove specific items from the consent calendar upon request to be discussed and voted upon individually.

Committees 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 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.

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, 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 attendees of the conference. If the Committee must discuss any issue that involves proprietary information or other confidential material; that portion of the session dealing with the special issue may be closed if (1) the Chairman or, in 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 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

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
Examination Procedure for Price Verification	PPV Series
NCWM Policy, Interpretations, and Guidelines	POL Series
Handbook 133	NET Series
Other Items	OTH Series

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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 Conference 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-24.1 10.11. *Cannabis* and *Cannabis*-Containing Products.

Source:
Doctors for Cannabis Regulation

Purpose:
Provide states with a universal symbol to clearly identify products containing intoxicating cannabinoids. At present, there are several symbols being used which is an issue right now with multistate *Cannabis* license holders who are required to have different packaging in each jurisdiction. NCWM providing a symbol that states can adopt as they see fit can begin to harmonize under one symbol, which will avoid major headaches in the event of federal legalization.

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

10.11. *Cannabis* and *Cannabis*-Containing Products (See Section 10.11. NOTE)

10.11.1. Definition. – *Cannabis* is a genus of flowering plants in the family Cannabaceae, of which *Cannabis sativa*, *indica*, *ruderalis* are species., and any hybridization thereof. This definition includes products that contain 0.3 percent or less of Total Delta-9 Tetrahydrocannabinol (THC) (also known as Hemp) and products that contain more than 0.3 percent of Total Delta-9 THC (also known as *cannabis*, marijuana, or marihuana).

10.11.2. Labeling. – Any *Cannabis* or *Cannabis*-containing products intended for human or animal consumption or application, shall bear on the outside of the package the following:

- (a) On the principal display panel
1. The statement “Contains *Cannabis*.” The word “*Cannabis*” shall be capitalized and italicized;
 2. The statement “Contains 0.3 % or less Total Delta-9 THC” or “Contains more than 0.3 % Total Delta-9 THC”; and

3. Shall display a *Cannabis* Leaf symbol in accordance with the latest version of ASTM D8441/D8441M Standard Specification for an International Symbol for Identifying Consumer Products Containing Intoxicating Cannabinoids.















Previous Status:
2024: New Proposal

Original Justification:
Uniform product identity is crucial to continue establishing consumer trust and equity in each transaction. We believe it’s important that consumers understand whether a product they are buying contains intoxicating cannabinoids.

1 There are currently 14 different symbols being used in the US, none of which comply with ISO/ANSI standards for
2 warning symbols (table below). The US needs a pathway to uniform intoxicating product identification to solve
3 multistate operator cost of compliance and provide a pathway for a future of interstate commerce.

4
5 ASTM International Technical Committee D37 on Cannabis has developed *D8441/D8441M Standard Specification*
6 *for an International Symbol for Identifying Consumer Products Containing Intoxicating Cannabinoids* (IICPS),
7 which defines specifications for a harmonized graphical symbol that can be used as a means of identifying consumer
8 products containing intoxicating cannabinoids. The symbol is available without having to pay for the ASTM
9 standard by visiting <https://www.dfc.org/universal-cannabis-symbol> or the websites of state agencies who have
10 already adopted it, which are Montana, Vermont, South Dakota, and New Jersey.

11
12 Multi-state operators currently have different symbol requirements, with compliance cost and hassle involved in
13 having to use different symbols in different states. Providing the industry with the option of adopting a symbol based
14 on a consensus standard positions NCWM to become the natural answer to a future of interstate commerce, likely
15 after future federal legalization, making the NIST Handbook 130 the ideal home for reference to a universal symbol
16 that provides states the option to adopt at their own discretion at any pace they like, before or after any federal
17 legalization.

Symbol design	Authorities having jurisdiction (AHJs) using the symbol	Shape of outline (conventional meaning)	Emphasized color (conventional meaning)	Number of colors (including white)	Graphical element (cannabis leaf)	Large graphical element for the visually impaired	Text excluded from interior of symbol	ISO & ANSI compliant
	IIcps: MT, NJ, SD, & VT	Triangle (warning)	Yellow (caution)	2	Yes	Yes	Yes	Yes
	AR	None	None	2	No	No	No	No
	AZ, CO, FL, & OH	Diamond (none)	Red (prohibition)	2	No	No	No	No
	CA	Triangle (warning)	None	2	Yes	No	No	No
	CT, MA, ME, & RI	Triangle (warning)	Red (prohibition)	3	Yes	Yes	Yes	No
	MD	Triangle (warning)	Red (prohibition)	2	Yes	No	No	No
	MI	Inverted triangle (none)	Green (safe condition)	2	Yes	Yes	No	No
	NM	Diamond (none)	Red (prohibition)	2	No	No	No	No
	NV	Triangle (warning)	None	2	No	No	No	No
	NY	Square (none)	Yellow, red (caution, prohibition)	4	Yes	No	No	No
	OK	Rectangle (none)	Red (prohibition)	3	Yes	No	No	No
	OR	Rectangle (none)	Red (prohibition)	3	Yes	Yes	No	No
	WA	Diamond (none)	Yellow, green (caution, safe condition)	4	Yes	Yes	No	No
	Canada	Octagon (stop)	Red (prohibition)	3	Yes	Yes	No	No

1

2 The submitter pointed out the following possible arguments and responses.

3 **NCWM doesn't measure intoxicating cannabinoids, so we shouldn't have to label it.** We think this is not
4 unlike the recently passed regulations requiring "*Cannabis*" to appear on the PDP. Here, we're going further
5 with product identification.

6

7 **The CTG just passed product identification standards. Why this now?** The *Cannabis* industry is dynamic
8 and travels faster than the recently approved standards that were originally submitted years ago

This will conflict with the symbol selected by my state. States have discretion on adoption. Passing this standard allows for maximum flexibility for states to adopt it when they are ready.

The submitter requested Voting status in 2024.

Comments in Favor:

Regulatory:

-

Industry:

-

Advisory:

-

Comments Against:

Regulatory:

-

Industry:

-

Advisory:

-

Neutral Comments:

Regulatory:

-

Industry:

-

Advisory:

-

Item Development:

New Proposal

Regional Associations' Comments:

New Proposal

CWMA 2023 Interim Meeting: Mike Harrington, Iowa commented that this item does not pertain specifically to his state, but he believes it will be federally legalized so supports the standards moving forward. He further commented that states who do not have legal use of cannabis should still be involved in helping develop the standard once it is legalized federally. Chris Guay, CGGT, concurs. He believes having consistency across states is important to establish a benchmark developed by NCWM. Steve Peter, representing himself, concurs and supports the item moving forward. The committee agrees this item is developed and ready for voting status.

WWMA 2023 Annual Meeting: Vince Wolpert, Cannabis Task Group stated there will be changes to the last portion of the statement for products containing intoxicating cannabinoids. Recommends item remains assigned to the Cannabis Task Group. Steven Harrington, Oregon, recommended Withdrawal after testimony was heard from several other regulators.

Matt Douglas, California Department of Agriculture, Division of Measurement Standards, had a general inquiry as to whether this is an identity symbol or a warning symbol. Matt encouraged the submitter to work with the Cannabis Task Group to determine if this is the appropriate place for this item, and recommended this item be assigned to the Cannabis Task Group.

Kurt Floren, County of Los Angeles, California stated he was opposed to this item. Kurt stated he supports Cannabis quantity statements, however does not feel we should be providing warning, as once we step in to regulate warnings, it becomes regular for us to have to do so. Kurt stated that the health issues are better left to health agencies, and that when the federal government moves toward legalization, the FDA and FTC can get involved.

Jose Arriaga, County of Orange, California stated he is in favor of having a harmonizing symbol to identify Cannabis, however does not support cautionary statements, including the word intoxicating.

Joe Moreo, County of Trinity, California stated this should include an identification, a warning, and a potency, since the federal government defines hemp, THC, and Cannabis by potency. Recommended the item be assigned to the Cannabis Task Group.

The WWMA Laws and Regulations Committee recommends this item be Assigned to the Cannabis Task Group.

SWMA 2023 Annual Meeting: The current item under consideration could be interpreted to apply to all *Cannabis*-containing products and the SWMA recommends the following change to clarify that this requirement does not apply to hemp. SWMA recommends the following language for 10.11.2.(a)3. to move forward as Informational to allow for further vetting of the item.

3. If the product contains more than 0.3% Total Delta-9 THC it shall display a Cannabis Leaf symbol in accordance with the latest version of ASTM D8441/D8441M Standard Specification for an International Symbol for Identifying Consumer Products Containing Intoxicating Cannabinoids.

NEWMA 2023 Interim Meeting: Lou Sakin, Holliston, MA, representing the Cannabis Task Group - This is an attempt to standardize (nationwide) a warning symbol on product containing cannabis. Believes the items is ready for voting. He related that the Western Weights and Measures Association recommended it remain as 'Assigned' and that some members feel this is not a weights and measures issue. Many states have different symbols.

Jason Flint, NJ – New Jersey already adopts the symbols and wording. ASTM already uses this labeling and he is in favor of 'Assigned' but would vote yes for it.

Jim Willis, NY - Is not in favor of this item as a 'Voting' item and should stay 'Assigned'.

Jim Cassidy, MA - Feels it should stay 'Assigned'.

Marc Parquette, VA - Vermont agrees it should stay 'Assigned'.

Walter Remmert, PA - Not in favor of this proposal, and in favor of it being 'Assigned'.
The committee recommends this item to be 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.

MOS – UNIFORM REGULATION FOR THE METHOD OF SALE OF COMMODITIES

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

Source:

National Propane Gas Association

Purpose:

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

Item under Consideration:

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

2.16.3.1. Tare weights.

...

(e) **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 the following limits prescribed by 49 CFR § 178.35:

(1) ~~$\pm 1/2\%$ for tare weights of 9 kg (20 lb) or less~~ For a cylinder of 25 pounds or less at the time of manufacture, a lower tolerance of 3 percent and an upper tolerance of 1 percent; or

(2) ~~$\pm 1/4\%$ for tare weights of more than 9 kg (20 lb)~~ For a cylinder exceeding 25 pounds at the time of manufacture, a lower tolerance of 2 percent and an upper tolerance of 1 percent.

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

Previous Status:

2024: New Proposal

Original Justification:

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

- As quoted from the report, “*Initial assessments suggest that cylinder manufactures use a tolerance of 1%, which is primarily based on Measurement Canada’s requirement of 1%.*” If a cylinder’s tare weight can vary +/- 1% from stamped value as manufactured, a cylinder’s actual tare weight cannot be expected to be within +/- 0.5% of the marked value after the cylinder at any point in time thereafter.
- For practical reasons, some manufacturers may use a statistical method to arrive at an average tare weight based on previous measurements of a sufficiently large sample pool. Whatever variance there may be in the actual weight of the cylinder versus the marked tare weight, the fact is that over 98% of the new cylinders weighed were in compliance with the DOT tolerances.

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

Opposing arguments may take the following form:

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

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

Comments in Favor:

Regulatory:

-

Industry:

-

1 **Advisory:**

2 •

3 **Comments Against:**

4 **Regulatory:**

5 •

6 **Industry:**

7 •

8 **Advisory:**

9 •

10 **Neutral Comments:**

11 **Regulatory:**

12 •

13 **Industry:**

14 •

15 **Advisory:**

16 •

17 **Item Development:**

18 New Proposal

19 **Regional Associations' Comments:**

20 New Proposal

21 CWMA 2023 Interim Meeting: No comments were heard.

22
23 Because of no comments, the committee recommends this item be informational.

24 WWMA 2023 Annual Meeting: John McGuire, NIST Office of Weights and Measures, wanted to bring to the attention
25 of the Committee that NCWM petitioned the US DOT to look at the tolerances, and should hold off until an answer
26 is provided by the US DOT. Mr. McGuire stated that he anticipates the response to be sent to the NCWM when
27 completed.

28 Matt Douglas, California Department of Food and Agriculture, Division of Measurement Standards recommended
29 withdrawal, as he felt that the cylinders should be stamped with an accurate tare statement, as the US DOT allowable
30 difference of the stamped tare weight versus the actual tare weight is a safety item. Matt stated that the NCWM
31 requirements are for consumer protection, and are within the US DOT safe ranges, so there is no conflict.

32 Steven Harrington, Oregon stated that he takes no position, however, he asked that the Committee consider adding
33 metric units back to the proposal.

34 The WWMA Laws and Regulations Committee recommends this item be Informational.

35 SWMA 2023 Annual Meeting: Based on comments received during open hearings and the fact the National
36 Conference on Weights and Measures sent a petition to DOT to evaluate tolerances on tare, the SWMA recommends
37 this item be informational awaiting response from DOT.

The committee would like to acknowledge the language recommended by OWM for 2.16.3.1.(c) and as shown below:

- (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:

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

~~(2)ii.~~ $\frac{1}{4}$ % for tare weights of more than 9 kg (20 lb).

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

i. **For a cylinder of 25 lbs or less at the time of manufacture, a lower tolerance of 3 % and an upper tolerance of 1 %; or**

ii. **For a cylinder exceeding 25 lbs at the time of manufacture, a lower tolerance of 2 % and an upper tolerance of 1 %.**

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

NEWMA 2023 Interim Meeting: Steven Timmar, NY - Is concerned that this adversely affects the existing tolerances (increase) and could be a safety issue if the tank is overfilled (relying on the blow off valve).

Jason Flint, NJ - Agrees with New York on this issue. This item shouldn't move forward without receiving response from USDOT concerning their position on the item.

Cheryl Ayer, NH - Agrees with New York and New Jersey.

Walter Remmert, PA & Lou Sakin, Holliston, MA – Believe it should be 'Withdrawn'.

The committee recommends that this item be withdrawn.

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.

MOS-24.3 2.16.3.1. Tare Weights, Part (d) ~~Average requirement.~~

Source:

National Propane Gas Association

Purpose:

Remove an ambiguous and subjective requirement that is based on a statistical approach not clearly defined.

Item under Consideration:

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

2.16.3.1. Tare weights.

...

~~(d) Average requirement. When used to determine the net contents of cylinders, the stamped or stenciled tare weights of cylinders at a single place of business found to be in error predominantly in a direction favorable to the seller and near the allowable difference limit shall be considered to be not in conformance with these requirements.~~

Previous Status:

2024: New Proposal

Original Justification:

Deleting (d) is necessary because the requirement itself is too subjective and not based on a clear compliance threshold. For example, there is no clear indication what “predominantly” means. There is no direction on how many cylinders to test or what statistical methods to employ in determining the meaning of “predominantly.” The Submitter requested Voting status for this proposal.

An opposing argument may be that the paragraph is needed in order to protect consumers from fraud due to a scheme undertaken by sellers or retail propane and the manufacturers of cylinders. The rebuttal to that argument is that in effect, this rule in Handbook 130 is skewed against retail sellers of propane and by its very nature alleges that there is collusion between cylinder manufacturers and retail propane marketers. Such an argument does not take into consideration the variances in raw materials, the tolerances that manufacturers can achieve, or any number of factors that address the very usefulness of a tare weight marking in the modern world of filling a cylinder with liquefied petroleum gas.

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

Comments in Favor:

Regulatory:

-

Industry:

-

Advisory:

-

Comments Against:

Regulatory:

-

Industry:

-

Advisory:

-

Neutral Comments:

Regulatory:

-

Industry:

-

Advisory:

-

Item Development:

New Proposal

Regional Associations' Comments:

New Proposal

CWMA 2023 Interim Meeting: No comments were heard. Because of no comments, the committee recommends this item be informational.

WWMA 2023 Annual Meeting: John McGuire, NIST Office of Weights and Measures, stated that this proposal seeks to remove the average requirements from the Method of Sale. These requirements have been in place since 1990 and were developed in conjunction with the compressed gas association, and were designed with the intent of avoiding complaints from consumers that sellers were misrepresenting the net quantity.

Matt Douglas, California Department of Food and Agriculture, Division of Measurement Standards stated that the need for consumer protection exceeds the justification of this item and recommends withdrawal. The WWMA Laws and Regulations Committee recommends this item for Withdrawal.

SWMA 2023 Annual Meeting: The SWMA does not see any merit in this item and recommends the item be withdrawn.

NEWMA 2023 Interim Meeting: Jason Flint, NJ – Believes the item has no merit and feels it should be ‘Withdrawn’.

Jim Willis, NY- Agrees as does Jimmy Cassidy, MA; Cheryl Ayer, NH; and Walter Remmert, PA.
The committee recommends that this 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.

MOS-24.4 2.16.3.1. Tare Weights, Part (e) Tare Determination.

Source:

National Propane Gas Association

Purpose:

Modify a requirement to recognize the variety of practices that are commonly used to protect valves on cylinders and label cylinders with information.

Item under Consideration:

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

2.16.3.1. Tare weights.

...

- e) Tare Determination. – The stamped or stenciled tare weight shall be used for purposes of verifying the net contents unless the actual tare weight is determined, then the actual tare weight shall be used for purposes of

net content verification. The removable protective cap and label are not included in the stamped or stenciled tare but **must can** be included in the total tare determinations.

Previous Status:

2024: New Proposal

Original Justification:

The modification proposed to (e) is necessary because this text is confusing. Sometimes the protective cap for a cylinder is attached by a plastic lanyard to the valve and is not easily removed. Other times, it is removeable. Sometimes the “label” is actually a sleeve and it must be removed prior to filling the cylinder. Other times it is adhered to the cylinder and cannot be removed easily.

An opposing argument may be that the paragraph is needed in order to protect consumers from fraud due to a scheme undertaken by sellers or retail propane and the manufacturers of cylinders. The rebuttal to that argument is that in effect, this rule in Handbook 130 is skewed against retail sellers of propane and by its very nature alleges that there is collusion between cylinder manufacturers and retail propane marketers. Such an argument does not take into consideration the variances in raw materials, the tolerances that manufacturers can achieve, or any number of factors that address the very usefulness of a tare weight marking in the modern world of filling a cylinder with liquefied petroleum gas.

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

Comments in Favor:

Regulatory:

-

Industry:

-

Advisory:

-

Comments Against:

Regulatory:

-

Industry:

-

Advisory:

-

Neutral Comments:

Regulatory:

-

Industry:

-

Advisory:

-

Item Development:

New Proposal

Regional Associations' Comments:

New Proposal

CWMA 2023 Interim Meeting: No comments were heard. Because of no comments, the committee recommends this item be informational.

WWMA 2023 Annual Meeting: Matt Douglas, California Department of Food and Agriculture, Division of Measurement Standards recommended Withdrawal, as the cap and label have to be considered as either tare, or as part of the product, which is unacceptable.

John McGuire, NIST Office of Weights and Measures concurred with Mr. Douglas, and stated that NIST OWM believes the Method of Sale regulation states that an accurate tare must be stated to determine the net contents declaration.

Kurt Floren, County of Los Angeles, California, stated that he agreed with the previous testimony, and that changing from "must" to "can" was absurd, as it makes more non-uniformity with no benefit.

The WWMA Laws and Regulations Committee recommends this item for Withdrawal.

SWMA 2023 Annual Meeting: The SWMA does not see any merit in this item and recommends the item be withdrawn.

NEWMA 2023 Interim Meeting: Jason Flint, NJ – Is not in favor of this, as it would make the tolerance wider.

Lou Sakin, Holliston, MA – 'Must' means shall; this is mandatory.

The committee recommends that this 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.

**RSA – UNIFORM REGULATION FOR THE VOLUNTARY REGISTRATION OF
SERVICE PERSONS AND SERVICE AGENCIES FOR COMMERCIAL
WEIGHING AND MEASURING DEVICES**

RSA-24.1 Section 4. Voluntary Registration

Source:

Arkansas Bureau of Standards

Purpose:

Add the requirement that a Service Agent or individuals employed by a Service Agency must possess certificates demonstrating basic competency in applying applicable Handbook 44, 130, and 112 requirements.

Item under Consideration:

Amend Handbook 130 Uniform Regulation for the Voluntary Registration of Service Persons and Service Agencies for Commercial Weighing and Measuring Devices as follows:

Section 4. Voluntary Registration

An individual or agency qualified by, **training or experience, and certificate(s) granted by a standards development organization recognized by the Director;** may apply for registration to service weighing devices or measuring devices on an application form supplied by the Director. Said form, duly signed and witnessed, shall include **certification guarantee** by the applicant that the individual or agency is fully qualified to install, service, repair, or recondition whatever devices for the service of which competence is being registered; has in possession or available for use, and will use, all necessary testing equipment and standards; and has full knowledge of all appropriate weights and measures laws, orders, rules, ~~and~~ regulations, **and policies.** An ~~applicant~~ **individual or each individual of an agency** ~~also~~ shall submit appropriate **certificate(s), evidence, or references as to qualifications.** **The certificate(s) shall apply to the types of weighing devices and measuring devices inspected and tested by the individual or agency. Device types without available certificate(s) may be exempted.** Application for registration shall be voluntary, but the Director is authorized to reject or limit any application. (Added 1966) (Amended 1984) **(Amended 20XX)**

Previous Status:

2024: New Proposal

Original Justification:

Mandating an assessment of an individual's knowledge, on weighing and measuring devices, will verify competency and serve as a tool to increase consistency of services offered to owner/operators. This process is inconsistently accomplished, nationwide, throughout jurisdictions.

The addition of this wording was not possible until the recent creation of Registered Service Agent Testing through the National Conference on Weights and Measures (NCWM). By placing the testing and certificates, into a single location(s), jurisdictions will not have to individually implement core knowledge assessment. Note, this DOES NOT restrict jurisdictions from implementing additional testing, which can also be added through NCWM. Centralization of core knowledge testing creates a uniform knowledge assessment that benefits NCWM membership and owner/operators. This knowledge base would then be consistent across the country and membership could change as needed through the Professional Development Committee.

Adoption of this language also serves to guarantee that certificates could be accepted in all jurisdictions, benefitting Service Agents. Core or specific competency requirements could be achieved for multiple jurisdictions at one location or in a shorter time. Alternative proctoring compounds this savings even more by allowing testing almost anywhere. Each of these steps will cut cost and time investment of onboarding. This new testing will give Service Agent's a "one stop shopping" option in demonstrating knowledge and gaining registration in multiple jurisdictions.

The submitter presented the following potential arguments with responses:

Associated Cost – Testing through NCWM will cause a financial burden.

NCWM has set forth to make the testing reasonably affordable. Associated cost for multi-state travel, missed work, technician pay, and others should offset testing cost.

Using the wording "certificate(s) granted by a standards development organization recognized by the Director".

Though NCWM is the only organization to currently have this option available, it is not the intent to preclude certificates from any other organization that may be recognized or those created by jurisdictions. Including only "NCWM certificates" could be seen as limiting the options available in the future.

Immediately being enforceable

Submitter would defer to jurisdictional authority on implementation. Reasonable effort should be given to educate and train Service Agents as to the requirement and location of the testing. Creating effective dates or changing requirements on applications should create reasonable accommodations to the industry. Centralized testing will create an even greater advantage, as Service Agents will only have to accomplish the action once.

1 Difficulty in ability to attain certificate.

2 This may be an unintended consequence that presents itself with opportunity. Inability to pass the test will
3 create an opportunity of jurisdictions to better educate and train those individuals. In turn this creates a better
4 Service Agent and provides more consistent and correct service to owner/operators.

5 Lack of training by Service Agents

6 Another consequence that may present opportunity. This could create a marketplace for training. Whether this
7 is taken up by individual, jurisdictions, industry, or NCWM it could become the catalyst for increasing
8 education and provide higher quality service.

9
10 Lack of mandatory testing for Inspectors

11 Some service companies may take issue with no policy providing for mandated inspector/investigator testing.
12 The model law does not have an inspector provision; therefore, it cannot be amended. Jurisdictions should
13 have training and accountability programs in place to ensure inspector/investigator knowledge. Professional
14 certification through NCWM does not serve as core competency for inspectors/investigators, rather it provides
15 “confidence that an individual has a strong understanding of U.S. weights and measures standards as adopted
16 by NCWM and published in Handbooks 44, 130, and 133” (NCWM website).

17 Service Agent testing is meant to only establish core competency in reading of the handbooks and being able to use
18 the appropriate material when inspecting and testing devices. The certificates issued will NOT be considered
19 “Professional Certification”.

20 Recourse is available by submitting a Form 15 with any proposed changes or creation of model law to include
21 inspector/investigator requirements. Service Agents can go through the exact same process and be heard.

22 The submitter requested Voting status for 2024.

23 **Comments in Favor:**

24 **Regulatory:**

- 25 •

26 **Industry:**

- 27 •

28 **Advisory:**

- 29 •

30 **Comments Against:**

31 **Regulatory:**

- 32 •

33 **Industry:**

- 34 •

35 **Advisory:**

- 36 •

37 **Neutral Comments:**

Regulatory:

-

Industry:

-

Advisory:

-

Item Development:

New Proposal

Regional Associations' Comments:

New Proposal

CWMA 2023 Interim Meeting: No comments were heard.

The committee recommends this item be made informational and needs more input. The committee also questions the definition of “guarantee” by the applicant. The word “verification” may be better suited. This is found in section 4 Voluntary Registration.

WWMA 2023 Annual Meeting: Steven Harrington, State of Oregon, stated that he is not opposed to this item, and that it seems the proposal is trying to take the NCWM exams and build them into model regulations for RSAs. Mr. Harrington stated that he is struggling with line 16 on page L&R-108 of the WWMA Agenda, stating that he didn’t want a standards development organization to decide for the states, and that it should be the Director’s discretion.

Kevin Schnepf, California Department of Food and Agriculture, Division of Measurement Standards agreed with the previous statements, adding “and/or” to line 16.

Aaron Yanker, Colorado Department of Agriculture, Weights and Measures echoed the previous statements, and stated he appreciated the direction for consistency.

The modified language containing suggestions by both Mr. Harrington and Mr. Schnepf is below.

An individual or agency ~~qualified by training or experience~~ may apply for registration to service weighing devices or measuring devices on an application form supplied by the Director, who may consider training and/or experience, and certificate(s) granted by a standards development organization recognized by the Director. Said form, duly signed and witnessed, shall include ~~certification guarantee~~ by the applicant that the individual or agency is fully qualified to install, service, repair, or recondition whatever devices for the service of which competence is being registered; has in possession or available for use, and will use, all necessary testing equipment and standards; and has full knowledge of all appropriate weights and measures laws, orders, rules, ~~and~~ regulations, and policies. An ~~applicant~~ individual or each individual of an agency ~~also~~ shall submit appropriate certificate(s), evidence, or references as to qualifications. The certificate(s) shall apply to the types of weighing devices and measuring devices inspected and tested by the individual or agency. Device types without available certificate(s) may be exempted. Application for registration shall be voluntary, but the Director is authorized to reject or limit any application. (Added 1966) (Amended 1984) (Amended 20XX)

The WWMA Laws and Regulations Committee recommends this item be Informational.

SWMA 2023 Annual Meeting: Based on comments received during open hearings, the SWMA recommends this as a Voting item with the following language for Section 4:

An individual or agency qualified by training or experience, and a certificate(s) granted by a recognized standards development organization approved by the Director; may apply for registration to service weighing devices or measuring devices on an application form supplied by the Director. Said form, duly signed and witnessed, shall include certification acknowledgment by the applicant that the individual or agency is fully qualified to install, service, repair, or recondition whatever devices for the service of which competence is being registered; has in possession or available for use, and will use, all necessary testing equipment and standards; and has full knowledge of all appropriate weights and measures laws, orders, rules, and regulations. An ~~applicant~~ individual or each individual of an agency ~~also~~ shall submit appropriate certificate(s), evidence, or and references as to qualifications. The certificate(s) shall apply to the types of weighing devices and measuring devices inspected and tested by the individual or agency. Device types without available certificate(s) may be exempted.

Application for registration shall be voluntary, but the Director is authorized to reject or limit any application. (Added 1966) (Amended 1984) (Amended 20XX)

NEWMA 2023 Interim Meeting: Lou Sakin, Holliston, MA – MA does not register service agents and never will.

Jim Cassidy, MA - Weights and Measures officials are already in place for these inspections and this would be a conflict of interest.

Jim Willis, NY – New York does not allow registered service companies.

Marc Parquette, VT - Vermont does not have this requirement either.

Ethan Bogran, Westchester, NY - Recommends that its fully developed it should be ‘Voting’.

The committee recommends this item to be a developing 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.

FLR – UNIFORM FUELS AND AUTOMOTIVE LUBRICANTS REGULATION

FLR-23.3 D Section 2.20. Hydrogen Fuel.

Source:

Quong and Associates

Purpose:

Add equivalent hydrogen quality standard, ISO 14687 to 2.20.

Item under Consideration:

Amend Handbook 130 Uniform Fuels and Automotive Lubricants Regulation as follows:

2.20. Hydrogen Fuel. – Shall meet the latest version of SAE J2719, “Hydrogen Fuel Quality for Fuel Cell Vehicles.” or ISO14687 “Hydrogen fuel quality — Product specification”.
(Added 2012) (Amended 20XX)

Previous Action:

2023: Developing Item

Original Justification:

As hydrogen fuel cell vehicles expand worldwide, the codes and standards that support them have also moved to an international stage. Currently, most of the hydrogen quality requirements for fuel cell vehicles have occurred under the International Organization for Standardization (ISO) 14687 “Hydrogen fuel quality — Product specification”. The latest revision of ISO 14687 occurred in 2019, and SAE 2719 was updated in 2020 to match. The attached document compares the latest hydrogen fuel quality specifications in ISO 14687 2019 and SAE J2719 2020. Having both requirements will allow the user of the station to use the most updated specification and ensure that fuel cell vehicles are protected from contaminated fuel.

Some may argue that Argument: The updates in ISO 14687 could be considered a relaxation of the hydrogen quality requirements. The submitter explained that the changes were made to provide flexibility for contaminants which could not damage the fuel cell vehicle, or combine contaminants with similar characteristics, such as inert gases or carbon monoxide/formaldehyde/formic acid.

Comments in Favor:

Regulatory:

- 2023 Annual: None

Industry:

- 2023 Annual: None

Advisory:

- 2023 Annual: None

Comments Against:

Regulatory:

- 2023 Interim: Dr. Matt Curran, Florida opposed the item going forward with two standards.
- 2023 Interim: Mr. Doug Musick, Kansas and Austin Sheppard, County of San Diego concurred that only one standard should be included.
- 2023 Interim: Ms. Vanesa Benchea, FALS Chair stated that two standards would be confusing. FALS recommended there should be direction to reach out to stakeholders, industry and make this informational.
- 2023 Interim: Mr. Kevin Schnepf, California: Concurs with FALS to keep it as informational.
- 2023 Interim: Mr. Austin Sheppard, County of San Diego stated he concurred with the previous comments regarding two standards and suggests picking the more stringent of the two standards instead of either.
- 2023 Interim: Mr. Ed Williams, Ventura County California stated he supports the comments made by Austin Sheppard San Diego County including the date of the version of the standard. He also supported the comments from Mr. Schnepf.

Industry:

- 2023 Annual: None

Advisory:

- 2023 Annual: None

Neutral Comments:

Regulatory:

- 2023 Annual: None

Industry:

- 2023 Annual: None

Advisory:

- 2023 Annual: None

Item Development:

NCWM 2023 Interim Meeting: The Committee, after hearing concern about the problems and confusion that will arise from citing two standards from Regulators and FALS Chair assigned Developing status to the item.

The Committee provides the following guidance to the Developer: Determine which standard is appropriate to resolve the issues derived from having two standards and update the Committee.

NCWM 2023 Annual Meeting: No comments were heard at the NCWM 2023 Annual meeting, and the Committee made no changes.

Regional Associations' Comments:

CWMA 2023 Interim Meeting: No comments were heard.

The committee recommends this item remain as developing until NIST and the developer are ready for it to proceed.

WWMA 2023 Annual Meeting: Matt Douglas, California Department of Food and Agriculture, Division of Measurement Standards stated that he supported Information or Developing status for this item, as ISO and SAE are on different update schedules, and mat not always align.

The WWMA L&R Committee recommends Withdrawal, as the submitter has not determined which one standard is appropriate, and there are issues having two standards, as stated in the NCWM 2023 Interim report.

SWMA 2023 Annual Meeting: The SWMA recommends that the submitter provide a modification with the selection of one standard by the NCWM Interim or the item be withdrawn.

NEWMA 2023 Interim Meeting: Lou Sakin, Holliston, MA – Note that no representative for this item is present to discuss the item.

Ethan Bogran, Westchester, NY – Believes it should be a 'Developing' item.

The committee recommends this as a developing 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.

NET – HANDBOOK 133: CHECKING THE NET CONTENT OF PACKAGED GOODS

NET-22.1 A HB133, Section 1.2.6. Deviations Caused by Moisture Loss or Gain and Section 2.3.8. Table 2-3 Moisture Allowances.

Source:

NCWM Cannabis Task Group

Purpose:

Establish an acceptable Net Weight allowance for *Cannabis*, which is related to the MOS Form 15 related to water activity and the Packaging and Labeling Form 15 Sections 2 and 10.

Item Under Consideration:

Amend Handbook 133, Checking the Net Contents of Packaged Goods, as follows:

1.2.6. Deviations Caused by Moisture Loss or Gain

Deviations from the net quantity of contents caused by the loss or gain of moisture from the package are permitted when they are caused by ordinary and customary exposure to conditions that normally occur in good distribution practice and that unavoidably result in change of weight or measure. According to regulations adopted by the U.S. Environmental Protection Agency, no moisture loss is recognized on pesticides. (see Code of Federal Regulations 40 CFR 156.10.)

1.2.6.1. Applying a Moisture Allowance

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 may be applied before or after the package errors are determined.

To apply an allowance 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. 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 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 (MAV) permitted for the package’s labeled quantity).

You may apply a moisture allowance 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” 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”) 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 or more information must be collected before deciding lot compliance or noncompliance.

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

6 Appropriate enforcement should be taken on packages found short weight and outside of the “moisture
7 allowance” or “gray area.”

8 (Amended 2002)

...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	
<u>Cannabis</u>	<u>3 %</u>	<u>Cannabis means plant material only, and not products containing Cannabis, whether containing more than 0.3% Total Delta-9 THC (also known as Cannabis, Marijuana or Marihuana) or containing 0.3% or less Total Delta-9 THC (also known as Hemp).</u>
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 if there is no free-flowing liquid or absorbent material in contact with the product and the package is cleaned of clinging material. Luncheon meats are any cooked sausage product, loaves, jellied products, cured products, and any sliced sandwich-style meat. This does not include whole hams, briskets, roasts, turkeys, or chickens requiring further preparation to be made into ready-to-eat sliced product. When there is no free-flowing liquid inside the package and there are no absorbent materials in contact with the product, Wet Tare and Used Dried Tare are equivalent.
¹ Wet tare procedures must not be used to verify the labeled net weight of packages of meat and poultry packed at an official United States Department of Agriculture (USDA) facility and bearing a USDA seal of inspection. The Food Safety and Inspection Service (FSIS) adopted specific sections of the 2005 4th edition of NIST Handbook 133 by reference in 2008 but not the “Wet Tare” method for determining net weight compliance. FSIS considers the free-flowing liquids in packages of meat and poultry products, including single-ingredient, raw poultry products, to be integral components of these products (see Federal Register, September 9, 2008 [Volume 73, Number 175] [Final Rule – pages 52189-52193]).		

Previous Action:

2022: Assigned - Cannabis Task Group

2023: Assigned - Cannabis Task Group

Original Justification:

Since *Cannabis* and *Cannabis*-containing products were first legalized by various states, the industry has undergone an unprecedented expansion. Even though these products haven't received Federal approval at this time, more and more states have supported *Cannabis* and *Cannabis*-containing products for medicinal or adult use under their own laws. This has resulted in boutique markets developing across the country with restrictive state boundaries for lack of clarity and uniformity in commercialization of these products.

Cannabis and *Cannabis*-containing products are unique in many aspects; they have a niche as medicine, have resulted in the development of adult use markets, and have an incredible array of different manufacturing and industrial applications. Some of these products contain controlled substances which presents a special concern for the safety and welfare of consumers if misused or mishandled. Further, they are subject to strict regulations by multiple government agencies. *Cannabis* and *Cannabis*-containing products and applications range from non-food to food products for human and animal consumption through inhalation, ingestion, and/or topical or dermal application. They can be used as ingredients in other commodities, changing in most cases the product identity to *Cannabis* products. Some *Cannabis* is very susceptible to environmental conditions easily losing or gaining moisture with consequences impacting net quantity, degradation of active cannabinoids, and/or microbial proliferation depending on the situation. These are just some of the reasons there are many concerns and uncertainty surrounding the moisture allowance of *Cannabis*.

In the retail *Cannabis* trade, insufficient attention and guidance is given to moisture migration in or out of some *Cannabis* packaging and as a result, the contents of some *Cannabis* flower packaging have been found to be underweight, resulting in the patient/consumer paying for weight that they are not receiving. For instance, underweight complaints are the #1 consumer complaint in Oregon. See attached table for data from multiple stores of four brands and the incidence of underweight contents.

Preview: If you were shopping any one of 3 stores of a popular brand you'd have a 71% chance of buying a supposedly 1.75g package that is 21.6% underweight, meaning you have a 71% chance of being ripped off by \$5 (assuming a \$10/g price). The lowest incidence of underweight? 54%. The lowest percent underweight? 2.75%

For the fairness and safety of *Cannabis* consumers, a 3% +/- weight variance based on enforcement of acceptable moisture range needs to be established. A 3% allowance aligns with other known commodities and with California regulations that outline +/- 3%.

Why 3%? Consistent with other items in NIST handbook, aligns with California. If the boundaries are too wide, it exposes the program to diversion.

Is underweight really an issue? I filed Public Records requests with every state that allows *Cannabis* flower commerce. Each of them told me they keep no official records on underweight complaints. However, Oregon went on record telling me underweight is one of their largest complaints (attached). As for one other state, see attached data from Colorado that recorded 69 separate container purchases from 18 separate stores within 4 brands.

The submitter asked that this be a Voting Item in 2022.

Comments in Favor:

Regulatory:

- 2023 Interim: Mr. Craig Van Buren, Michigan, expressed support to move forward as a voting item, but noted that they are still missing the data and have had issues getting the testing done. He recommended that if the data doesn't support the proposal that it be withdrawn.

Industry:

- 2023 Annual: None

Advisory:

- 2023 Annual: None

Comments Against:

Regulatory:

- 2023 Annual: None

Industry:

- 2023 Annual: None

Advisory:

- 2023 Annual: None

Neutral Comments:

Regulatory:

- 2023 Interim: Mr. Vince Wolpert, Arizona stated that part of the study simulated environment. He pointed out that there are a wide range of packaging options glass, wood, paper, plastic, foil, and that best practices have not been developed yet for the cannabis industry.

Industry:

- 2023 Annual: None

Advisory:

- 2023 Interim: Mr. David Sefcik, NIST OWM stated that Cannabis is a schedule 1 controlled substance. OWM recognizes the importance of this item and this time recommended that the item remain assigned until a there is data to support it. He expressed concern with the positive moisture gain allowance stating this allows a moisture gain up to 3% and the HB 133 doesn't allow for moisture gain. The proposal should only address a negative error, not a positive error.

- 2023 Annual: Mr. Charlie Rutherford, representing the Cannabis Task Group as Co-Chair, updated the Committee that the state of Michigan is performing tests and currently compiling data on moisture loss allowances.

Item Development:

NCWM 2022 Interim Meeting: The Committee designated this item as Assigned at the 2022 NCWM Interim Meeting and removed it from Block 3 (B3). The Committee referred it back to the NCWM Cannabis Task Group to conduct a study relative to moisture loss allowance for Cannabis.

The Committee referred it back to the NCWM Cannabis Task Group to establish data supporting the moisture loss allowance the Task Group recommended. The Committee heard concerns that should the current moisture loss allowance be accepted without a study, the NCWM would be setting a precedence for future moisture loss allowance requests. The Committee considered comments urging the Committee to move forward with the +/- 3 % moisture loss allowance but believes it would be imprudent to accept a moisture loss allowance without supporting data.

The Committee is recommending the NCWM Cannabis Task Group to follow NIST Handbook 130, NCWM, Interpretations and Guidelines section 2.5.6 Guidelines for NCWM Resolution of Requests for Recognition of Moisture Loss in Other Packaged Products to establish the moisture allowances (loss and gain).

A request was made to the Cannabis Task Group for information and data supporting their proposed moisture loss allowance, but as of the time of this writing it was not received.

The Committee assigned Voting status to items B3: PAL-22.1, B3: PAL 22.2 and B3: MOS-22-2 because they heard support for these items and believe they are fully developed.

NCWM 2022 Annual Meeting: This item was originally included in Item Block 3 (B3) but was removed by the Committee at the 2022 Annual meeting. Its status remains "Assigned". The other items were "Voting" items.

The Committee heard from the Cannabis Task Group that work on studying moisture loss has begun. Cannabis Task Group Co-Chair Charlie Rutherford informed the Committee that the Task Group is working with the State of Michigan, a packaging company, and a cannabis provider to study moisture loss.

The Committee heard from Dave Sefcik, NIST, OWM during the open hearings. Mr. Sefcik shared the following with the Committee: "In contrast to hemp, marijuana remains a Schedule I substance under the Controlled Substances Act. NIST does not have a regulatory or policy role related to the production, sale, distribution, or use of cannabis (including hemp and marijuana). NIST participates in the National Conference of Weights and Measures as part of NIST's statutory mission to promote uniformity in state laws, regulations, and testing procedures."

The Committee considered the written NIST, OWM analysis published on the NCWM website prior to the NCWM 2022 Annual Meeting.

NCWM 2023 Interim Meeting: The Committee designated this item as Assigned and kept it assigned to the Cannabis Task Group. The Committee encourages the conduct and completion of a study to determine the moisture allowance and the information to be provided to the Committee. This information is necessary before the Committee can consider the item as fully developed and move it forward as a Voting item.

NCWM 2023 Annual Meeting: The Committee received an update from the Cannabis Task Group and based on it, made no changes.

Regional Associations' Comments:

CWMA 2023 Interim Meeting: Greg VanderPlaats, Minnesota commented he believes the items should remain as an Assigned item until we have additional data.

The committee agrees that the item should remain assigned to the task group.

WWMA 2023 Annual Meeting: Vince Wolpert, Cannabis Task Group Co-Chair requested that this item remain Assigned. It was also stated that the analysis of moisture loss has been completed, and is being compiled by Craig VanBuren, Michigan. The Cannabis Task Group will be making recommendations regarding moisture loss once that data has been compiled and analyzed. This may include water activity information as well. Matt Douglas, California Department of Food and Agriculture, Division of Measurement Standards supported an Assigned status, and is looking forward to the report.

The WWMA L&R Committee recommends this item remain Assigned to the Cannabis Task Group.

SWMA 2023 Annual Meeting: The SWMA recommends that this item remained assigned and awaits the upcoming data.

NEWMA 2023 Interim Meeting: Lou Sakin, Holliston MA, representing the Cannabis Task Group – This item is not ready to move forward. Awaiting data from testing results Craig VanBuren, MI. The committee recommends this as an assigned 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.

NET-24.1 Section 3.11. Ice Cream Novelties.

Source:

County of Los Angeles Department of Agriculture Commissioner/Weights and Measures

Purpose:

Add to the procedure and provide technical guidance on the preparation and maintenance of ice water at the required temperature to test ice cream novelties such as ice cream bars, ice cream sandwiches, or cones.

Item Under Consideration:

Amend Handbook 133, Checking the Net Contents of Packaged Goods, as follows:

3.11. ICE CREAM NOVELTIES

Note: The following procedure can be used to test packaged products that are solid or semisolid and that will not dissolve in, mix with, absorb, or be absorbed by the fluid into which the product will be immersed. ~~For example, ice cream and frozen novelties~~ labeled by volume can be tested using ~~ice~~ chilled water or kerosene as the immersion fluid.

Exception: Pelletized ice cream is beads of ice cream which are quick frozen with liquid nitrogen. The beads are relatively small but can vary in shape and size. On April 17, 2009, the FDA issued a letter stating that this product is considered semisolid food, in accordance with 21 CFR 101.105(a). The FDA also addresses that the appropriate net quantity of content declaration for pelletized ice cream products be in terms of net weight.

(Added 2010)

The following volume displacement procedure uses a displacement vessel specifically designed for ice cream novelties such as ice cream bars, ice cream sandwiches, or cones. The procedure determines the volume of the novelty by measuring the amount of water displaced when the novelty is submerged in the vessel. Two displacements per sample are required to subtract the volume of sticks or cups.

1 The procedure first determines if the densities of the novelties are the same from package to package
2 (in the same lot) so that a gravimetric test can be used to verify the labeled volume. If a gravimetric
3 procedure is used, compute an average weight for the declared volume from the first two packages and
4 weigh the remainder of the sample. If the gravimetric procedure cannot be used, use the volume
5 displacement procedure for all of the packages in the sample.

6 3.11.1. Test Equipment

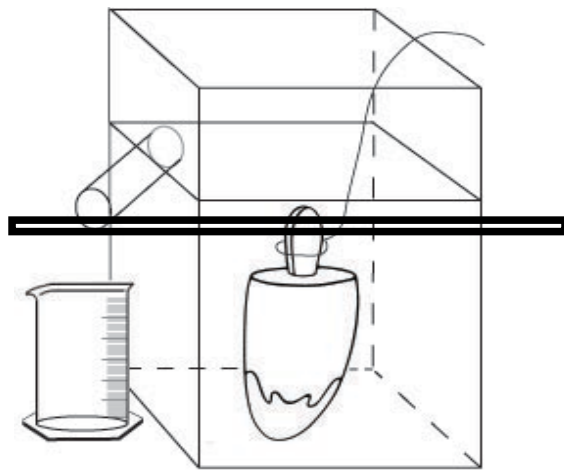
- 7 • A scale that meets the requirements in Section 2.2. “Measurement Standards and Test
8 Equipment”
- 9 • Volumetric measures
- 10 • Displacement vessel with dimensions appropriate for the size of novelties being tested (see
11 Figure 3-7(a), “Example of a Displacement Vessel”). It should include an interior baffle that
12 reduces wave action when the novelty is inserted and a downward angled overflow spout to
13 reduce dripping. Other designs may be used.
- 14
- 15



16 **Figure 3-7(a). Example of a Displacement Vessel.**

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- Insulation shield

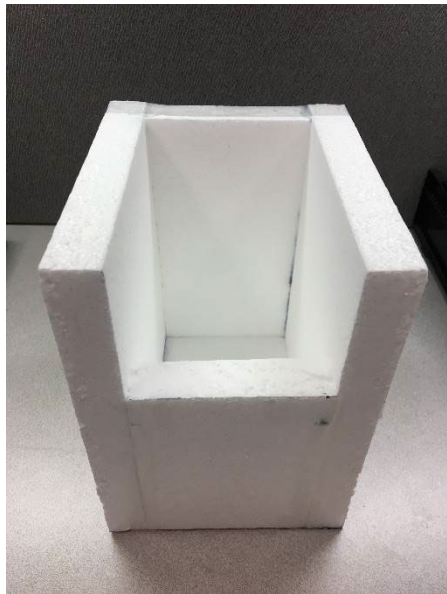
- Minimum one inch thick Styrofoam board

- Styrofoam glue

Use a minimum of one inch thick Styrofoam board to assemble the insulation shield. The insulation shield should be assembled with dimensions that will cover as much surface area of the displacement vessel and with as few gaps as possible (see Figure 3-7(b)(c)(d), “Example of an insulation shield with displacement vessel”).

1 **The purpose of this equipment is to reduce thermal transfer from ambient environment to the displacement**
2 **vessel in order to maintain the immersion fluid at 1 °C (33 °F) or below as consistently as possible during testing.**

3 **Figure 3-7(b)(c)(d). Example of an Insulation Shield with Acrylic Displacement Vessel.**



(b)



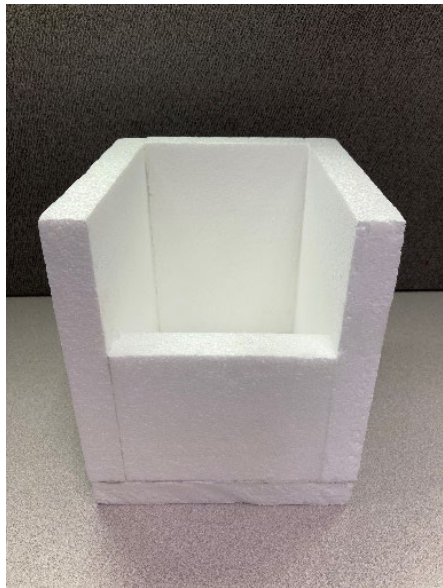
(c)



(d)

4 **Figure 3-7(b)(c)(d). Example of an Insulation Shield with Acrylic Displacement Vessel.**

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(e)



(f)



(g)

Figure 3-7(e)(f)(g). Example of an Insulation Shield with Metal Displacement Vessel

- Thin wire, clamp, or tongs
- Freezer or ice chest **containing** ~~and~~ dry ice
- Single-edged razor or sharp knife (for sandwiches only)
- **Prepared, chilled** water ~~kerosene~~ maintained at 1 °C (33 °F) or below
- **Water, ice cubes, dry ice, pitcher with insulation blanket**
- **Cryogenic gloves (for handling dry ice)**
- **Plastic Pitcher with insulation blanket**
- **Strainer**
- Indelible marker (for ice pops only)
- Level, at least 152 mm (6 in) in length
- Partial immersion thermometer or equivalent with 1 °C (2 °F) graduations and a – 35 °C to + 50 °C (– 30 °F to + 120 °F) accurate to ± 1 °C (± 2 °F)
- A tabletop, laboratory-type jack of sufficient size to hold the displacement vessel
- Stopwatch

3.11.2. Test Procedure

1.	Follow the procedures in Section 2.3.1. “Define the Inspection Lot.” Use a “Category A” sampling plan in the inspection; and select a random sample.
2.	<u>Place the displacement vessel and insulation shield in a freezer or an ice chest filled with dry ice for at least 30 minutes prior to testing. It is advisable to pre-chill water for use as immersion fluid in a sufficient volume to fill the displacement vessel and to replenish as needed throughout the testing procedures by placing a container of water in a refrigerator or ice chest during the same period.</u> Maintain the <u>ice cream or frozen novelty</u> samples at the reference temperature for frozen products that is specified in Table 3-1. “Reference Temperatures for Liquids.” Place the samples in the freezer or ice chest until they are ready to be tested, and then remove packages from the freezer one at a time.
3.	According to the type of novelty, prepare the sample products as follows:
➤	*Ice-pop. Mark on the stick(s) with the indelible marker the point to which the ice-pop will be submerged in the <u>prepared, chilled</u> water. (After the ice-pop contents have been submerged, remove the novelty to determine the volume of the stick.)
➤	*Cone. Make a small hole in the cone below the ice cream portion to allow air to escape.
➤	Sandwich. Determine whether the declared volume is (a) the total volume of the novelty (that is, including the cookie portion) or (b) the volume of the ice-cream-like portion only. If the declared volume is the volume of only the ice-cream-like portion, shave off the cookie with a razor or knife, leaving some remnants of cookie to ensure that no ice cream is accidentally shaved off. Work quickly and return the novelty to the freezer before the sandwich softens.
➤	Cup. Remove the cap from the cup.

4. Prepare immersion fluid to a temperature of 1 °C (33 °F) or below by adding dry ice and ice cubes to water in a plastic pitcher.

For best results, wrap the pitcher with an insulation blanket to prevent heat transfer from the ambient environment. Monitor the water temperature throughout this procedure by placing the thermometer in the center position of the pitcher.

Note: Be cautious while handling dry ice due to its very low temperature (-109 °F); handle it with cryogenic gloves to prevent frostbite or freezer burns to skin.

Note: Dry ice (-109 °F) is the key ingredient for the chilled water immersion fluid preparation because of its very low temperature. However, while the dry ice lowers the water mixture temperature, the water surface that is in contact with the ambient air in the testing environment is also constantly gaining heat due to heat transfer. To resolve this problem, add ice cubes to the water; the ice cubes will float and form an insulation barrier, thereby, allowing water temperature to be maintained at the required temperature. The ratio to make the prepared, chilled water (can reach as low as 31.6 °F) are as follows:

Water : Dry ice : Ice cubes = 6 : 1 : 2

Note: Monitoring of the temperature of the chilled water immersion fluid should be conducted throughout the testing. At any time that the chilled water temperature exceeds 1 °C (33 °F), a new batch of chilled water at the required temperature will need to be prepared to validate the testing procedure.

5. When the displacement vessel and the insulation shield are both chilled and ready to be used, assemble them together (see Figure 3-7(b)(c)(d)).

6. 4. Fill the displacement vessel with ~~ice-prepared~~, chilled water until it overflows the spout. Use a strainer to prevent ice cubes or dry ice chunks from flowing into the displacement vessel. Allow it to sit until dripping stops. Raise the displacement vessel with a tabletop laboratory-type jack as necessary and place the graduate of appropriate capacity beneath the spout.

7.5. Remove a package from the freezer, determine its gross weight, and record it.

8.6. Submerge the novelty as suggested until it is below the surface level of the water.

➤ **Ice-pop.** Use a clamp, tongs, or your fingers to hold the stick(s) and submerge the ice-pop to the level marked in Step 3 of the Test Procedure.

➤ **Cone.** Shape the wire into a loop, and use it to push the cone, headfirst (ice cream portion first) into the **prepared, chilled** water. Do not completely submerge the cone immediately: let water fill the cone through the hole made in Step 3 of the Test Procedure before completely submerging the novelty.

➤ **Sandwich or cup.** Skewer the novelty with the thin wire or form a loop on the end of the wire to push the sandwich or ice cream portion or cup completely below the liquid level.

9.7. Record the total water volume in the graduate.

- For a cone or sandwich, record the water volume as the net volume and go to Step 9.
- For ice-pops or cups, record the water volume in the graduate as the gross volume and go to Step 8.

10.8. Refill the displacement vessel with **prepared, chilled water to overflowing and reposition the empty graduate under the spout. After the cup and novelty contents have been submerged, remove the novelty from the cup to determine the volume of the cup.**

<p>➤ Ice-pop. Melt the ice-pop off the stick or sticks. Submerge the stick or sticks to the line marked in Step 3. Record the volume of tare material (i.e., stick) by measuring the water displaced into the graduate. The net volume for the ice-pop is the gross volume recorded in Step 7 minus the volume of the tare materials in this step. Record this volume as the “volume of novelty.” To determine the error in the package, subtract the labeled quantity from the volume of novelty.</p>
<p>➤ Cup. Remove the novelty from the cup. Rinse the cup, and then submerge it in the displacement vessel. Small pinholes in the base of the cup can be made to make submersion easier. Record the volume of water displaced into the graduate by the cup as the volume of tare material. The net volume for the novelty is the gross volume determined in Step 7 minus the volume of the tare materials determined in this step. Record this as the net volume of the novelty. To determine the error in the package, subtract the labeled quantity from the volume of novelty.</p>
<p>11.9. Clean and air-dry the tare materials (sticks, wrappers, cup, lid, etc.). Weigh and record the weight of these materials for the package.</p>
<p>12.10. Subtract the tare weight from the gross weight to obtain the net weight and record this value.</p>
<p>13.11. Compute the weight of the labeled volume for the package using the following formula and then record the weight:</p> $\text{Product Density} = (\text{product net weight in Step 10}) \div (\text{the total water volume in Step 7} - \text{volume of tare material in Step 8})$ $\text{Weight of labeled volume} = (\text{labeled volume}) \times (\text{Product Density})$
<p>14.12. Repeat Steps 3 through 11 for a second package.</p>
<p>15.13. If the weight of the labeled volumes in Step 11 for the two packages differs from each other by more than one division on the scale, the gravimetric test procedure cannot be used to test the sample for compliance. If this is the case, use Steps 3 through 8 for each of the remaining packages in the sample to determine their net volumes and package errors. Then go to evaluation of results. If the weights of the labeled volumes agree within one division, continue to Step 14 to test the rest of the sample using the gravimetric test procedure.*</p>
<p>16.14. Use Section 2.3.5.1. “Determination of Tare Sample and Average Tare Weight” to determine the Average Used Dry tare Weight of the sample.</p>
<p>17.15. Find the Average Product Density by adding the densities of the product from the two packages and dividing the sum by two.</p>
<p>18.16. Using the weight of labeled volume determined in Step 11, calculate the Average Product Weight by multiplying the weight of the labeled volume by the average product density.</p> $\text{*Average Product Weight} = \text{Labeled Volume} \times \text{Average Product Density}$
<p>19.17. Calculate the “nominal gross weight” using the formula:</p> $\text{Nominal Gross Weight} = \text{Average Product Weight} + \text{Average Used Dry Tare Weight}$
<p>20.18. Weigh the remaining packages in the sample.</p>
<p>21.19. Subtract the nominal gross weight from the gross weight of each package to obtain package errors in terms of weight.</p>
<p>Note: Compare the sample packages to the nominal gross weight.</p>
<p>22.20. Determine the average package error by totaling all package errors and dividing by the number of packages in the sample.</p>
<p>To convert the average error or package error from weight to volume, use the following formula:</p>

$$\text{Package Error in Volume} = (\text{Package Error in Weight}) \div (\text{Average Product Density})$$

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3.11.3. Evaluation of Results

Follow the procedures in Section 2.3.7. “Evaluate for Compliance” to determine lot conformance.

Previous Action:

2024: New Proposal

Original Justification:

The existing Handbook 133 procedure does not include guidance on the preparation of chilled water as an immersion fluid at the required temperature [1 °C (33 °F) or below]. As such, it can be difficult to maintain the immersion fluid for a reliable duration at the required temperature [1 °C (33 °F) or below] after the chilled water is poured into the displacement vessel. Water temperature exceeding 1 °C (33 °F) will result in the potential melting or softening of the ice cream or frozen novelty, thus resulting in inaccurate testing data and consequently invalidate or invite challenges to the inspection findings.

Testing Data

Data Analysis and Summary Justification

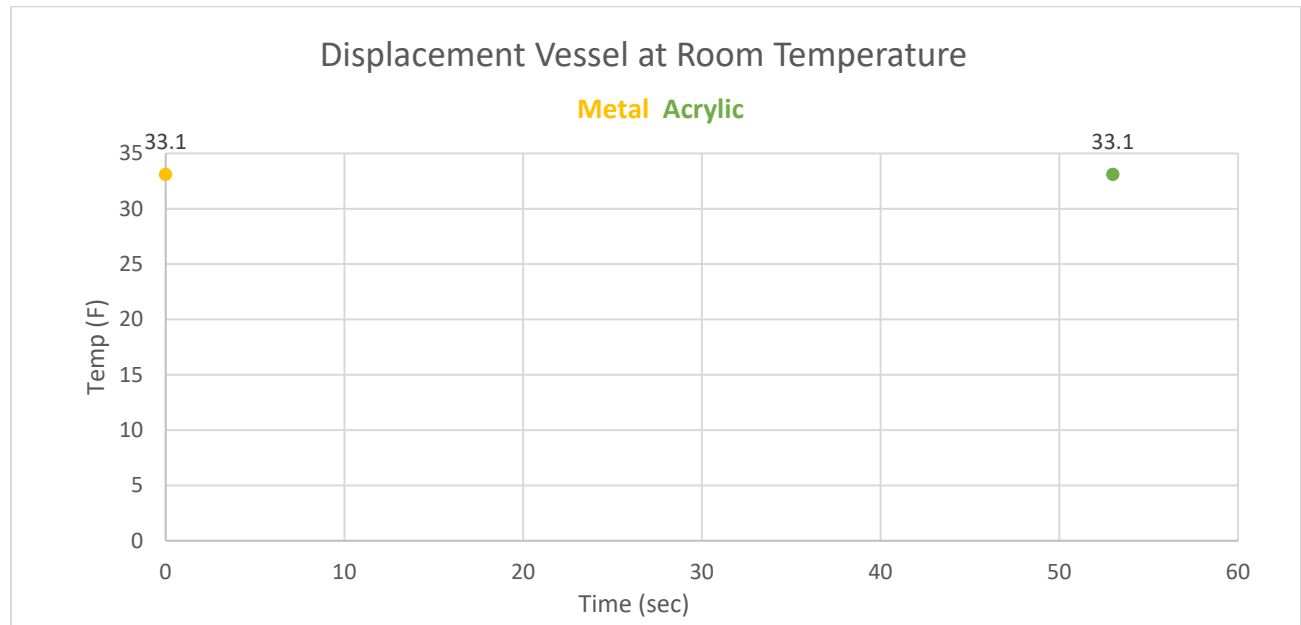
The following data summarizes the test of various materials for displacement vessels for this procedure. Materials considered were acrylic and metal in a variety of settings (ambient, with insulation, with insulation and prior chilling in freezer). These materials were chosen to reflect the variety used in typical, current displacement vessel fabrication.

The acrylic displacement vessel, combined with the insulation shield (with prior chilling), had the most favorable and reliable results for temperature stability. With the insulation and prior chilling, temperature stability in the acrylic displacement vessel significantly increased from 53 seconds of maintaining the temperature below 33.1 °F to 93 minutes and 53 seconds.

I. Displacement Vessel at Room Temperature (Without Insulation Shield)

Data below recorded length of time that water temperature stayed below 33.1°F.

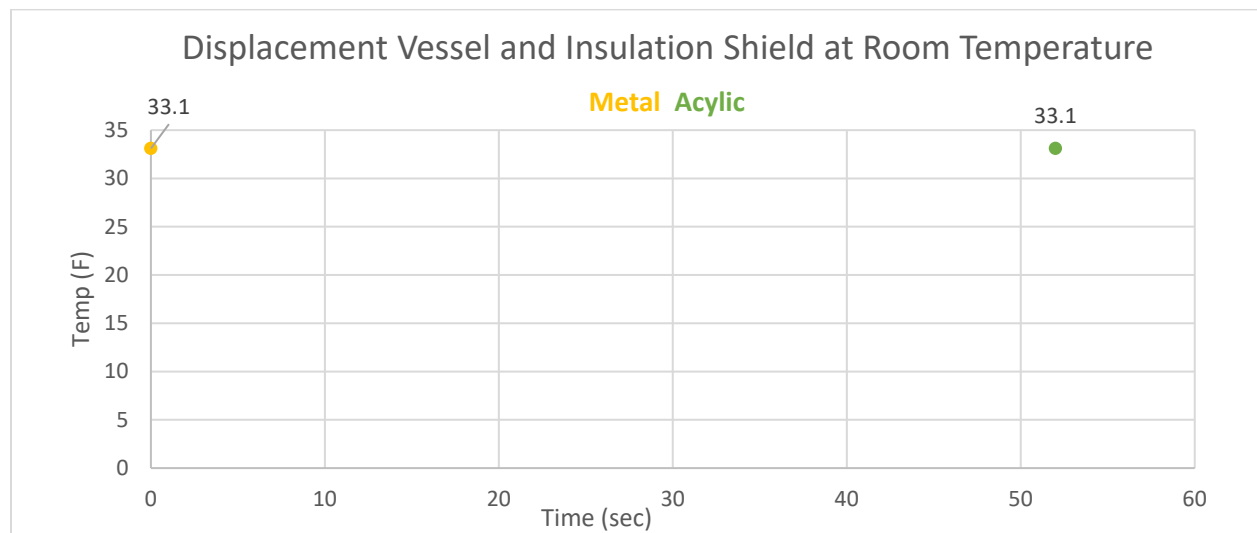
Tester Material	Time (min: sec)
Metal	00:00
Acrylic	00:53



II. Displacement Vessel at Room Temperature (With Insulation Shield)

Data below recorded length of time that the water temperature stayed below 33.1°F.

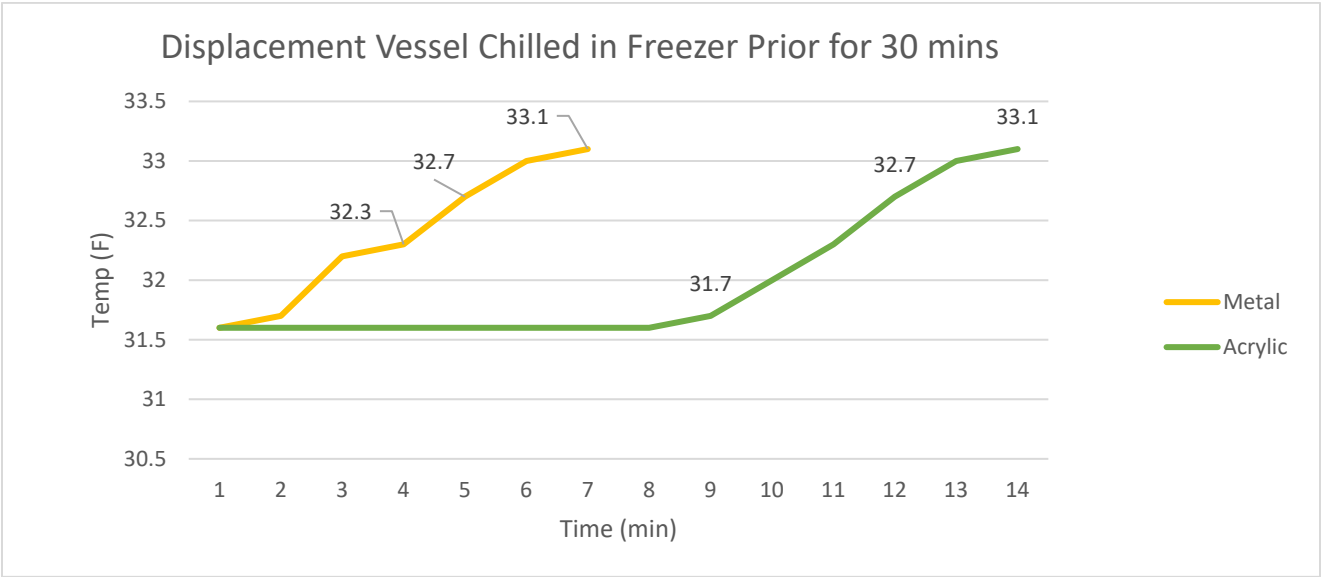
Tester Material	Time (min: sec)
Metal	00:00
Acrylic	00:52



III. Displacement Vessel Chilled in Freezer for 30 minutes Prior to Test (Without Insulation Shield)

Prior to the testing, the displacement vessel was chilled in freezer prior to test for half an hour (30 mins).
Data below recorded length of time that the water temperature stayed below 33.1°F.

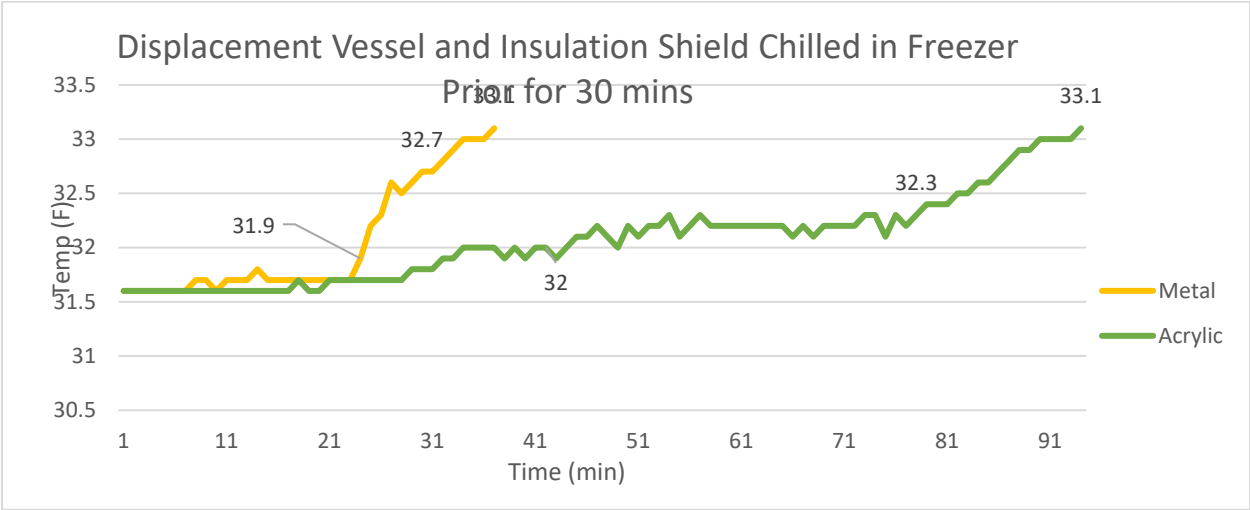
Tester Material	Time (min: sec)
Metal	06:30
Acrylic	13:22



IV. Displacement Vessel and Insulation Shield Chilled in Freezer for 30 minutes Prior to Test

Prior to the testing, displacement vessel and insulation shield chilled in freezer for half an hour (30 mins). Data below recorded length of time that the water temperature stayed below 33.1 °F.

Tester Material	Time (min: sec)
Metal	36:16
Acrylic	93:50



The submitter asked that this be an Informational Item in 2024.

Comments in Favor:

Regulatory:

-

Industry:

-

Advisory:

-

Comments Against:

Regulatory:

-

Industry:

-

Advisory:

-

Neutral Comments:

Regulatory:

-

Industry:

-

Advisory:

-

Item Development:

New Proposal

Regional Associations' Comments:

New Proposal

CWMA 2023 Interim Meeting: No comments were heard.

The committee recommends this item be informational for more comments to come in.

WWMA 2023 Annual Meeting: A presentation was given by the submitter of this item during open hearings, and is available on the WWMA website. The submitter recognized editorial changes submitted by Matt Douglas, CDFA-DMS. The submitter stated that this item is fully developed and would like a Voting status.

Austin Shepherd, County of San Diego, California voiced his support for the proposal as voting.

Matt Douglas, California Department of Food and Agriculture, Division of Measurement Standards echoed the comments of Mr. Shepherd, voicing support for the item with the adoption of his editorial changes.

Kurt Floren, County of Los Angeles, California stood to thank Annie Tsou and Lina Ng of LA County for their hard work on this submission. Mr. Floren stated that it is absolutely critical to maintain the temperature of the water during this test procedure. Mr. Floren also stated that this item also cleans up code, and fully supports this as a voting item.

Jose Arriaga, County of Orange, California also voiced support for this item with the editorial changes.

The WWMA L&R Committee recommends this item as a Voting item.

The updated proposal is shown below.

3.11. ICE CREAM NOVELTIES

Note: The following procedure can be used to test packaged products that are solid or semisolid and that will not dissolve in, mix with, absorb, or be absorbed by the fluid into which the product will be immersed. ~~For example, ice cream and frozen novelties~~ labeled by volume can be tested using ~~icechilled~~ water ~~or kerosene~~ as the immersion fluid.

Exception: Pelletized ice cream is beads of ice cream which are quick frozen with liquid nitrogen. The beads are relatively small but can vary in shape and size. On April 17, 2009, the FDA issued a letter stating that this product is considered semisolid food, in accordance with 21 CFR 101.105(a). The FDA also addresses that the appropriate net quantity of content declaration for pelletized ice cream products be in terms of net weight.

(Added 2010)

The following volume displacement procedure uses a displacement vessel specifically designed for ice cream novelties such as ice cream bars, ice cream sandwiches, or cones. The procedure determines the volume of the novelty by measuring the amount of water displaced when the novelty is submerged in the vessel. Two displacements per sample are required to subtract the volume of sticks or cups.

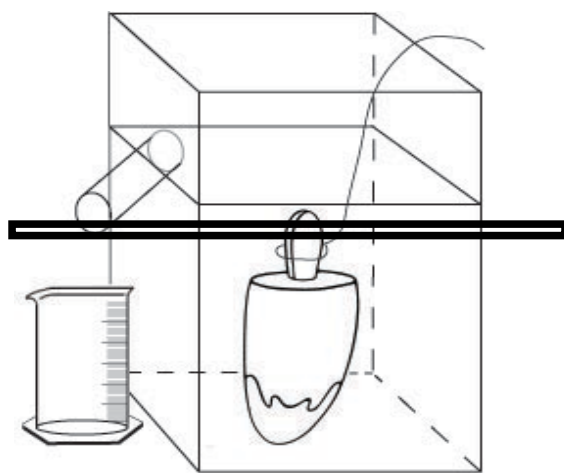
The procedure first determines if the densities of the novelties are the same from package to package (in the same lot) so that a gravimetric test can be used to verify the labeled volume. If a gravimetric procedure is used, compute an average weight for the declared volume from the first two packages and weigh the remainder of the sample. If the gravimetric procedure cannot be used, use the volume displacement procedure for all of the packages in the sample.

3.11.1. Test Equipment

- A scale that meets the requirements in Section 2.2. "Measurement Standards and Test Equipment"
- Volumetric measures
- Displacement vessel with dimensions appropriate for the size of novelties being tested (see Figure 3-7(a), "Example of a Displacement Vessel"). It should include an interior baffle that reduces wave action when the novelty is inserted and a downward angled overflow spout to reduce dripping. Other designs may be used.



Figure 3-7(a). Example of a Displacement Vessel.



- **Insulation shield**

- **Minimum one inch thick Styrofoam board**

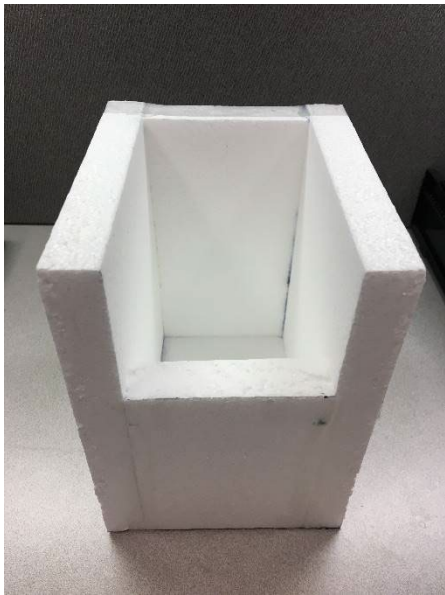
- **Styrofoam glue**

Use a minimum of one inch thick Styrofoam board to assemble the insulation shield. The insulation shield should be assembled with dimensions that will cover as much surface area of the displacement vessel and with as few gaps as possible (see Figure 3-7(b)(c)(d), “Example of an insulation shield with displacement vessel”).

The purpose of this equipment is to reduce thermal transfer from ambient environment to the displacement vessel in order to maintain the immersion fluid at 1 °C (33 °F) or below as consistently as possible during testing.

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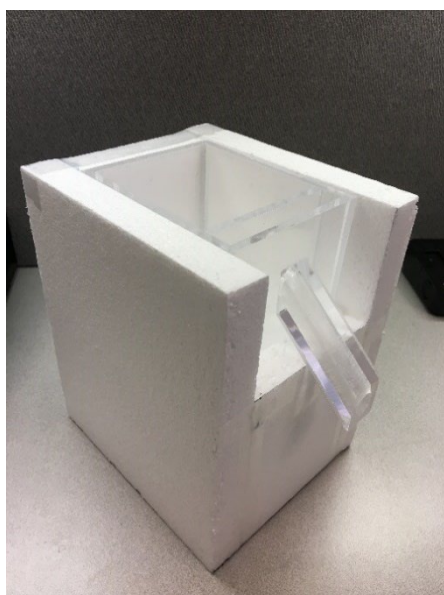
Figure 3-7(b)(c)(d). Example of an Insulation Shield with Acrylic Displacement Vessel.



(b)

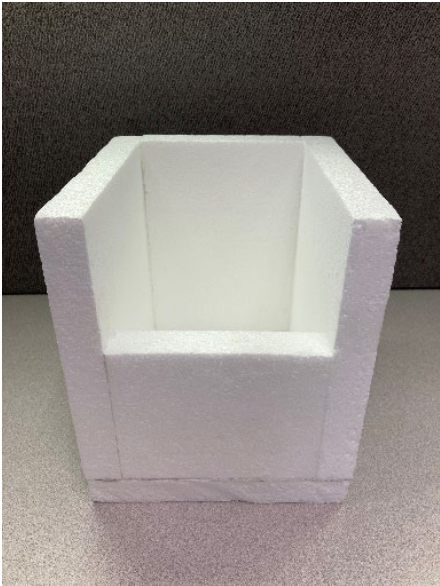


(c)



(d)

Figure 3-7(b)(c)(d). Example of an Insulation Shield with Acrylic Displacement Vessel.



(e)



(f)



(g)

Figure 3-7(e)(f)(g). Example of an Insulation Shield with Metal Displacement Vessel

- Thin wire, clamp, or tongs
- Freezer or ice chest **containing and** dry ice
- Single-edged razor or sharp knife (for sandwiches only)
- **Prepared, chilled** water ~~kerosene~~ maintained at 1 °C (33 °F) or below
- **Water, ice cubes, dry ice, pitcher with insulation blanket**
- **Cryogenic gloves (for handling dry ice)**
- **Plastic Pitcher with insulation blanket**
- **Strainer**
- Indelible marker (for ice pops only)
- Level, at least 152 mm (6 in) in length
- Partial immersion thermometer or equivalent with 1 °C (2 °F) graduations and a – 35 °C to + 50 °C (– 30 °F to + 120 °F) accurate to ± 1 °C (± 2 °F)
- A tabletop, laboratory-type jack of sufficient size to hold the displacement vessel
- Stopwatch

3.11.2. Test Procedure

2.	Follow the procedures in Section 2.3.1. “Define the Inspection Lot.” Use a “Category A” sampling plan in the inspection; and select a random sample.
2.	<u>Place the displacement vessel and insulation shield in a freezer or an ice chest filled with dry ice for at least 30 minutes prior to testing. It is advisable to pre-chill water for use as immersion fluid in a sufficient volume to fill the displacement vessel and to replenish as needed throughout the testing procedures by placing a container of water in a refrigerator or ice chest during the same period.</u> Maintain the <u>ice cream or frozen novelty</u> samples at the reference temperature for frozen products that is specified in Table 3-1. “Reference Temperatures for Liquids.” Place the samples in the freezer or ice chest until they are ready to be tested, and then remove packages from the freezer one at a time.
3.	According to the type of novelty, prepare the sample products as follows:
➤	<u>*Ice-pop.</u> Mark on the stick(s) with the indelible marker the point to which the ice-pop will be submerged in the <u>prepared, chilled</u> water. (After the ice-pop contents have been submerged, remove the novelty to determine the volume of the stick.)
➤	<u>*Cone.</u> Make a small hole in the cone below the ice cream portion to allow air to escape.
➤	<u>Sandwich.</u> Determine whether the declared volume is (a) the total volume of the novelty (that is, including the cookie portion) or (b) the volume of the ice-cream-like portion only. If the declared volume is the volume of only the ice-cream-like portion, shave off the cookie with a razor or knife, leaving some remnants of cookie to ensure that no ice cream is accidentally shaved off. Work quickly and return the novelty to the freezer before the sandwich softens.
➤	<u>Cup.</u> Remove the cap from the cup.
4.	<u>Prepare immersion fluid to a temperature of 1 °C (33 °F) or below by adding dry ice and ice cubes to water in a plastic pitcher.</u>
	<u>For best results, wrap the pitcher with an insulation blanket to prevent heat transfer from the ambient environment. Monitor the water temperature throughout this procedure by placing the thermometer in the center position of the pitcher.</u>
	<u>Note: Be cautious while handling dry ice due to its very low temperature (-109 °F); handle it with cryogenic gloves to prevent frostbite or freezer burns to skin.</u>
	<u>Note: Dry ice (-109 °F) is the key ingredient for the chilled water immersion fluid preparation because of its very low temperature. However, while the dry ice lowers the water mixture temperature, the water</u>

surface that is in contact with the ambient air in the testing environment is also constantly gaining heat due to heat transfer. To resolve this problem, add ice cubes to the water; the ice cubes will float and form an insulation barrier, thereby, allowing water temperature to be maintained at the required temperature. The ratio to make the prepared, chilled water (can reach as low as 31.6 °F) are as follows:

Water : Dry ice : Ice cubes = 6 : 1 : 2

Note: Monitoring of the temperature of the chilled water immersion fluid should be conducted throughout the testing. At any time that the chilled water temperature exceeds 1 °C (33 °F), a new batch of chilled water at the required temperature will need to be prepared to validate the testing procedure.

5. When the displacement vessel and the insulation shield are both chilled and ready to be used, assemble them together (see Figure 3-7(b)(c)(d)).

6. 4. Fill the displacement vessel with ~~ice-prepared, chilled~~ water until it overflows the spout. Use a strainer to prevent ice cubes or dry ice chunks from flowing into the displacement vessel. Allow it to sit until dripping stops. Raise the displacement vessel with a tabletop laboratory-type jack as necessary and place the graduate of appropriate capacity beneath the spout.

7.5. Remove a package from the freezer, determine its gross weight, and record it.

8.6. Submerge the novelty as suggested until it is below the surface level of the water.

➤ **Ice-pop.** Use a clamp, tongs, or your fingers to hold the stick(s) and submerge the ice-pop to the level marked in Step 3 of the Test Procedure.

➤ **Cone.** Shape the wire into a loop, and use it to push the cone, headfirst (ice cream portion first) into the prepared, chilled water. Do not completely submerge the cone immediately: let water fill the cone through the hole made in Step 3 of the Test Procedure before completely submerging the novelty.

➤ **Sandwich or cup.** Skewer the novelty with the thin wire or form a loop on the end of the wire to push the sandwich or ice cream portion or cup completely below the liquid level.

9.7. Record the total water volume in the graduate.

➤ For a cone or sandwich, record the water volume as the net volume and go to Step 119.

➤ For ice-pops or cups, record the water volume in the graduate as the gross volume and go to Step 108.

10.8. Refill the displacement vessel with prepared, chilled water to overflowing and reposition the empty graduate under the spout. After the cup and novelty contents have been submerged, remove the novelty from the cup to determine the volume of the cup.

➤ **Ice-pop.** Melt the ice-pop off the stick or sticks. Submerge the stick or sticks to the line marked in Step 3. Record the volume of tare material (i.e., stick) by measuring the water displaced into the graduate. The net volume for the ice-pop is the gross volume recorded in Step 97 minus the volume of the tare materials in this step. Record this volume as the “volume of novelty.” To determine the error in the package, subtract the labeled quantity from the volume of novelty.

➤ **Cup.** Remove the novelty from the cup. Rinse the cup, and then submerge it in the displacement vessel. Small pinholes in the base of the cup can be made to make submersion easier. Record the volume of water displaced into the graduate by the cup as the volume of tare material. The net volume for the novelty is the gross volume determined in Step 97 minus the volume of the tare materials determined in this step. Record this as the net volume of the novelty. To determine the error in the package, subtract the labeled quantity from the volume of novelty.

11.9. Clean and air-dry the tare materials (sticks, wrappers, cup, lid, etc.). Weigh and record the weight of these materials for the package.

12.10. Subtract the tare weight from the gross weight to obtain the net weight and record this value.

<p><u>13.14.</u> Compute the weight of the labeled volume for the package using the following formula and then record the weight:</p> $\text{Product Density} = (\text{product net weight in Step } \underline{12.10}) \div (\text{the total water volume in Step } \underline{9.7} - \text{volume of tare material in Step } \underline{10.8})$ $\text{Weight of labeled volume} = (\text{labeled volume}) \times (\text{Product Density})$
<u>14.12.</u> Repeat Steps 3 through <u>13.14</u> for a second package.
<u>15.13.</u> If the weight of the labeled volumes in Step <u>13.14</u> for the two packages differs from each other by more than one division on the scale, the gravimetric test procedure cannot be used to test the sample for compliance. If this is the case, use Steps 3 through <u>10.8</u> for each of the remaining packages in the sample to determine their net volumes and package errors. Then go to evaluation of results. If the weights of the labeled volumes agree within one division, continue to Step <u>16.14</u> to test the rest of the sample using the gravimetric test procedure.*
<u>16.14.</u> Use Section 2.3.5.1. “Determination of Tare Sample and Average Tare Weight” to determine the Average Used Dry tare Weight of the sample.
<u>17.15.</u> Find the Average Product Density by adding the densities of the product from the two packages and dividing the sum by two.
<p><u>18.16.</u> Using the weight of labeled volume determined in Step <u>13.14</u>, calculate the Average Product Weight by multiplying the weight of the labeled volume by the average product density.</p> $\text{*Average Product Weight} = \text{Labeled Volume} \times \text{Average Product Density}$
<p><u>19.17.</u> Calculate the “nominal gross weight” using the formula:</p> $\text{Nominal Gross Weight} = \text{Average Product Weight} + \text{Average Used Dry Tare Weight}$
<u>20.18.</u> Weigh the remaining packages in the sample.
<u>21.19.</u> Subtract the nominal gross weight from the gross weight of each package to obtain package errors in terms of weight.
Note: Compare the sample packages to the nominal gross weight.
<u>22.20.</u> Determine the average package error by totaling all package errors and dividing by the number of packages in the sample.
To convert the average error or package error from weight to volume, use the following formula:
$\text{Package Error in Volume} = (\text{Package Error in Weight}) \div (\text{Average Product Density})$

Testing Data

Data Analysis and Summary Justification

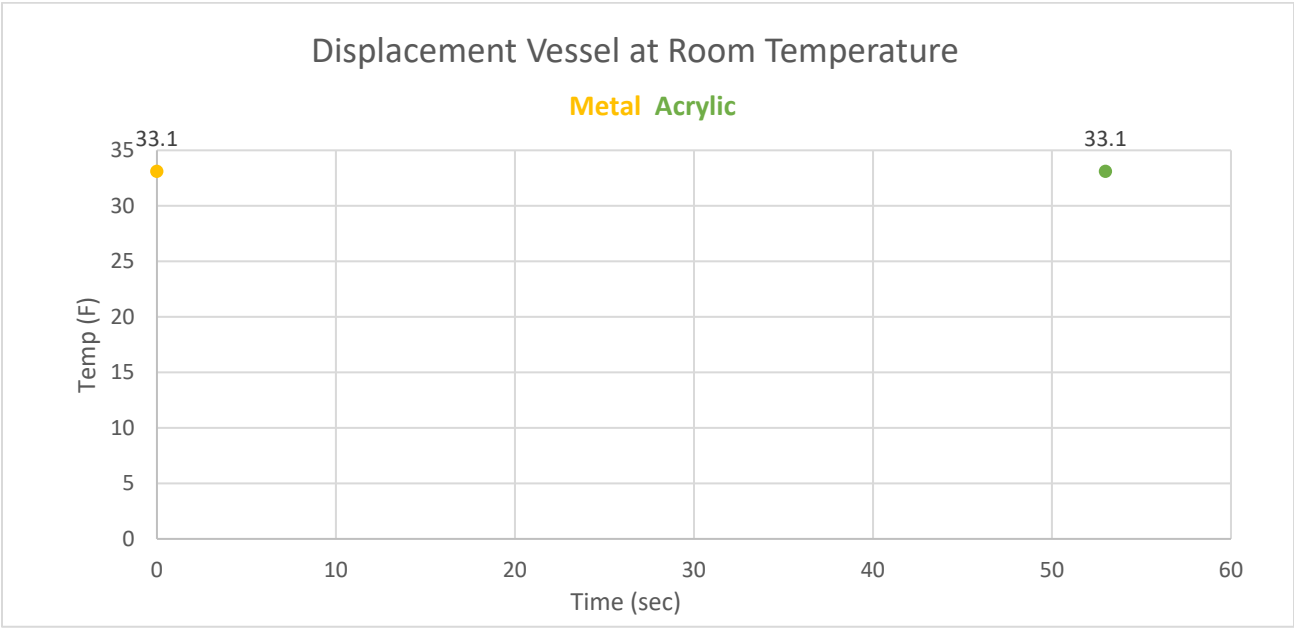
The following data summarizes the test of various materials for displacement vessels for this procedure. Materials considered were acrylic and metal in a variety of settings (ambient, with insulation, with insulation and prior chilling in freezer). These materials were chosen to reflect the variety used in typical, current displacement vessel fabrication.

The acrylic displacement vessel, combined with the insulation shield (with prior chilling), had the most favorable and reliable results for temperature stability. With the insulation and prior chilling, temperature stability in the acrylic displacement vessel significantly increased from 53 seconds of maintaining the temperature below 33.1 °F to 93 minutes and 53 seconds.

I. Displacement Vessel at Room Temperature (Without Insulation Shield)

Data below recorded length of time that water temperature stayed below 33.1°F.

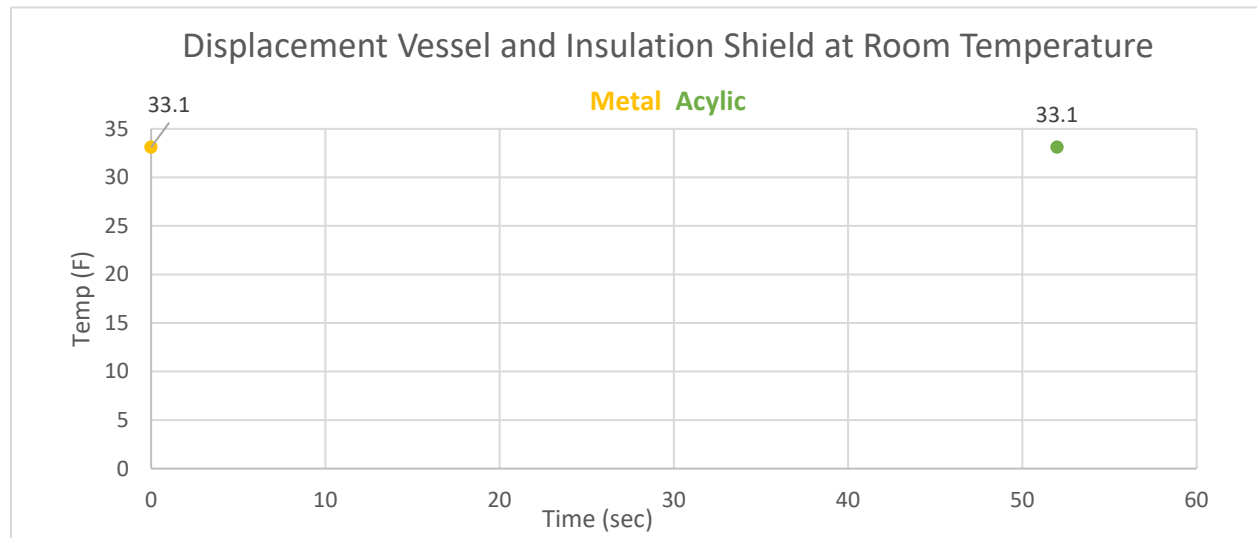
Tester Material	Time (min: sec)
Metal	00:00
Acrylic	00:53



II. Displacement Vessel at Room Temperature (With Insulation Shield)

Data below recorded length of time that the water temperature stayed below 33.1°F.

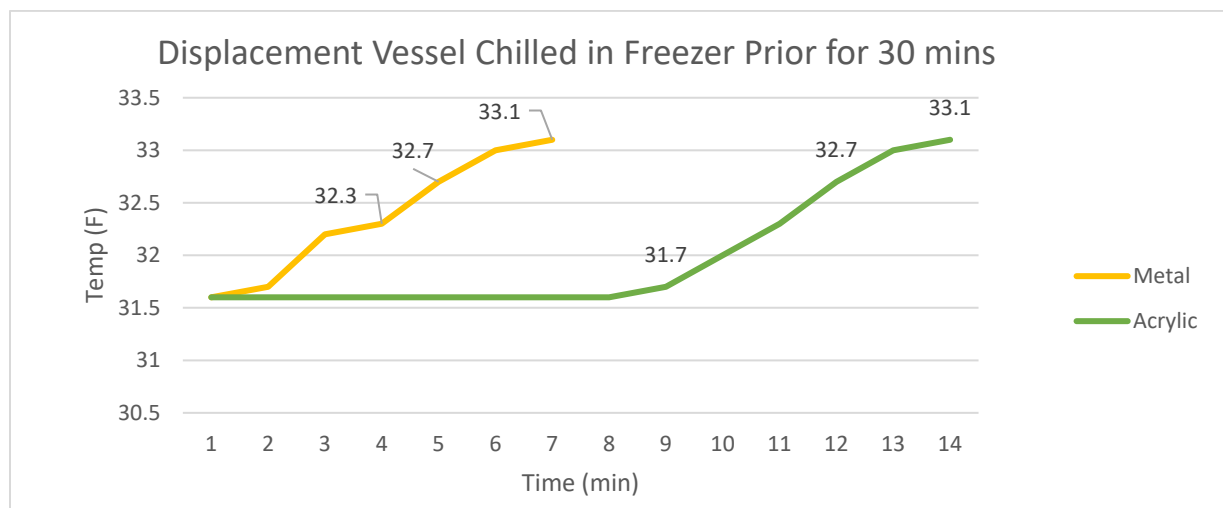
Tester Material	Time (min: sec)
Metal	00:00
Acrylic	00:52



III. Displacement Vessel Chilled in Freezer for 30 minutes Prior to Test (Without Insulation Shield)

Prior to the testing, the displacement vessel was chilled in freezer prior to test for half an hour (30 mins). Data below recorded length of time that the water temperature stayed below 33.1°F.

Tester Material	Time (min: sec)
Metal	06:30
Acrylic	13:22

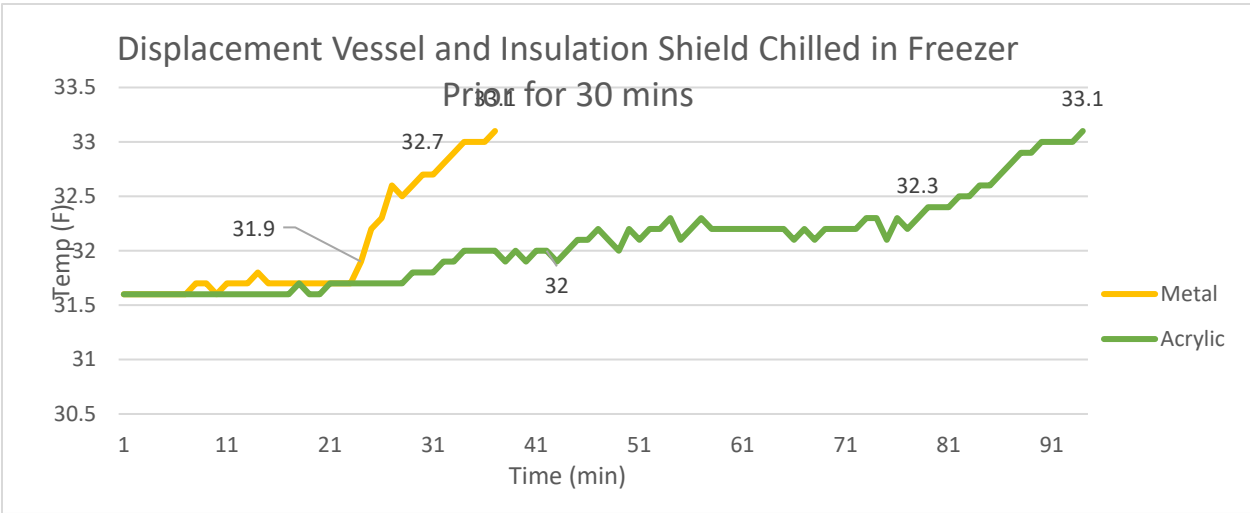


IV. Displacement Vessel and Insulation Shield Chilled in Freezer for 30 minutes Prior to Test

Prior to the testing, displacement vessel and insulation shield chilled in freezer for half an hour (30 mins). Data below recorded length of time that the water temperature stayed below 33.1°F.

Tester Material	Time (min: sec)
Metal	36:16
Acrylic	93:50

III.



SWMA 2023 Annual Meeting: The SWMA recommends a developing status for this item and would like the following areas of concern to be addressed:

- Additional safety concerns when handling dry ice (OSHA requirements)
- Costs associated to the test method (specifically dry ice and equipment)
- Additional data from other states (i.e., repeatability)
- Applicability to other states
- Address other ice creams products not included in the definition of novelty

NEWMA 2023 Interim Meeting: Marc Parquette, VT – Has received complaints involving short measure, very difficult testing procedures. The item needs to address the use of kerosene in the testing protocol (remove it).

Walt Remmert, PA - Agrees this should stay as developing.

Jim Willis, NY – Related that it is a very messy procedure that can't be done on site in stores. The committee recommends this as a developing 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.

NET-24.2 Section 4.9. Procedure for Checking the Contents of Specific Agriculture Seed Packages Labeled by Count., and Appendix D. AOSA Rules for Testing Seeds.

Source:

Louisianan Department of Agriculture and Forestry

Purpose:

Align Chapter 4.9. Procedure for Checking the Contents of Specific Agriculture Seed Packages Labeled by Count and Appendix D. AOSA Rules for Testing Seeds with recent changes to Association of Official Seed Analyst (AOSA) Rules.

Item Under Consideration:

Amend Handbook 133, Checking the Net Contents of Packaged Goods, as follows:

4.9. Procedure for Checking the Contents of Specific Agriculture Seed Packages Labeled by Count

The following method shall be employed when using a mechanical seed counter to determine the number of seeds contained in a sample of soybean (*Glycine max*), corn (*Zea mays*), wheat (*Triticum aestivum*) and field bean (*Phaseolus vulgaris*) **and other seeds kinds. CAUTION: A mechanical seed counter may not be appropriate to use for counting all seed kinds.**

4.9.2. Test Procedure

1. Testing samples shall be received and retained in moisture proof containers until the weight of the sample prepared for purity analysis is recorded. The sample shall be of at least 500 grams for soybean, **and** field beans, and 100 grams for wheat. **The sample weight for other seed kinds being tested shall be the weight of the purity exam listed in AOSA Rules Volume 1 Table 2A.**

and

Appendix D. AOSA Rules for Testing Seeds

SECTION 12: MECHANICAL SEED COUNT

The following method shall be employed when using a mechanical seed counter to determine the number of seeds contained in a sample of soybean (*Glycine max*), corn (*Zea mays*), wheat (*Triticum aestivum*) and field bean (*Phaseolus vulgaris*) **and other seeds kinds. CAUTION: A mechanical seed counter may not be appropriate to use for counting all seed kinds.**

12.1 Samples

Samples for testing shall be of at least 500 grams for soybean, corn and field beans and 100 grams for wheat. **The sample weight for other seed kinds being tested shall be the weight of the purity exam listed in AOSA Rules Volume 1 Table 2A, and All samples shall be** received in moisture proof containers. Samples shall be retained in moisture proof containers until the weight of the sample prepared for purity analysis is recorded.

12.2 Seed counter calibration

...

(b) Carefully pour the 1,000 seed calibration sample into the seed counter. Start the counter and run it until all the seeds have been counted. The seeds should not touch as they run through the counter. Record the number of seeds as displayed on the counter read out. The seed count should not vary more than +/- 2 seeds from 1,000. If the count is not within this tolerance, clean the mirrors, adjust the feed rate and/or reading sensitivity. Rerun the

1 calibration sample until it is within the +/- 2 seed tolerance. If the seed counter continues to fail the calibration
2 procedure and the calibration sample has been checked to ensure that it contains 1,000 seeds, do not use the
3 counter until it has been repaired. and then verified using the 1,000 seed calibration sample.

4 **CAUTION: If the 1,000 seed calibration sample for a non-listed seed kind being counted always varies**
5 **more than the permitted +/- 2 seeds from 1,000, then the use of the mechanical seed counter is not**
6 **appropriate for that seed kind and must not be used for counting.**

7 **Previous Status:**

8 2024: New Proposal

9 **Original Justification:**

10 The primary purpose of this proposal is to clarify that the mechanical seed counting process (outlined in AOSA Rules
11 Vol.1 Section 12) may be used to determine the number of seeds contained in a sample of additional crop kinds not
12 listed. The mechanical seed counter must be proven it is fit for purpose (suitable) for seed kinds not listed, by using a
13 1,000 seed calibration sample of the seed kind under consideration. This proposal would provide a standardized
14 mechanical seed counter calibration procedure for all models of mechanical seed counters being used across the United
15 States, to determine the number of seeds per pound and/or for the purpose of packaging seeds by count

16 The submitter acknowledged the following:

17 1) Some mechanical seed counters have an automatic calibration feature that allows the device to automatically adjust
18 the settings to accurately count the seeds. Thus, there is no need to require mechanical seed counters to be calibrated
19 and/or verified using a 1,000 seed calibration sample.

20 2) AOSA Rules Volume 1 Section 14.9 only has maximum tolerances for comparing two seed count test results for
21 corn, field bean, soybean, and wheat. Two mechanical seed counts for seed kinds not listed cannot be compared since
22 there are no tolerances. Thus, there is no need to require mechanical seed counters to be calibrated using a 1,000 seed
23 calibration sample to confirm if the counter is suitable for use for kinds of seeds not listed in Section 14.9

Seed Counter 1000 Seed Calibration Verification Record

IMD Model 750-2CS

v23MAR2018

[illegible]

**Note: Sensitivity and Length Rejection settings located inside of top access panel.*

Procedure:

- >Ensure all counter setting are on the appropriate set points for the crop being counted
- >Carefully pour the 1,000 seed calibration sample of the crop being counted into seed counter bowl
- >Start counter and run until all seeds have been counted
- >Record number of seeds as displayed on counter display and any additional seeds remaining in bowl
- >Calibration count should not vary more than ± 2 seeds from the 1,000 seed calibration sample
- >If count is not within the tolerance, check settings, clean appropriate areas of the counter
- >Rerun calibration sample up to 3 times to confirmed that the counter may not be working appropriately
- >If count is not within the ± 2 seed tolerance then manually count calibration sample to confirm 1,000 seeds
- >If calibration sample does not contain 1000 seeds, adjust as needed by adding or removing seeds
- >If calibration sample is correct, adjust speed and/or sensitivity settings until ± 2 seed tolerance is obtained
- >If seed counter continues to fail calibration check, do not use until counter has been repaired and then verified using the 1,000 seed calibration sample

Seed Counter 1000 Seed Calibration Verification Record

IMD Model 750-2CS

v23MAR2018

[illegible]

**Note: Sensitivity and Length Rejection settings located inside of top access panel.*

Procedure:

- >Ensure all counter setting are on the appropriate set points for the crop being counted
- >Carefully pour the 1,000 seed calibration sample of the crop being counted into seed counter bowl
- >Start counter and run until all seeds have been counted
- >Record number of seeds as displayed on counter display and any additional seeds remaining in bowl
- >Calibration count should not vary more than ± 2 seeds from the 1,000 seed calibration sample
- >If count is not within the tolerance, check settings, clean appropriate areas of the counter
- >Rerun calibration sample up to 3 times to confirmed that the counter may not be working appropriately
- >If count is not within the ± 2 seed tolerance then manually count calibration sample to confirm 1,000 seeds
- >If calibration sample does not contain 1000 seeds, adjust as needed by adding or removing seeds
- >If calibration sample is correct, adjust speed and/or sensitivity settings until ± 2 seed tolerance is obtained
- >If seed counter continues to fail calibration check, do not use until counter has been repaired and then verified using the 1,000 seed calibration sample

Seed Counter 1000 Seed Calibration Verification Record

IMD Model 750-2CS

v23MAR2018

[illegible]

**Note: Sensitivity and Length Rejection settings located inside of top access panel.*

Procedure:

- >Ensure all counter setting are on the appropriate set points for the crop being counted
- >Carefully pour the 1,000 seed calibration sample of the crop being counted into seed counter bowl
- >Start counter and run until all seeds have been counted
- >Record number of seeds as displayed on counter display and any additional seeds remaining in bowl
- >Calibration count should not vary more than ± 2 seeds from the 1,000 seed calibration sample
- >If count is not within the tolerance, check settings, clean appropriate areas of the counter
- >Rerun calibration sample up to 3 times to confirmed that the counter may not be working appropriately
- >If count is not within the ± 2 seed tolerance then manually count calibration sample to confirm 1,000 seeds
- >If calibration sample does not contain 1000 seeds, adjust as needed by adding or removing seeds
- >If calibration sample is correct, adjust speed and/or sensitivity settings until ± 2 seed tolerance is obtained
- >If seed counter continues to fail calibration check, do not use until counter has been repaired and then verified using the 1,000 seed calibration sample

Mechanical Seed Counters Operation Manual Review:

The following mechanical seed counter information and operational manuals were briefly reviewed to determine if a 1,000 seed calibration sample was required or encouraged to be used to calibrate the device. While a few devices stated they had an automatic calibration and/or adjustment process, none of the manuals stated using a 1,000 seed calibration sample to confirm the accuracy of the device before use.

1. Wintersteiger Seed Counter S-25+

<https://www.wintersteiger.com/us/Plant-Breeding-and-Research/Products/Product-range/Laboratory-preparation/66-Seed-Count-S-25plus>



2. Agri-Instrument SLY-E High Accuracy Automatic Seed Counter

<https://www.agri-instrument.com/wp-content/uploads/2018/05/SLY-E-High-Accuracy-Automatic-Seed-Counter.pdf>



3. Data Technologies DATA Count S-25 Plus

<https://data-technologies.com/wp-content/uploads/2017/09/Seed-Counter-S-25.pdf>



. Seedburo Count-A-Pak 801

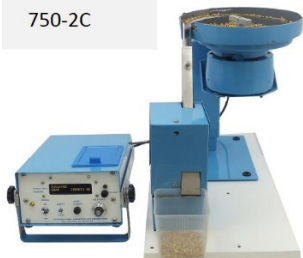
https://cdn.shopify.com/s/files/1/0070/8041/1191/files/801_Manual.pdf?v=1614276180



5. International Marketing and Design (IMD) Technologies Totalizer 750-2 C Series

<http://www.seedcounters.com/index.php/counting/summary?id=148>

750-2C



6. Pfeuffer Contador

<https://www.pfeuffer.com/product/contador>



The submitter requested Voting status for this item in 2024.

Comments in Favor:

Regulatory:

-

Industry:

-

Advisory:

-

Comments Against:

Regulatory:

-

Industry:

-

Advisory:

-

Neutral Comments:

Regulatory:

-

Industry:

-

Advisory:

-

Item Development:

New Proposal

Regional Associations' Comments:

New Proposal

CWMA 2023 Interim Meeting: No comments were heard.

The committee recommends this item be informational for more comments to come in.

WWMA 2023 Annual Meeting: Matt Douglas, California Department of Food and Agriculture, Division of Measurement Standards stated he was not familiar with the testing procedure, but was not against the proposal. Mr. Douglas was hoping for more discussion on this item.

The WWMA L&R Committee recommends this item be Informational.

SWMA 2023 Annual Meeting: The SWMA recommends a Voting status for this item pending copyright approval to be included into HB 133.

NEWMA 2023 Interim Meeting: Jim Willis, NY – New York has a seed lab and the director of this lab is in favor of this being a voting item.

Walt Remmert, PA – Concurs with NY.

Lou Sakin, Holliston, MA - Recommends it move forward as 'Voting' item.
The committee recommends this as a voting item.

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

OTH – OTHER ITEMS

OTH-24.1 X. Uniform Shipping 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 Shipping Law as follows:

X. Uniform Shipment Law

Section 1. Purpose

The purpose of this Act is to ensure the accurate shipment of 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:

X.X. Goods

All things which are movable and can be transported.

X.X. Carrier

The business that transports an amount of goods.

X.X. Shipper

Individuals or businesses that send goods using a carrier.

X.X. Shipment

A quantity of goods shipped with a carrier.

X.X. Freight

Goods or charges.

X.X. Freight Broker

The intermediary between the shipper and the carrier who facilitates the transportation of goods.

X.X. Quote

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

X.X. Bill of Lading (BOL)

A legal instrument used in the transportation and shipping industries which lists the goods being shipped and the terms under which they will be delivered.

X.X. Progressive Number (Pro Number)

A series of numbers used by carriers to identify and then track a specific order tendered to a specific carrier.

X.X. Inspection Certificate

A document used to signify that shipped goods have been inspected pertaining, but not limited to, classification, density, weight, or measure.

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

Section 4. Enforcing officer: Rules and Regulations

The Director is authorized to:

(a) enforce the provisions of this Act;

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

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

(1) adherence to quotes when correct documentation is provided to the carrier;

(2) weighing and measuring practices that must be followed;

(3) the required information to be submitted to the shipper if there is a correction fee applied; and

(4) the period of recordkeeping.

Section 5. Weighing and Measuring Practices and Equipment Used

A carrier shall use the following weighing and measuring practices and equipment:

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

3 (b) examined, tested, and approved for use by a weights and measures officer of this state.

4 Section 6. Weighing Device Used:

5 A carrier shall use a scale in accordance with the manufacturer's approved application of the device.

6 Section 7. Measuring Device Used:

7 A carrier shall use a measuring device in accordance with the manufacturer's approved application of the
8 device.

9 Section 8. Inspection Certificate: Required Entries

10 (a) The documentation, when properly completed and signed shall be prima facie evidence of the accuracy
11 of the procedure followed and the recorded results.

12 (b) The design of and the information to be furnished on the documentation shall be prescribed by the
13 Director and will include, but not be limited to, the following:

14 (1) the name and employee ID# of the individual who conducts the inspection;

15 (2) date and time of the inspection;

16 (3) signature of the employee who conducts the inspection (digital signature accepted);

17 (4) identifying information of the weighing or measuring device used to conduct the inspection to include
18 the associated make, model, serial number, and Certificate of Conformance number, if applicable;

19 (5) indicated reweigh or remeasure value from the weighing device or measuring device;

20 (6) provide detailed information on the process used to reclassify a shipment according to type of goods
21 and/or shipment density;

22 (7) provide the dollar amount of the correction fee applied and the description of the fee;

23 (8) identifying information for the issuing terminal to include physical address and contact name of
24 terminal manager to include phone number and/or email address;

25 (9) identifying information for both the Pro Number and BOL, if applicable;

26 (10) the name and address of the shipper from point of origin;

27 (11) the tendered classification, density, weight, or measurement provided from the shipper and freight
28 broker, if applicable; and

29 (12) the declared classification, density, weight, or measurement determined by the carrier and freight
30 broker, if applicable.

1 Section 9. Copies of Inspection Certificates

2 The carrier shall keep and preserve for the period specified in the regulations a legible copy of each
3 inspection certificate issued to the shipper and freight broker, if applicable. The certificates shall be available
4 for inspection by any weights and measures officer during normal office hours.

5 Section 10. Prohibited Acts

6 No entity shall

7 (a) provide a false classification, density, weight, or measurement;

8 (b) violate any provisions of this Act or any regulation promulgated under this Act; or

9 (c) use or have in their possession a device which has been altered to facilitate fraud.

10 Section 11. Civil Penalties

11 11.1. Assessment of Penalties. – Any entity who by themselves or by their servant or agent commits any of the
12 acts enumerated in Section 14. Validity of Prosecutions may be assessed by the _____ a civil penalty of:

13 (a) not less than \$ nor more than \$ for a first violation,

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

15 (c) not less than \$ nor more than \$ for a third violation within from the date of the first violation.

16 11.2. Administrative Hearing. – Any entity subject to a civil penalty shall have a right to request an
17 administrative hearing within _____ days of receipt of the notice of the penalty. The Director or their
18 designee shall be authorized to conduct the hearing after giving appropriate notice to the respondent. The
19 decision of the Director shall be subject to appropriate judicial review.

20 11.3. Collection of Penalties. – If the respondent has exhausted their administrative appeals and the civil
21 penalty has been upheld, they shall pay the civil penalty within _____ days after the effective date of the
22 final decision. If the respondent fails to pay the penalty, a civil action may be brought by the Director in any
23 court of competent jurisdiction to recover the penalty. Any civil penalty collected under this Act shall be
24 transmitted to _____.

25 Section 12. Criminal Penalties

26 12.1. Misdemeanor. – Any entity who by themselves or by their servant or agent commits any of the acts
27 enumerated in Section 10. Prohibited Acts or violates any other provision of this Act shall be guilty of a Class
28 _____ misdemeanor and upon conviction shall be punished by a fine not less than \$ _____, nor
29 more than \$ _____, or by imprisonment for not less than _____ nor more than _____, or
30 both fine and imprisonment.

31 12.2. Felony. – Any entity who by themselves or their servant or agent who intentionally commits any of the
32 acts enumerated in Section 1. Prohibited Acts or repeatedly violates any other provision of this Act shall be
33 guilty of a Class _____ felony and upon conviction shall be punished by a fine not less than \$ _____
34 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:

2024: New Proposal

Original Justification:

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

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

The submitter requested Voting status in 2024.

Comments in Favor:

Regulatory:

-

1 **Industry:**

- 2 •

3 **Advisory:**

- 4 •

5 **Comments Against:**

6 **Regulatory:**

- 7 •

8 **Industry:**

- 9 •

10 **Advisory:**

- 11 •

12 **Neutral Comments:**

13 **Regulatory:**

- 14 •

15 **Industry:**

- 16 •

17 **Advisory:**

- 18 •

19 **Item Development:**

20 New Proposal.

21 **Regional Associations' Comments:**

22 New Proposal

23 CWMA 2023 Interim Meeting: Mike Harrington, Iowa commented he does not fully understand the purpose of this
24 item. He asks for clarification from the submitter. At this point he would recommend withdrawing the item because
25 he doesn't understand how it relates to weights and measures.

26 The committee recommends withdrawal. More information is needed to clarify the intent of this item.

27 WWMA 2023 Annual Meeting: Steven Harrington, State of Oregon stated that he had no preference in opposition or
28 support for this item. Mr. Harrington stated we might run into a situation where we are getting into regulating interstate
29 commerce, so this item needs to be vetted, possibly by a task group, to ensure we get the details right.

30 Matt Douglas, California Department of Food and Agriculture, Division of Measurement Standards echoed Mr.
31 Harrington's comments, with the additional statement that more input would be needed from impacted industries, and
32 may need to be addressed by a task group. Mr. Douglas stated this should be a developing item.

33 Kurt Floren, County of Los Angeles, California echoed previous speakers, adding that there has been fraud for many,
34 many years in this area, particularly in the moving industry, with no record of re-weighments, and possessions being
35 held, so it would seem that something needs to be done. However, this would be stepping heavily into interstate
36 commerce with little justification. Mr. Floren states there needs to be additional justification, and recommends this
37 item be Informational and to call for broad nationwide input.

The WWMA L&R Committee recommends this item be Informational.

SWMA 2023 Annual Meeting: The SWMA L &R Committee does not see any merit in the language as provided and recommends this item be withdrawn.

NEWMA 2023 Interim Meeting: Cheryl Ayer, NH – Provide a presentation and Power Point slide deck to NEWMA. The expectation is to create rules for shipping (and reweighing) products nationwide. She is willing to participate or chair a task group.

Walt Remmert, PA - Recognizes this is a problem and thanks NH for taking on this issue. PA supports the item and has a volunteer to work on the task group if one is organized.

Lou Sakin, Holliston, MA - Commends NH for her presentation, Questions if this is an interstate commerce issue and which agencies need to get involved? Seeking help from other jurisdictions for input and help with these issues. Perhaps a task group is appropriate.

Jason Flint, NJ – Likes the idea and wants it to be further developed.

The committee recommends this item as a developing 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-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 2023 Annual Meeting: Ms. Vanessa Benchea verbally updated the Committee. She also provided the following written report on the activities of the Fuels and Lubricants Subcommittee (FALS) which reports and provides recommendations to the Laws and Regulations Committee.

For more information or to provide comment, please contact the FALS Chair:

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

FALS met on Sunday, July 30, 2023, at the 2023 NCWM Annual Meeting in Norfolk, VA to review items related to fuel and automotive fluid standards that appear on the L&R agenda. Updates were provided for assigned Block items 1 & 6, proposed changes to item Block 2 were discussed and two new business items, Drag Reducing Agent in Retail Diesel and Editorial Standards when referencing citations from Federal Government Agencies, were presented.

For Item Block 1 (B1) Renewable Diesel and Diesel, Chuck Corr (Corr Consulting) provided the latest developments of this item to FALS which included language updates that resulted from the informal focus group. While there wasn't full consensus of the language provided, FALS did feel that it was ready to advance to the regional committees and that it should be included in Publication 15. At this time the informal focus group is on hiatus until after the fall regional meetings where the group will then reconvene and discuss any changes that may be needed. Any updates to this proposal, will then be presented at the Interim.

For Item Block 6 Transmission Fluid, the Informal Focus Group chair, Joanna Johnson (Automotive Oil Change Association) provided a statement on behalf of the group that indicated that they could not agree on a practical approach to provide language for the original agenda item. They recommend this approach should no longer be pursued and the items be withdrawn. On behalf of the Informal Focus Group, Ms. Johnson also recommended that a new group with a focus on EV fluids be formed. There was no opposition from FALS for either recommendation.

For Item Block 2 (B2) Gasoline: Chuck Corr presented to the group several identified recommended changes to the Block 2 items in Publication 16 that had been suggested by the team at OWM. FALS recommends making these changes as suggested.

Mr. Brian Kernke (Love's Travel Stores) presented information on the impacts that unsheared drag reducing agents have had on Love's business and stated that there had also been impacts at retail stations as well as truck drivers. He indicated it was expensive to replace filters and the associated downtime at retail. Mr. Bill Striejewski (Nevada) indicated that they had seen these issues in Nevada and that it was causing dispensers to flow so slow that shutoffs weren't working properly.

Chuck Corr (CC consulting) spoke on the proposed NIST established editorial standards in which he voiced his concerns on including the year regarding citations to Federal Government Agencies. There was general agreement from FALS that it should be the Name, Volume, Source Section xxx. FALS will request that dates are not included when referencing citations from federal government agencies.

Item Block 6 (B6) Transmission Fluid

The following statement was provided by Joanna Johnson (Automotive Oil Change Association), Transmission Fluid Focus Group Chair:

The Transmission Fluid Focus Group has devoted several years to investigating vehicle transmission fluid labeling. At this time, this focus group could not agree on a practical approach to designate certain transmission fluids as "obsolete" for a variety of reasons, including lack of a comprehensive and consistent standards setting organization mechanism, automakers' ongoing use of older specifications, and the sufficiency of current NIST Handbook 130 requirements. Therefore, the original amendment approach in B6: MOS-21.1. A Section 2.36.2. *Labeling and Identification of Transmission Fluid* and B6: FLR-21.2. A Section 3.14.1. *Labeling and Identification of Transmission Fluid* should no longer be pursued. The Focus Group proposes to switch efforts to developing consumer protection language for labels necessary to distinguish EV fluids from Fuel Cell vehicle fluids and traditional CEV coolant, as well as EV transmission fluids from gear oil.

With this feedback from the TFG, FALS recommends withdrawal of this block of items and formation of the new the focus group for EV fluids.

Regional Associations' Comments:

CWMA 2023 Interim Meeting: No comments were heard.

The committee recommends this remain developing.

WWMA 2023 Annual Meeting: No comments were heard on this item. The WWMA L&R Committee would like to thank FALS for their continued work and any report we may see in the future.

The WWMA L&R Committee recommends this as a Developing item.

SWMA 2023 Annual Meeting: No comments were heard from the floor. The committee recommends this remains as a developing item.

NEWMA 2023 Interim Meeting: No Comments
The committee recommends this as a developing 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-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 comment, please contact the PALS Chair:

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

PALS is comprised of four voting regulatory officials (one from each region) and four voting members from industry (retailers and manufacturers) in addition to its Chair and NIST Technical Advisor. Members of NCWM can participate in the PALS meetings by contacting Chair Guay. PALS work is being developed through monthly webinar meetings and at the NCWM meetings. PALS members are responsible for providing updates at their Regional Meetings. Chair Guay added PALS will be developing proposals and in addition providing guidance and recommendations on existing proposals as assigned by the NCWM L&R Committee. He stressed the importance of having key federal agencies (FDA, FTC, and USDA) participating.

Item Development:

NCWM 2023 Interim Meeting: Chairman Chris Guay provided the following written report on the activities of the Packaging and Labeling Subcommittee to the Laws and Regulations Committee.

At the 2023 NCWM Interim Meeting, Chairman Guay conducted a detailed review of the status and next steps for the proposed e-commerce regulation on the L&R agenda. PALS confirmed the only further comments received by any member were minor edits suggested by NIST in mid-December. PALS reviewed the edits to determine which should be brought before the committee during open hearings and to be included in the proposal following the annual meeting

and which could be made editorially with at the discretion of L&R. Based on all member input, PALS will recommend the proposal for Voting status at the L&R open hearing.

PALS has a video meeting scheduled with US Federal Trade Commission to provide FTC with and overview of the NCWM, PALS, and the e-commerce proposal.

PALS will focus its efforts after the 2023 Interim Meeting to continue outreach on the e-commerce proposal and to finalize an NCWM best practice document on the topic of quantity-related statements appearing on a package PDP.

NCWM 2023 Annual Meeting: Mr. Christopher Guay, PALS, Chairman informed the Committee that the PALS meeting focused on E-Commerce and the attendees were encouraged to stand and speak during open hearings.

Regional Associations' Comments:

CWMA 2023 Interim Meeting: Chris Guay, PALS Chairperson provided an activity update and invited interested attendees to be active members of the committee. He reported PALS is working on an E-commerce document which should be available in January.

The committee recommends this remain developing.

WWMA 2023 Annual Meeting: No comments were heard on this item. The WWMA L&R Committee would like to thank PALS for their continued work and any report we may see in the future. The WWMA L&R Committee recommends this as a Developing item.

SWMA 2023 Annual Meeting: No comments were heard from the floor. The committee recommends this as a Developing item.

NEWMA 2023 Interim Meeting: No Comments. The Committee recommends this as a developing 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) RENEWABLE DIESEL AND DIESEL

Source:

CC Consulting, LLC

Purpose:

Further refine the changes related to biodiesel made at the 2022 annual meeting. This proposal also includes needed updates related to renewable diesel.

B1: MOS-23.1 A Sections 2.31. Biodiesel and biodiesel Blends that Contain Greater Than or Equal to 21% by Volume Biodiesel, and 2.40. Diesel Fuel.

Item under Consideration:

Amend Handbook 130, Uniform Regulation for the Method of Sale of Commodities as follows:

2.31. Biodiesel and Biodiesel Blends that contain greater than or equal to 21 % by volume biodiesel.

2.31.1. Identification of Product. – Biodiesel shall be identified by the term “Biodiesel” with the designation “B100.” ~~Biodiesel~~ Blends that contain greater than 20 % by volume biodiesel shall be identified by the term “Biodiesel Blend.”

2.31.2. Labeling of Retail Dispensers.

2.31.2.1. Labeling of Grade Required. – Biodiesel and biodiesel blends that contain greater than 20 % by volume biodiesel shall be identified in accordance with both EPA and FTC requirements.

~~**2.31.2.2. Automotive Fuel Rating.** – Biodiesel and biodiesel blends shall be labeled with its automotive fuel rating in accordance with 16 CFR 306.~~

2.31.2.3. Biodiesel Blends. – When biodiesel blends greater than 20 % by volume are offered by sale, each side of the dispenser where fuel can be delivered shall have a label conspicuously placed that states “Consult Vehicle Manufacturer Fuel Recommendations.” The lettering of this legend shall not be less than 6 mm (1/4 in) in height by 0.8 mm (1/32 in) stroke; block style letters and the color shall be in definite contrast to the background color to which it is applied.

2.31.3. Documentation for Dispenser Labeling Purposes. – The retailer shall be provided, at the time of delivery of the fuel, a declaration of the volume percent biodiesel on an invoice, bill of lading, shipping paper, or other document. This documentation is for dispenser labeling purposes only; it is the responsibility of any potential blender to determine the amount of biodiesel in the diesel fuel prior to blending.

~~**2.31.4. Exemption.** – Biodiesel blends that contain less than or equal to 5 % biodiesel by volume are exempt from the requirements of Sections 2.31.1. Identification of Product, 2.31.2. Labeling of Retail Dispensers, and 2.31.3. Documentation for Dispenser Labeling Purposes when it is sold as diesel fuel.~~

(Added 2008) (Amended 2022, and 20XX)

2.40. Diesel Fuel. – Shall meet the following requirements, based on the biodiesel concentration of the fuel:

(a) Diesel fuel that contains less than or equal to 5 % by volume biodiesel shall meet the latest version of ASTM D975, “Standard Specifications for Diesel Fuels” and shall be sold as diesel fuel.

(b) Diesel fuel that contains greater than or equal to 6 % by volume biodiesel and that contains less than or equal to 20 % by volume shall meet the latest version of ASTM D7467, “Standard Specifications for Diesel Fuel Oil, Biodiesel Blend (B6 to B20).”

(c) Only fuel additive registered with the U.S. EPA may be used to additize diesel fuel, and the final product shall meet the latest version of ASTM D975 and/or ASTM D7467.

2.40.1. Premium Diesel Fuel. – All diesel fuels identified on retail dispensers as premium, super, supreme, or premier must conform to the following minimum requirements.

(a) **Cetane Number.** – A minimum cetane number of 47.0 as determined by the latest version of ASTM D613, “Standard Test Method for Cetane Number of Diesel Fuel Oil.”

NOTE: ASTM D613, “Standard Test Method for Cetane Number of Diesel Fuel Oil” is the referee method; however, the following methods can be used to determine cetane number: the latest version of ASTM D6890, “Standard Test Method for Determination of Ignition Delay and Derived Cetane Number” (DCN) of Diesel Fuel Oils by Combustion in a Constant Volume Chamber”; and ASTM D7668, “Standard Test Method for Determination of Derived Cetane Number (DCN) of Diesel Fuel Oils–Ignition Delay and Combustion Delay Using a Constant Volume Combustion Chamber Method.”

(b) **Low Temperature Operability.** – A cold flow performance measurement which meets the latest version of ASTM D975, “Standard Specification for Diesel Fuel,” tenth percentile minimum ambient air temperature charts and maps by the latest version of either ASTM D2500, “Standard Test Method for Cloud Point of Petroleum Products and Liquid Fuels” or ASTM Standard D4539, “Standard Test Method

for Filterability of Diesel Fuels by Low-Temperature Flow Test (LTFT).” The latest version of ASTM D6371, “Standard Test Method for Cold Filter Plugging Point of Diesel and Heating Fuels” may be used when the test results are a maximum of 6 °C below the Cloud Point. Low temperature operability is only applicable October 1 to March 31 of each year.

(c) **Lubricity.** – A maximum wear scar diameter of 460 micrometers as determined by the latest version ASTM D6079, “Standard Test Method for Evaluating Lubricity of Diesel Fuels by the High-Frequency Reciprocating Rig (HFRR).”

NOTE: The latest version of ASTM D6079, “Standard Test Method for Evaluating Lubricity of Diesel Fuels by the High-Frequency Reciprocating Rig (HFRR)” is the referee method; however, the latest version of ASTM D7688, “Standard Test Method for Evaluating Lubricity of Diesel Fuels by the High-Frequency Reciprocating Rig (HFRR) by Visual Observation” can be used.

(d) **Corrosion.** – A minimum rating of B+ as determined by the most recent version of NACE TM0172, “Determining Corrosive Properties of Cargoes in Petroleum Product Pipelines.”

NOTE: The latest recent version of NACE TM0172 “Determining Corrosive Properties of Cargoes in Petroleum Product Pipelines” is the referee method. The latest version of ASTM D7548 “Standard Test Method for Determination of Accelerated Iron Corrosion in Petroleum Products” can be used.

(e) **Filter Blocking Tendency (FBT)** – A maximum of 2.2 by the latest version of ASTM D2068, “Standard Test Method for Determining Filter Blocking Tendency”, following procedure B.

(f) **Injector Deposit Control.** – Maximum power loss in keep-clean mode of 2 % by the latest version of Coordinating European Council, CEC F-98-08, “Direct Injection, Common Rail Diesel Engine Nozzle Coking Test.”

2.40.2. Use of Other Diesel Terminology. – For any terms other than premium, super, supreme, or premier included in the diesel fuel product or grade name and/or advertisements and claims displayed on dispensers, pump toppers, pole signs and bollard signs which imply improved performance, the product must have a clearly-defined fuel property with a substantiated functional benefit. Such property must be measurable utilizing industry accepted test methodologies developed by recognized standards organizations such as ASTM, SAE, and CEC to allow verification of the improved performance.

2.40.3. Labeling requirements – Diesel fuel containing more than 5 % by volume of biodiesel or more than 5 % by volume of renewable diesel shall be identified in accordance with both EPA and FTC requirements.

(Added 2021) **(amended 20XX)**

B1: FLR-23.1 A Sections 1.9. Biodiesel Blend., 1.27. Fuel Oil., 1.XX. Renewable Diesel., 3.3.2. Automotive Fuel Rating., 3.15. Biodiesel and Biodiesel Blends Containing Greater than 20% by Volume Biodiesel.

Item Under Consideration:

Amend the Uniform Fuels and Automotive Lubricants Regulation as follows:

1.8. Biodiesel. – A fuel comprised of at least 99 % by volume mono-alkyl esters of long chain fatty acids derived from vegetable oils or animal fats, designated B100 or B99.
(Amended 2018)

1.9. Biodiesel Blend. – A fuel comprised of a blend of biodiesel with hydrocarbon diesel fuel **and containing greater than 20 % by volume biodiesel.**

(Amended 2018, and 20XX)

1.15. Diesel Fuel. – A refined hydrocarbon suitable for use as a fuel in a compression-ignition (diesel) internal combustion engine that may contain a combination of biodiesel, renewable diesel, and fuel additives.

(Amended 2018)

1.27. Fuel Oil. – Refined oil middle distillates, heavy distillates, or residues of refining, or blends of these, suitable for use as a fuel for heating or power generation. The fuel may be refined from petroleum or biomass and may contain biodiesel and fuel additives.

1.56. Wholesale Purchaser Consumer. – Any person who is an ultimate consumer of gasoline, fuel methanol, ethanol flex fuel, diesel fuel, biodiesel, biodiesel blends, fuel oil, kerosene, aviation turbine fuels, natural gas, compressed natural gas, or liquefied petroleum gas and who purchases or obtains the product from a supplier and receives delivery of that product into a storage tank.

(Added 1998) (Amended 1999 and 2014)

1.XX Renewable Diesel. – A refined middle distillate hydrocarbon produced from biomass and suitable for use as a fuel in a compression-ignition (diesel) internal combustion engine.

Section 2. Standard Specifications

2.2. Diesel Fuel. – Shall meet the following requirements, based on the biodiesel concentration of the fuel:

(a) Diesel fuel that contains less than or equal to 5 % by volume biodiesel shall meet the latest version of ASTM D975, “Standard Specifications for Diesel Fuels” and shall be sold as diesel fuel.

(b) Diesel fuel that contains greater than or equal to 6 % by volume biodiesel and that contains less than or equal to 20 % by volume shall meet the latest version of ASTM D7467, “Standard Specifications for Diesel Fuel Oil, Biodiesel Blend (B6 to B20).”

(c) Only fuel additive registered with the U.S. EPA may be used to additize diesel fuel, and the final product shall meet the latest version of ASTM D975 and/or ASTM D7467.

(Amended 2003 and 2018)

2.2.1. Premium Diesel Fuel. – All diesel fuels identified on retail dispensers as premium, super, supreme, or premier must conform to the following minimum requirements:

(a) **Cetane Number.** – A minimum cetane number of 47.0 as determined by the latest version of ASTM D613, “Standard Test Method for Cetane Number of Diesel Fuel Oil.”

NOTE: ASTM D613, “Standard Test Method for Cetane Number of Diesel Fuel Oil” is the referee method; however, the following methods can be used to determine cetane number: the latest version of ASTM D6890, “Standard Test Method for Determination of Ignition Delay and Derived Cetane Number” (DCN) of Diesel Fuel Oils by Combustion in a Constant Volume Chamber”; and ASTM D7668, “Standard Test Method for Determination of Derived Cetane Number (DCN) of Diesel Fuel Oils—Ignition Delay and Combustion Delay Using a Constant Volume Combustion Chamber Method.” (Note added 2019)

(b) **Low Temperature Operability.** – A cold flow performance measurement which meets the latest version of ASTM D975, “Standard Specification for Diesel Fuel,” tenth percentile minimum ambient air temperature charts and maps by the latest version of either ASTM D2500, “Standard Test Method for Cloud Point of Petroleum Products and Liquid Fuels” or ASTM D4539, “Standard Test Method for

Filterability of Diesel Fuels by Low Temperature Flow Test, (LTFT).” The latest version of ASTM D6371, “Standard Test Method for Cold Filter Plugging Point of Diesel and Heating Fuels” may be used when the test results are a maximum of 6 °C below the Cloud Point. Low temperature operability is only applicable October 1 to March 31 of each year.

(c) **Lubricity.** – A maximum wear scar diameter of 460 micrometers as determined by the latest version ASTM D6079, “Standard Test Method for Evaluating Lubricity of Diesel Fuels by the High-Frequency Reciprocating Rig (HFRR).”

NOTE: The latest version of ASTM D6079, “Standard Test Method for Evaluating Lubricity of Diesel Fuels by the High-Frequency Reciprocating Rig (HFRR)” is the referee method; however, the latest version of ASTM D7688, “Standard Test Method for Evaluating Lubricity of Diesel Fuels by the High-Frequency Reciprocating Rig (HFRR) by Visual Observation” can be used.
(Note added 2019)

(d) **Corrosion.** – A minimum rating of B+ as determined by the latest version of NACE TM0172, “Determining Corrosive Properties of Cargoes in Petroleum Product Pipelines.”

NOTE: The latest version of NACE TM0172 “Determining Corrosive Properties of Cargoes in Petroleum Product Pipelines” is the referee method. The latest version of ASTM D7548 “Standard Test Method for Determination of Accelerated Iron Corrosion in Petroleum Products” can be used.
(Added 2019)

(e) **Filter Blocking Tendency (FBT).** – A maximum of 2.2 by the latest version of ASTM D2068, “Standard Test Method for Determining Filter Blocking Tendency”, following procedure B.
(Added 2019)

(f) **Injector Deposit Control.** – Maximum power loss in keep-clean mode of 2 % by the latest version of Coordinating European Council, CEC F-98-08, “Direct Injection, Common Rail Diesel Engine Nozzle Coking Test.”
(Added 2019)

2.2.2. Use of Other Diesel Terminology. – For any terms other than premium, super, supreme, or premier included in the diesel fuel product or grade name and/or advertisements and claims displayed on dispensers, pump toppers, pole signs and bollard signs which imply improved performance, the product must have a clearly-defined fuel property with a substantiated functional benefit. Such property must be measurable utilizing industry accepted test methodologies developed by recognized standards organizations such as ASTM, SAE, and CEC to allow verification of the improved performance.
(Added 2019)
(Amended 2003 and 2019)

2.5. Fuel Oils. – Shall meet the latest version of ASTM D396, “Standard Specification for Fuel Oils.”

2.6. Kerosene (Kerosine). – Shall meet the latest version of ASTM D3699, “Standard Specification for Kerosene.”

1 **2.17. Biodiesel Blendstock.** – Biodiesel intended for blending with diesel fuel shall meet the latest version of
2 ASTM D6751, “Standard Specification for Biodiesel Fuel Blend Stock (B100) for Middle Distillate Fuels.” Any
3 blend stock less than 99 % by volume biodiesel (no more than 1 % by volume diesel fuel). Any blend stock less
4 than 99 % by volume shall not be used as a commercial blend stock for biodiesel blends without the permission
5 of the Director.

6 (Added 2004) (Amended 2018)

7 **Section 3. Classification and Labeling for Sale.**

8 **3.1. General Considerations.**

9 **3.1.1. Documentation.** – When products regulated by this rule are sold, an invoice, bill of lading, shipping
10 paper, or other documentation must accompany each delivery other than a retail sale. This document must
11 identify the quantity, the name of the product, the particular grade of the product, the applicable automotive
12 fuel rating, and oxygenate type and content (if applicable), the name and address of the seller and buyer, and
13 the date and time of the sale. Documentation must be retained at the retail establishment for a period not less
14 than one year.

15 (Amended 2008)

16 **3.1.2. Retail Dispenser Labeling.** – All retail dispensing devices must identify conspicuously the type of
17 product (exception: gasoline and gasoline-oxygenate blends), the particular grade of the product (exception:
18 No. 2 Diesel), and the applicable automotive fuel rating.

19 (Amended 2018)

20 **3.1.3. Grade Name.** – The sale of any product under any grade name that indicates to the purchaser that it is
21 of a certain automotive fuel rating or ASTM grade shall not be permitted unless the automotive fuel rating
22 or grade indicated in the grade name is consistent with the value and meets the requirements of Section 2,
23 Standard Specifications.

24 **3.1.4. Nozzle Requirements for Automotive Gasoline, Gasoline-Oxygenate Blends, and Diesel Fuel**
25 **Dispensers.** – Each retail dispensing device from which fuel products are sold shall be equipped with a nozzle
26 spout having a diameter that conforms with the latest version of SAE J285, “Dispenser Nozzle Spouts for
27 Liquid Fuel Intended for Use with Spark-Ignition and Compression Ignition Engines.”

28 (Added 2018)

29 (Amended 2018)

30 **3.3. Diesel Fuel.**

31 **3.3.1. Labeling of Grade Required.** – Diesel Fuel other than No 2-D shall be identified by grade.

32 (Amended 2018)

33 **3.3.2. Automotive Fuel Rating.** – Diesel fuel containing 6 % to 20 % by volume biodiesel **and/or containing**
34 **6 % or greater renewable diesel** shall be labeled with its automotive fuel rating in accordance with the FTC
35 “Automotive Fuel Ratings, Certification and Posting Rule,” 16 CFR 306.

36 (Added 2018)

37 **3.3.3. Delivery Documentation for Premium Diesel.** – Before or at the time of delivery of premium diesel
38 fuel, the retailer or the wholesale purchaser-consumer shall be provided on an invoice, bill of lading, shipping
39 paper, or other documentation a declaration of all performance properties that qualifies the fuel as premium
40 diesel fuel as required in Section 2.2.1. Premium Diesel Fuel.

41 (Added 1998) (Amended 1999)

42 (Amended 1998, 1999, 2008, 2012, and 2018)

3.6. Fuel Oils.

3.6.1. Labeling of Grade Required. – Fuel Oil shall be identified by the grades contained in the latest version of ASTM D396, “Standard Specification for Fuel Oils.”
(Amended 2018)

3.6.2. Retail Fuel Oil. – Dispensers shall display the following legend:

“Warning – Not Suitable for Use in Unvented Heaters Requiring No. 1-K Kerosene.”

The lettering of this legend shall not be less than 12.7 mm (1/2 in) in height by 1.5 mm (1/16 in) strokes (width of type), block style letters, and the color of lettering shall be in definite contrast to the background color to which it is applied.

(Added 2018)

(Amended 2008 and 2018)

3.15. Biodiesel and Biodiesel Blends containing greater than 20 % by volume biodiesel.

3.15.1. Identification of Product. – Biodiesel Blendstock shall be identified by the term “biodiesel” with the designation “B100” or “B99.”
(Amended 2018)

3.15.2. Labeling of Retail Dispensers.

3.15.2.1. Labeling of Grade Required. – Biodiesel shall be identified by the grades No. 1-B S15, ~~or~~ No. 1-B S500, No. 2-B S15, or No. 2-B S500.
(Amended 2018)

3.15.2.2. Automotive Fuel Rating. – Fuels meeting the above requirements and/or including greater than 5 % renewable diesel ~~Biodiesel and biodiesel blends diesel~~ shall be labeled with its automotive fuel rating in accordance with the FTC Automotive Fuel Ratings, Certification and Posting Rule, 16 CFR 306.
(Amended 2018)

3.15.2.3. Biodiesel Blends. – When biodiesel blends greater than 20 % by volume are offered by sale, each side of the dispenser where fuel can be delivered shall have a label conspicuously placed that states “Consult Vehicle Manufacturer Fuel Recommendations.” The lettering of this legend shall not be less than 6 mm (1/4 in) in height by 0.8 mm (1/32 in) stroke; block style letters and the color shall be in definite contrast to the background color to which it is applied.

3.15.3. Documentation for Dispenser Labeling Purposes. – The retailer shall be provided, at the time of delivery of the fuel, a declaration of the volume percent biodiesel on an invoice, bill of lading, shipping paper, or other document. This documentation is for dispenser labeling purposes only; it is the responsibility of any potential blender to determine the amount of biodiesel in the diesel fuel prior to blending.

~~**3.15.4. Exemption.** – Biodiesel blends that contain less than or equal to 5 % biodiesel by volume are exempted from the requirements of Sections 3.15.1. Identification of Product, 3.15.2. Labeling of Retail Dispensers, and 3.15.3. Documentation for Dispenser Labeling Purposes when it is sold as “diesel fuel” as required in Section 3.3. Diesel Fuel.~~
(Added 2005) (Amended 2008 and 2018, and 20XX)

Section 4. Retail Storage Tanks and Dispenser Filters

4.1. Water in Gasoline-Alcohol Blends, Biodiesel Blends, Ethanol Flex Fuel, Aviation Gasoline, and Aviation Turbine Fuel. – No water phase greater than 6 mm (¼ in) as determined by an appropriate detection paste or other acceptable means, is allowed to accumulate in any tank utilized in the storage of gasoline-alcohol blend, biodiesel, biodiesel blends, ethanol flex fuel, aviation gasoline, and aviation turbine fuel.
(Amended 2008, 2012, and 2014)

4.2. Water in Gasoline, Diesel, Gasoline-Ether, and Other Fuels. – Water shall not exceed 25 mm (1 in) in depth when measured with water indicating paste or other acceptable means in any tank utilized in the storage of diesel, gasoline, gasoline-ether blends, and kerosene sold at retail except as required in Section 4.1. Water in Gasoline-Alcohol Blends, Biodiesel Blends, Ethanol Flex Fuel, Aviation Gasoline, and Aviation Turbine Fuel.
(Amended 2008, 2012, and 2014)

4.3. Dispenser Filters.

4.3.1. Engine Fuel Dispensers.

(a) All gasoline, gasoline-alcohol blends, gasoline-ether blends, ethanol flex fuel, and M85 methanol dispensers shall have a 10 micron or smaller nominal pore-sized filter.

(b) All biodiesel, biodiesel blends, diesel, and kerosene dispensers shall have a 30 micron or smaller nominal pore-sized filter.
(Amended 2014)

Previous Action:

2023: Assigned – Fuels and Lubricants Subcommittee

Original Justification:

The proposed changes provide additional clarity to changes made related to biodiesel approved at the 2022 annual meeting. The proposal also includes important information related to renewable diesel. The submitter recognizes that some may think no changes are needed.

Comments in Favor:

Regulatory:

- 2023 Interim: Ms. Vanessa Benchea, Vanessa Benchea, FALS Chair: FALS Agree with Mr. Corr and believes these items are fully developed and ready for a vote.
- 2023 Interim: Mr. Kevin Schnepf, California stated that California does not allow this technology, but he does support this item.

Industry:

- 2023 Interim: Mr. Chuck Corr, Chuck Corr Consulting representing Iowa Renewable Fuels Association recommended that item to be assigned to FALS, and he will lead a focus group to further develop it.
- 2023 Interim: Mr. Randy Jennings representing Clean Fuels Alliance American supported Chuck Corr's proposal.

1 **Advisory:**

- 2 • 2023 Annual: None

3
4 **Comments Against:**

5 **Regulatory:**

- 6 • 2023 Annual: None

7
8 **Industry:**

- 9 • 2023 Annual: None

10
11 **Advisory:**

- 12 • 2023 Annual: None

13
14 **Neutral Comments:**

15 **Regulatory:**

- 16 • 2023 Annual: None

17
18 **Industry:**

- 19 • 2023 Annual: Mr. Chuck Corr, (Corr Consulting) Informed the Committee that new information has
20 been submitted and is intended to replace the current item. He requested that the new information be
21 part of NCWM Publication 15 so the Regional Associations could review it and provide feedback.

22
23 **Advisory:**

- 24 • 2023 Annual: None

25
26 **Item Development:**

27 NCWM 2023 Interim Meeting: The Committee designated Assigned status to this block and assigned the items to the
28 FALS subcommittee.

29 For more information or to provide comment, please contact the FALS Chair:

30 Ms. Vanessa Benchea
31 Florida Department of Agriculture and Consumer Services/Division of Consumer Services
32 (813) 868-8263, Vanessa.Benchea@fdacs.gov

33 NCWM 2023 Annual Meeting: The Committee agreed to include Mr. Corr's new language in its Carry Over report
34 for consideration by the Regional Associations. It will also be published in NCWM Publication 15.

35 The new language follows the Regional Associations comments as they pertain to the previous version of the item.

Regional Associations' Comments:

WWMA 2022 Annual Meeting: Rebecca Richardson, Clean Fuels Alliance America, supports continued development of this item.

Mr. Kevin Schnepf of CDFA/DMS proposed several changes:

2.31.1. There are no current ASTM fuel quality standards for biodiesel, diesel blends greater than 20%. This section would imply that there is.

Deletion of 2.31.2.2 I do not see a need for this deletion.

Deletion of 2.31.4. Exemption. I do not see a need for this deletion. This section clarifies that biodiesel, diesel blends less than 5 % as considered diesel fuel.

Addition of 2.40.3 Labeling requirements: The FTC is covered in 2.31.2.2. If that section is deleted, then this requirement would be necessary.

B1: FLR-23.1

1.9. Biodiesel Blend. There are no current ASTM fuel quality standards for biodiesel, diesel blends greater than 20%. This section would imply that there is.

1.27 Fuel Oil. This is consistent with ASTM D396

1.XX Renewable Diesel. This is a weak definition that needs to be worked on.

3.3.2. Automotive Fuel Rating. – This is consistent with 16CRF306

3.15. Biodiesel and Biodiesel Blends containing greater than 20% by volume biodiesel. This is attempting to establish biodiesel blends greater than 20% by volume.

3.15.2.1. Labeling of Grade Required. This Fixes a miss B-2 S15 grade label.

3.15.2.2. Automotive Fuel Rating. This is the FTC requirement.

3.15.2.3. Biodiesel Blends. This section was not modified but I recommend that it be removed as there is no fuel quality standard for greater than 20% biodiesel, diesel blends.

3.15.4. Exemption. – This is consistent with 16CFR306

Based on testimony heard regarding this item not being fully developed, the WWMA L&R Committee recommends this item be assigned Developing status.

SWMA 2022 Annual Meeting: Mr. Randy Jennings (Clean Fuels) commented that he is generally in support of the items submitted and would like to see it go forward in some fashion. Speaking on his own behalf, he would like to suggest an amendment to the definition for diesel fuel to align with the recently updated ASTM D975.

Mr. Joe Sorena (Chevron) recommends the item remain in development and L&R consider alternate wording proposed concerning the concept of redefining the bio diesel blend containing greater than 20 %, as it is inconsistent with D7467 and will contribute to customer confusion.

Dr. Matthew Curran (Florida) commented he spoke with Chuck Corr regarding this item. Conceptually, approves this section. Inconsistencies were described found in the titles of MOS-23.1 and FLR-23.1 and a recommendation for clearer titles was made. He recommends in 2.31.2.1 verbiage is added to the specific EPA and FTC requirements.

Mr. Randy Jennings (Clean Fuels) suggested forming a focus group within FALS with Chuck Corr to lead and move this item forward.

The Committee corrected the title as follows:

B1: MOS-23.1 D Sections 2.231. Biodiesel and biodiesel Blends that Contain Greater Than or Equal to 21% by Volume Biodiesel. and 2.40. Diesel Fuel.

The Committee agrees that this item needs more development and recommends this as a Developing Item on the NCWM Agenda.

CWMA 2023 Annual Meeting: The CWMA recommended as an Assigned Item on the NCWM agenda.

Mr. Chuck Corr, Iowa Renewable Fuels Association, commented that the item is assigned to FALS which has formed a focus group that will make a presentation in July at the FALS meeting.

NEWMA 2023 Annual Meeting: Ms. Rebecca Richardson, Clean Fuels Alliance America offered an update on behalf of FALS stating that Chuck Corr, Chuck Corr Consulting, will have an update ready for the NCWM annual meeting in July. The NEWMA recommended as an Assigned Item on the NCWM agenda.

New Proposed Language Submitted:

B1:MOS-23.1

B. Uniform Regulation for the Method of Sale of Commodities

~~2.31. Biodiesel and Biodiesel Blends.~~

~~**2.31.1. Identification of Product.** Biodiesel shall be identified by the term "Biodiesel" with the designation "B100." Biodiesel Blends shall be identified by the term "Biodiesel Blend."~~

~~**2.31.2. Labeling of Retail Dispensers.**~~

~~**2.31.2.1. Labeling of Grade Required.** Biodiesel and biodiesel blends shall be identified in accordance with both EPA and FTC requirements.~~

~~**2.31.2.2. Automotive Fuel Rating.** Biodiesel and biodiesel blends shall be labeled with its automotive fuel rating in accordance with 16 CFR 306.~~

~~**2.31.2.3. Biodiesel Blends.** When biodiesel blends greater than 20 % by volume are offered by sale, each side of the dispenser where fuel can be delivered shall have a label conspicuously placed that states "Consult Vehicle Manufacturer Fuel Recommendations." The lettering of this legend shall not be less than 6 mm (¹/₄ in) in height by 0.8 mm (¹/₃₂ in) stroke; block style letters and the color shall be in definite contrast to the background color to which it is applied.~~

~~**2.31.3. Documentation for Dispenser Labeling Purposes.** The retailer shall be provided, at the time of delivery of the fuel, a declaration of the volume percent biodiesel on an invoice, bill of lading, shipping paper, or other document. This documentation is for dispenser labeling purposes only; it is the responsibility of any potential blender to determine the amount of biodiesel in the diesel fuel prior to blending.~~

~~2.31.4. Exemption. Biodiesel blends that contain less than or equal to 5 % biodiesel by volume are exempt from the requirements of Sections 2.31.1. Identification of Product, 2.31.2. Labeling of Retail Dispensers, and 2.31.3. Documentation for Dispenser Labeling Purposes when it is sold as diesel fuel.~~
(Added 2008) (Amended 2022)

2.40. Diesel Fuel. – Shall meet the following requirements, based on the biodiesel concentration of the fuel:

- (a) Diesel fuel that contains less than or equal to 5 % by volume biodiesel shall meet the latest version of ASTM D975, “Standard Specifications for Diesel Fuels” and shall be sold as diesel fuel.
- (b) Diesel fuel that contains **biodiesel in concentrations** greater than or equal to 6 % by volume ~~biodiesel~~ and ~~that contains~~ less than or equal to 20 % by volume shall meet the latest version of ASTM D7467, “Standard Specifications for Diesel Fuel Oil, Biodiesel Blend (B6 to B20).”
- (c) Diesel fuel that contains greater than or equal to 21 % by volume biodiesel shall be a blend of fuel from (a) or (b) and biodiesel meeting the latest version of ASTM D6751, “Standard Specification for Biodiesel Fuel Blend Stock (B100) for Middle Distillate Fuels.”
- (d) Only fuel additive registered with the U.S. EPA may be used to additize diesel fuel, and the final product shall meet the latest version of ASTM D975 and/or ASTM D7467.

2.40.1. Labeling of Retail Dispensers.

2.40.1.1. FTC Automotive Fuel Rating. – Diesel fuel shall be labeled with its automotive fuel rating in accordance with Automotive Fuel Ratings, Certification and Posting Rule 16 C.F.R. 306. Diesel fuel that contains less than or equal to 5 % by volume biodiesel and/or less than or equal to 5 % by volume biomass-based diesel does not require an FTC label.

2.40.1.2. Biodiesel Concentrations Greater than 21 % - When diesel fuel that contains biodiesel concentrations greater than or equal to 21 % by volume is offered by sale, each side of the dispenser where fuel can be delivered shall have a label conspicuously placed that states “Consult Vehicle Manufacturer Fuel Recommendations.” The lettering of this legend shall not be less than 6 mm (¹/₄ in) in height by 0.8 mm (¹/₃₂ in) stroke; block style letters and the color shall be in definite contrast to the background color to which it is applied.

2.40.1.3. Documentation for Dispenser Labeling Purposes. –The retailer shall be provided, at the time of delivery of the fuel, a declaration of the volume percent biodiesel and or volume percent of renewable diesel on an invoice, bill of lading, shipping paper, or other document. This documentation is for dispenser labeling purposes only; it is the responsibility of any potential blender to determine the amount of biodiesel in the diesel fuel prior to blending.

2.40.1.4. Delivery Documentation for Premium Diesel or Other Diesel Terminology Claims. – Before or at the time of delivery of the diesel fuel, the retailer or the wholesale purchaser-consumer shall be provided on an invoice, bill of lading, shipping paper, or other documentation a declaration of all performance properties that qualifies the fuel as premium diesel fuel as required in Section 2.40.2. Premium Diesel Fuel and 2.40.3. Use of Other Diesel Terminology.

(Added 20XX)

2.40.2. 2.40.1. Premium Diesel Fuel. – All diesel fuels identified on retail dispensers as premium, super, supreme, or premier must conform to the following minimum requirements.

- (a) **Cetane Number.** – A minimum cetane number of 47.0 as determined by the latest version of ASTM D613, “Standard Test Method for Cetane Number of Diesel Fuel Oil.”

NOTE: ASTM D613, “Standard Test Method for Cetane Number of Diesel Fuel Oil” is the referee method; however, the following methods can be used to determine cetane number: the latest version of ASTM D6890, “Standard Test Method for Determination of Ignition Delay and Derived Cetane Number” (DCN) of Diesel Fuel Oils by Combustion in a Constant Volume Chamber”; and ASTM D7668, “Standard Test Method for Determination of Derived Cetane Number (DCN) of Diesel Fuel Oils–Ignition Delay and Combustion Delay Using a Constant Volume Combustion Chamber Method.”

- (b) **Low Temperature Operability.** – A cold flow performance measurement which meets the latest version of ASTM D975, “Standard Specification for Diesel Fuel,” tenth percentile minimum ambient air temperature charts and maps by the latest version of either ASTM D2500, “Standard Test Method for Cloud Point of Petroleum Products and Liquid Fuels” or ASTM Standard D4539, “Standard Test Method for Filterability of Diesel Fuels by Low-Temperature Flow Test (LTFT).” The latest version of ASTM D6371, “Standard Test Method for Cold Filter Plugging Point of Diesel and Heating Fuels” may be used when the test results are a maximum of 6 °C below the Cloud Point. Low temperature operability is only applicable October 1 to March 31 of each year.

- (c) **Lubricity.** – A maximum wear scar diameter of 460 micrometers as determined by the latest version ASTM D6079, “Standard Test Method for Evaluating Lubricity of Diesel Fuels by the High-Frequency Reciprocating Rig (HFRR).”

NOTE: The latest version of ASTM D6079, “Standard Test Method for Evaluating Lubricity of Diesel Fuels by the High-Frequency Reciprocating Rig (HFRR)” is the referee method; however, the latest version of ASTM D7688, “Standard Test Method for Evaluating Lubricity of Diesel Fuels by the High-Frequency Reciprocating Rig (HFRR) by Visual Observation” can be used.

- (d) **Corrosion.** – A minimum rating of B+ as determined by the most recent version of NACE TM0172, “Determining Corrosive Properties of Cargoes in Petroleum Product Pipelines.”

NOTE: The latest recent version of NACE TM0172 “Determining Corrosive Properties of Cargoes in Petroleum Product Pipelines” is the referee method. The latest version of ASTM D7548 “Standard Test Method for Determination of Accelerated Iron Corrosion in Petroleum Products” can be used.

- (e) **Filter Blocking Tendency (FBT)** – A maximum of 2.2 by the latest version of ASTM D2068, “Standard Test Method for Determining Filter Blocking Tendency”, following procedure B.

- (f) **Injector Deposit Control.** – Maximum power loss in a keep-clean mode of 2 % by the latest version of Coordinating European Council, CEC F-98-08, “Direct Injection, Common Rail Diesel Engine Nozzle Coking Test.”

2.40.3. 2.40.2. Use of Other Diesel Terminology – For any terms other than premium, super, supreme, or premier included in the diesel fuel product or grade name and/or advertisements and claims displayed on dispensers, pump toppers, pole signs, and bollard signs which imply improved performance, the product must have a clearly-defined fuel property with a substantiated functional benefit. Such property must be measurable utilizing industry-accepted test methodologies developed by recognized standards organizations such as ASTM, SAE, and CEC to allow verification of the improved performance.

(Added 2021) (**Amended 20XX**)

B1:FLR-23.1

F. Uniform Fuels and Automotive Lubricants Regulation

Section 1. Definitions

1.8. Biodiesel. – A fuel comprised of at least 99 % by volume mono-alkyl esters of long chain fatty acids derived from vegetable oils or animal fats, designated B100 or B99.

(Amended 2018)

1.9. Biodiesel Blend – A fuel comprised of a homogeneous mixture of hydrocarbon oils and mono-alkyl esters of long-chain fatty acids. a blend of biodiesel with hydrocarbon diesel fuel.

(Amended 2018)

1.11. Cetane Number. – A numerical measure of the ignition performance of a diesel fuel obtained by comparing it to reference fuels in a standardized engine test.

1.15. Diesel Fuel – ~~A refined hydrocarbon suitable for use as a fuel in a compression ignition (diesel) internal combustion engine that may contain a combination of biodiesel, renewable diesel, and fuel additives.~~ A liquid fuel specifically designed for injection into a compression-ignition engine to provide energy, commonly composed of hydrocarbons refined from petroleum or biomass and the fuel may contain biodiesel and fuel additives.

(Amended 2018 and 20XX)

1.XX. Fuel Oil. – A liquid fuel designed for use in open flame applications to provide energy, commonly composed of hydrocarbons refined from petroleum or biomass and the fuel may contain biodiesel and fuel additives. The fuel may also be used in select compression-ignition engines.

1.XX. Biomass-based Diesel. - A hydrocarbon diesel fuel refined from biomass.

Section 2. Standard Specifications

2.2. Diesel Fuel. – Shall meet the following requirements, based on the biodiesel concentration of the fuel:

(a) Diesel fuel that contains less than or equal to 5 % by volume biodiesel shall meet the latest version of ASTM D975, “Standard Specifications for Diesel Fuels” and shall be sold as diesel fuel.

(b) Diesel fuel that contains biodiesel in concentrations greater than or equal to 6 % by volume ~~biodiesel~~ and ~~that contains~~ less than or equal to 20 % by volume shall meet the latest version of ASTM D7467, “Standard Specifications for Diesel Fuel Oil, Biodiesel Blend (B6 to B20).”

(c) Diesel fuel that contains greater than or equal to 21 % by volume biodiesel shall be a blend of fuel from (a) or (b) and biodiesel meeting the latest version of ASTM D6751, “Standard Specification for Biodiesel Fuel Blend Stock (B100) for Middle Distillate Fuels.”

(d) Only fuel additive registered with the U.S. EPA may be used to additize diesel fuel, ~~and the final product shall meet the latest version of ASTM D975 and/or ASTM D7467.~~

(Amended 2003, ~~and~~ 2018, and 20XX)

2.2.1. Premium Diesel Fuel. – All diesel fuels identified on retail dispensers as premium, super, supreme, or premier must conform to the following minimum requirements:

- (a) **Cetane Number.** – A minimum cetane number of 47.0 as determined by the latest version of ASTM D613, “Standard Test Method for Cetane Number of Diesel Fuel Oil.”

NOTE: ASTM D613, “Standard Test Method for Cetane Number of Diesel Fuel Oil” is the referee method; however, the following methods can be used to determine cetane number: the latest version of ASTM D6890, “Standard Test Method for Determination of Ignition Delay and Derived Cetane Number” (DCN) of Diesel Fuel Oils by Combustion in a Constant Volume Chamber”; and ASTM D7668, “Standard Test Method for Determination of Derived Cetane Number (DCN) of Diesel Fuel Oils–Ignition Delay and Combustion Delay Using a Constant Volume Combustion Chamber Method.”
(Note Added 2019)

- (b) **Low Temperature Operability.** – A cold flow performance measurement which meets the latest version of ASTM D975, “Standard Specification for Diesel Fuel,” tenth percentile minimum ambient air temperature charts and maps by the latest version of either ASTM D2500, “Standard Test Method for Cloud Point of Petroleum Products and Liquid Fuels” or ASTM D4539, “Standard Test Method for Filterability of Diesel Fuels by Low Temperature Flow Test, (LTFT).” The latest version of ASTM D6371, “Standard Test Method for Cold Filter Plugging Point of Diesel and Heating Fuels” may be used when the test results are a maximum of 6 °C below the Cloud Point. Low temperature operability is only applicable October 1 to March 31 of each year.

- (c) **Lubricity.** – A maximum wear scar diameter of 460 micrometers as determined by the latest version ASTM D6079, “Standard Test Method for Evaluating Lubricity of Diesel Fuels by the High-Frequency Reciprocating Rig (HFRR).”

NOTE: The latest version of ASTM D6079, “Standard Test Method for Evaluating Lubricity of Diesel Fuels by the High-Frequency Reciprocating Rig (HFRR)” is the referee method; however, the latest version of ASTM D7688, “Standard Test Method for Evaluating Lubricity of Diesel Fuels by the High-Frequency Reciprocating Rig (HFRR) by Visual Observation” can be used.
(Note Added 2019)

- (d) **Corrosion.** – A minimum rating of B+ as determined by the latest version of NACE TM0172, “Determining Corrosive Properties of Cargoes in Petroleum Product Pipelines.”

NOTE: The latest version of NACE TM0172 “Determining Corrosive Properties of Cargoes in Petroleum Product Pipelines” is the referee method. The latest version of ASTM D7548 “Standard Test Method for Determination of Accelerated Iron Corrosion in Petroleum Products” can be used.
(Added 2019)

- (e) **Filter Blocking Tendency (FBT).** – A maximum of 2.2 by the latest version of ASTM D2068, “Standard Test Method for Determining Filter Blocking Tendency”, following procedure B.
(Added 2019)

- (f) **Injector Deposit Control.** – Maximum power loss in a keep-clean mode of 2 % by the latest version of Coordinating European Council, CEC F-98-08, “Direct Injection, Common Rail Diesel Engine Nozzle Coking Test.”
(Added 2019)

2.2.2. Use of Other Diesel Terminology. – For any terms other than premium, super, supreme, or premier included in the diesel fuel product or grade name and/or advertisements and claims displayed on dispensers, pump toppers, pole signs, and bollard signs which imply improved performance, the product must have a clearly-defined fuel property with a substantiated functional benefit. Such property must be measurable utilizing industry

accepted test methodologies developed by recognized standards organizations such as ASTM, SAE, and CEC to allow verification of the improved performance.

(Added 2019)

(Amended 2003 and 2019)

2.5. Fuel Oils. –Shall meet the latest version of ASTM D396, “Standard Specification for Fuel Oils.”

2.17. Biodiesel Blendstock – Biodiesel intended for blending with diesel fuel shall meet the latest version of ASTM D6751, “Standard Specification for Biodiesel Fuel Blend Stock (B100) for Middle Distillate Fuels.” Any blend stock less than 99 % by volume biodiesel (no more than 1 % by volume diesel fuel). Any blend stock less than 99 % by volume shall not be used as a commercial blend stock for biodiesel blends without the permission of the Director.

(Added 2004) (Amended 2018)

Section 3. Classification and Labeling for Sale

3.1. General Considerations.

3.1.1. Documentation. –When products regulated by this rule are sold, an invoice, bill of lading, shipping paper, or other documentation must accompany each delivery other than a retail sale. This document must identify the quantity, the name of the product, the particular grade of the product, the applicable automotive fuel rating, and oxygenate type and content (if applicable), the name and address of the seller and buyer, and the date and time of the sale. Documentation must be retained at the retail establishment for a period not less than one year.

(Amended 2008)

3.1.2. Retail Dispenser Labeling. –All retail dispensing devices must identify conspicuously the type of product (exception: gasoline and gasoline-oxygenate blends), the particular grade of the product (exception: No. 2 Diesel), and the applicable automotive fuel rating.

(Amended 2018)

3.1.3. Grade Name. – The sale of any product under any grade name that indicates to the purchaser that it is of a certain automotive fuel rating or ASTM grade shall not be permitted unless the automotive fuel rating or grade indicated in the grade name is consistent with the value and meets the requirements of Section 2, Standard Specifications.

3.1.4. Nozzle Requirements for Automotive Gasoline, Gasoline-Oxygenate Blends, and Diesel Fuel Dispensers. –Each retail dispensing device from which fuel products are sold shall be equipped with a nozzle spout having a diameter that conforms with the latest version of SAE J285, “Dispenser Nozzle Spouts for Liquid Fuel Intended for Use with Spark-Ignition and Compression Ignition Engines.”

(Added 2018)

(Amended 2018)

3.3. Diesel Fuel.

3.3.1. Labeling of Retail Dispensers.

3.3.1.1. FTC Automotive Fuel Rating. – Diesel fuel shall be labeled with its automotive fuel rating in accordance with Automotive Fuel Ratings, Certification and Posting Rule 16 C.F.R. 306. Diesel fuel

that contains less than or equal to 5 % by volume biodiesel and/or less than or equal to 5 % by volume biomass-based diesel does not require an FTC label.

3.3.1.2. Biodiesel Concentrations Greater than 21 % – When diesel fuel that contains biodiesel concentrations greater than or equal to 21 % by volume is offered by sale, each side of the dispenser where fuel can be delivered shall have a label conspicuously placed that states “Consult Vehicle Manufacturer Fuel Recommendations.” The lettering of this legend shall not be less than 6 mm (1/4 in) in height by 0.8 mm (1/32 in) stroke; block style letters and the color shall be in definite contrast to the background color to which it is applied.

3.3.1.3. Labeling of Grade Required. – Diesel Fuel other than No 2-D shall be identified by grade. (Added 20XX)

3.3.2. Documentation for Dispenser Labeling Purposes.

3.3.2.1. The retailer shall be provided, at the time of delivery of the fuel, a declaration of the volume percent biodiesel and or volume percent of renewable diesel on an invoice, bill of lading, shipping paper, or other document. This documentation is for dispenser labeling purposes only; it is the responsibility of any potential blender to determine the amount of biodiesel in the diesel fuel prior to blending.

~~3.3.1. Labeling of Grade Required – Diesel Fuel other than No 2-D shall be identified by grade. (Amended 2018)~~

~~3.3.2. Automotive Fuel Rating. Diesel fuel containing 6 % to 20 % by volume biodiesel shall be labeled with its automotive fuel rating in accordance with the FTC “Automotive Fuel Ratings, Certification and Posting Rule,” 16 CFR 306. (Added 2018) (Amended 20XX)~~

3.3.2.2, 3.3.3. Delivery Documentation for Premium Diesel or Other Diesel Terminology Claims. – Before or at the time of delivery of the premium diesel fuel, the retailer or the wholesale purchaser-consumer shall be provided on an invoice, bill of lading, shipping paper, or other documentation a declaration of all performance properties that qualifies the fuel as premium diesel fuel as required in Section 2.2.1. Premium Diesel Fuel and 2.2.2 Use of Other Diesel Terminology. (Added 1998) (Amended 1999 and 20XX) (Amended 1998, 1999, 2008, 2012, and 2018, and 20XX)

3.6. Fuel Oils.

3.6.1. Labeling of Grade Required. –Fuel Oil shall be identified by the grades contained in the latest version of ASTM D396, “Standard Specification for Fuel Oils.”
(Amended 2018)

3.6.2. Retail Fuel Oil. –Dispensers shall display the following legend:

“Warning – Not Suitable for Use in Unvented Heaters Requiring No. 1-K Kerosene.”

The lettering of this legend shall not be less than 12.7 mm (1/2 in) in height by 1.5 mm (1/16 in) strokes (width of type), block style letters, and the color of lettering shall be in definite contrast to the background color to which it is applied.

(Added 2018)

(Amended 2008 and 2018)

3.15. Biodiesel and Biodiesel Blends

~~3.15.1. Identification of Product. Biodiesel Blendstock shall be identified by the term “biodiesel” with the designation “B100” or “B99.”~~

~~(Amended 2018)~~

~~3.15.2. Labeling of Retail Dispensers:~~

~~3.15.2.1. Labeling of Grade Required. Biodiesel shall be identified by the grades No. 1 B S15 or No. 1 B S500, or No. 2 B S500.~~

~~(Amended 2018)~~

~~3.15.2.2. Automotive Fuel Rating. Biodiesel and biodiesel blends shall be labeled with its automotive fuel rating in accordance with the FTC Automotive Fuel Ratings, Certification and Posting Rule, 16 CFR 306.~~

~~(Amended 2018)~~

~~3.15.2.3. Biodiesel Blends. When biodiesel blends greater than 20 % by volume are offered by sale, each side of the dispenser where fuel can be delivered shall have a label conspicuously placed that states “Consult Vehicle Manufacturer Fuel Recommendations.”~~

~~The lettering of this legend shall not be less than 6 mm (¹/₄ in) in height by 0.8 mm (¹/₃₂ in) stroke; block style letters and the color shall be in definite contrast to the background color to which it is applied.~~

~~3.15.3. Documentation for Dispenser Labeling Purposes. The retailer shall be provided, at the time of delivery of the fuel, a declaration of the volume percent biodiesel on an invoice, bill of lading, shipping paper, or other document. This documentation is for dispenser labeling purposes only; it is the responsibility of any potential blender to determine the amount of biodiesel in the diesel fuel prior to blending.~~

~~3.15.4. Exemption. Biodiesel blends that contain less than or equal to 5 % biodiesel by volume are exempted from the requirements of Sections 3.15.1. Identification of Product, 3.15.2. Labeling of Retail Dispensers, and 3.15.3. Documentation for Dispenser Labeling Purposes when it is sold as “diesel fuel” as required in Section 3.3. Diesel Fuel.~~

~~(Added 2005) (Amended 2008 and 2018)~~

Regional Associations’ Comments:

CWMA 2023 Interim Meeting: Chuck Corr, Iowa Renewable Fuels Association commented that this block was Assigned to FALS. The item has been updated, and the focus group will reconvene in November. He expects the final version by January 2024 and intends for the item to achieve Voting status. Mr. Corr further commented that this is found in Labeling of Retail Dispensers 2.40.1.3 L&R page 158, line 12, the word “renewable” should be replaced with “biomass-based”. Similarly, on Documentation for Dispenser Labeling Purposes 3.3.2.1 L&R page 162, line 32 the same correction should be made. This change is to keep the item consistent with Federal Trade Commission terminology.

The committee recommends this item remain assigned to FALS.

WWMA 2023 Annual Meeting: Randy Jennings, representing Clean Fuels Alliance America and FALS Vice Chair, supports this item moving forward, and has been working closely with Chuck Corr, submitter and the focus group.

Mr. Jennings stated that the FALS Subcommittee gave no dissent to this item and posed no opposition to this item moving forward in July.

Mr. Corr submitted the following updates by email to the L&R Committee:

“These two items were assigned to FALS at the last interim meeting. During the spring a focus group refined the proposal and presented it to all FALS members at the July national meeting. There was consensus to publish this version to get additional feedback from the fall regional meetings. The focus group will reconvene in November to consider the feedback received. We will then present it for full FALS review. We expect a final version at the January Interim Meeting and hope for a voting status.

During the development process the focus group received a number of comments that, where the FTC regulation is being implemented, we should use FTC terminology. The FTC regulations use the term biomass-based diesel. The intention was to replace renewable diesel with biomass-based diesel throughout the proposal. When preparing the final document, I made an error by not making the replacement in two locations. Please consider these two corrections:

- Page L&R 158 Line 12 replace the word “renewable” with “biomass-based”
- Page L&R 162 Line 32 replace the word “renewable” with “biomass-based”

Steven Harrington, State of Oregon stated that he was in support of the proposal and encourages Voting status, as it is working to match language in 16 CFR part 306.

Kurt Floren, County of Los Angeles, California expressed that Mr. Jennings is the premier expert on this topic. Mr. Floren also asked if there was a reason for the discrepancy between the 20% and 21% throughout the document. Mr. Jennings replied that when measuring these quantities, the general rules of rounding would be applied.

Kevin Schnepf, California Department of Food and Agriculture, Division of Measurement Standards stated that he understood that the discrepancies may be due to a rounding issue, however the gap between 20% and 21% may cause enforcement issues. Mr. Schnepf recommended this item remain assigned to FALS.

Joe Sorena, Chevron, Russ Lewis, Marathon Petroleum, and Bill Striejewski, Nevada all stood in support of this item moving forward with the amendments as stated.

The WWMA L&R Committee recommends this item remain assigned to FALS until the final report is given by FALS in January, when this item may be escalated to Voting status.

SWMA 2023 Annual Meeting: The following update was provided by Vanessa Benchea, State of Florida, FALS Chair:

These two items were assigned to FALS at the last interim meeting. During the spring, a focus group refined the proposal and presented it to all FALS members at the July national meeting. There was consensus to publish this version to get additional feedback from the fall regional meetings. This language can be found on page L & R 157 of the Agenda.

The focus group will reconvene in November to consider the feedback received. We will then present it for full FALS review.

We expect a final version at the January Interim Meeting and hope for a voting status.

During the development process the focus group received a number of comments that, where the FTC regulation is being implemented, we should use FTC terminology. The FTC regulations use the term biomass-based diesel. The intention was to replace renewable diesel with biomass-based diesel throughout the proposal. When preparing the

final document, an error was made by not making the replacement in two locations. Please consider these two corrections:

- Page L&R 158 Line 12 replace the word “renewable” with “biomass-based”
- Page L&R 162 Line 32 replace the word “renewable” with “biomass-based”

Apologies for this error.

Again, we are looking for feedback on the proposal. You can either contact Chuck at chuckcorrconsulting@gmail.com or any FALS member.

Randy Jennings representing Clean Fuels and Russ Lewis, Marathon, both made comments in support of this item and the changes suggested.

The SWMA L&R Committee recommends this item remain assigned to FALS until the final report is given by FALS in January, when this item may be escalated to Voting status.

NEWMA 2023 Interim Meeting: Jim Willis, NY - Finds the wording confusing (21% in the title vs. references to 20% in the language) in the proposal, questioning transparency of renewable fuels with threshold of 20% and 21%.

Walt Remmert, PA - Supports this as a ‘Voting’ item.

The committee recommends this as a developing 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.

ITEM BLOCK 2 (B2) REFERENCE ASTM STANDARDS D8080 AND D8487

B2: MOS-24.1 2.9. Liquefied Natural Gas (LNG) Vehicle Fuel., 2.10. Compressed Natural Gas (CNG)., and 2.XX. Compressed Natural Gas (CNG) Blended with Hydrogen

Source:
AMT Consulting

Purpose:
Amend NIST HB 130 B. Uniform Regulation for the Method of Sale of Commodities: sections 2.9 and 2.10 by replacing SAE J1616 and SAE J2699 with ASTM D8080 “Standard Specification for Compressed Natural Gas (CNG) and Liquefied Natural Gas (LNG) Used as a Motor Vehicle Fuel.”

Amend NIST HB 130 B. Uniform Regulation for the Method of Sale of Commodities, Section 2 by adding a new paragraph for ASTM D8487 “Standard Specification for Natural Gas, Hydrogen Blends for Use as a Motor Vehicle Fuel.”.

Amend NIST HB 130 F. Uniform Fuels and Automotive Lubricants Regulation sections 3.10 and 3.11 by adding labeling of grades to the method of sale for CNG and LNG.

Item under Consideration:
Amend the Uniform Fuels and Automotive Lubricants Regulation as follows:

2.9. Liquefied Natural Gas (LNG) Vehicle Fuel. – Shall meet the latest version of ~~SAE J2699, “Liquefied Natural Gas (LNG) Vehicle Fuel.”~~ ASTM D8080 “Standard Specification for Compressed Natural Gas (CNG) and Liquefied Natural Gas (LNG) Used as a Motor Vehicle Fuel.”

2.10. Compressed Natural Gas (CNG). – Shall meet the latest version of ~~SAE J1616, “Recommended Practice for Compressed Natural Gas Vehicle Fuel.”~~ ASTM D8080 “Standard Specification for Compressed Natural Gas (CNG) and Liquefied Natural Gas (LNG) Used as a Motor Vehicle Fuel.”

2.XX Compressed Natural Gas (CNG) blended with hydrogen. Shall meet the latest version of ASTM D8487 “Standard Specification for Natural Gas, Hydrogen Blends for Use as a Motor Vehicle Fuel.”

Previous Status:

New in 2024

B2: FLR-24.1 3.11.2.1.X. Identification of Grade. and 3.12.2.X. Identification of Grade.

Item under Consideration:

Amend the Uniform Fuels and Automotive Lubricants Regulation as follows:

3.11.2.1.4. Identification of Grade. – Each retail dispenser of CNG shall be labeled with an identification of the grade of the product.

3.12.2.2. Identification of Grade. – Each retail dispenser of LNG shall be labeled with an identification of the grade of the product.

Previous Status:

New in 2024

Original Justification:

ASTM Committee D03 on Gaseous Fuels has adopted two new fuel quality specifications for natural gas vehicles:

ASTM D8080 “Standard Specification for Compressed Natural Gas (CNG) and Liquefied Natural Gas (LNG) Used as a Motor Vehicle Fuel”

ASTM D8487 “Standard Specification for Natural Gas, Hydrogen Blends for Use as a Motor Vehicle Fuel”.

These specifications are a replacement for both SAE J1616 (CNG) and SAE J2699 (LNG).

ASTM D8080 is intended for natural gas vehicle fuels that have no additional hydrogen blend in the fuel. The specification establishes performance grades based on the fuel resistance to engine knock, energy content, and sulfur levels.

ASTM D8487 is intended for natural gas vehicle fuels that have additional hydrogen blended in the fuel. The specification covers natural gas fuels that have been blended with hydrogen and establishes performance grades based on the fuel resistance to engine knock, energy content, and sulfur levels. This specification is to be used in locations where hydrogen is being blended into the natural gas supply. This will become increasingly important as the natural gas supply has hydrogen blended to meet the decarbonization efforts of the US.

Both these standards are applicable at the point of dispensing into the vehicle fuel tank.

This proposal will require dispensers to be labeled with the product grade. This will require the product composition to be determined.

The submitter requested that the status be “Developing”.

Comments in Favor:

Regulatory:

-

Industry:

-

Advisory:

-

Comments Against:

Regulatory:

-

Industry:

-

Advisory:

-

Neutral Comments:

Regulatory:

-

Industry:

-

Advisory:

-

Item Development:

New Proposal

Regional Associations’ Comments:

New Proposal

CWMA 2023 Interim Meeting: No comments were heard.

The committee recommends this item be developing as requested by the submitter.

WWMA 2023 Annual Meeting: Kevin Schnepf, California Department of Food and Agriculture, Division of Measurement Standards stood in support of both items in Block 2. Mr. Schnepf stated that the ASTM standard that is specified in this item has been thoroughly vetted and is also a standard that accounts for hydrogen blending in natural gas, which is already adopted in Europe. Mr. Schnepf stated that these specifications meet the needs of industry and producers.

The WWMA L&R Committee recommends this item as Developing as requested by the submitter.

SWMA 2023 Annual Meeting: The SWMA L & R committee recommends this item as Developing as requested by the submitter. The committee would also like to alert NCWM that some items listed in Block 2 are referenced incorrectly to the Method of Sale of Commodities section and should reference the Fuels and Automotive Lubricants Regulation section and are listed below:

MOS-24.1 to FLR-24.#

Amend NIST HB 130 ~~B. Uniform Regulation for the Method of Sale of Commodities~~ **F. Uniform Fuels and Automotive Lubricants Regulation**: sections 2.9 and 2.10 by replacing SAE J1616 and SAE J2699 with ASTM D8080 “Standard Specification for Compressed Natural Gas (CNG) and Liquefied Natural Gas (LNG) Used as a Motor Vehicle Fuel.”

Amend NIST HB 130 ~~B. Uniform Regulation for the Method of Sale of Commodities~~ **F. Uniform Fuels and Automotive Lubricants Regulation**, Section 2 by adding a new paragraph for ASTM D8487 “Standard Specification for Natural Gas, Hydrogen Blends for Use as a Motor Vehicle Fuel.”.

B2: FLR-~~24.1~~ 3.11.2.1.X. Identification of Grade. and 3.12.2.X. Identification of Grade.

Item under Consideration:

Amend the ~~Uniform Regulation for the Method of Sale of Commodities~~ **Uniform Fuels and Automotive Lubricants Regulation** as follows:

3.11.2.1.X4. Identification of Grade. – Each retail dispenser of CNG shall be labeled with an identification of the grade of the product.

3.12.2.X4. Identification of Grade. – Each retail dispenser of LNG shall be labeled with an identification of the grade of the product.

NEWMA 2023 Interim Meeting: No comments were heard on this item.
The committee recommends this as a developing 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.

-
- 1
 - 2 Mr. Mike Brooks, Arizona | Committee Chair
 - 3 Mr. Tory Brewer, West Virginia | Vice-Chair
 - 4 Mr. Mauricio Mejia, Florida | Member
 - 5 Mr. Walter Remmert, Pennsylvania | Member
 - 6 Mr. Mike Harrington, Iowa | Member
 - 7 Mr. Brent Price, Gilbarco | AMC Representative
 - 8 Mr. John McGuire, NIST OWM | NIST Technical Advisor
 - 9 Ms. Lisa Warfield, NIST OWM | NIST Technical Advisor
 - 10 Mr. Rowan Hemsing, Measurement Canada | Canadian Technical Advisor
 - 11 Mr. Constantine Cotsoradis, NCWM | Committee Coordinator

Laws and Regulations Committee

Specifications and Tolerances (S&T) Committee 2024 Interim Meeting Agenda

Mr. Jason Flint, Committee Chair
New Jersey

INTRODUCTION

The S&T Committee will address the following items in Table A during the Interim Meeting. Table A identifies the agenda items by reference key, title of item, page number and the appendices by appendix designations. The headings and subjects apply to *Handbook 44 Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices, 2020 Edition*. The first three letters of an item's reference key are assigned from the Subject Series List. The next 2 digits represent the year the item was introduced. The acronyms for organizations and technical terms used throughout the agenda are identified in Table B. In some cases, background information will be provided for an item. The fact that an item appears on the agenda does not mean it will be presented to the National Conference on Weights and Measures (NCWM) for a vote. The Committee will review its agenda and may withdraw some items, present some items for information meant for additional study, issue interpretations, or make specific recommendations for change to the publications identified, which will be presented for a vote at the Annual Meeting. The Committee may also take up routine or miscellaneous items brought to its attention after the preparation of this document. The Committee may decide to accept items for discussion that are not listed in this document, providing they meet the criteria for exceptions as presented in *NCWM Policy 3.1.4. Handbooks, Procedures to Modify Handbooks*. The Committee has not determined whether the items presented will be Voting or Informational in nature; these determinations will result from their deliberations at the Interim Meeting.

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

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

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

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

Subject Series List

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
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
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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

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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	NTEP	National Type Evaluation Program
CNG	Compressed Natural Gas	OIML	International Organization of Legal Metrology
CWMA	Central Weights and Measures Association	OWM	Office of Weights and Measures
EPO	Examination Procedure Outline	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 Conference on Weights and Measures	WWMA	Western Weights and Measures Association

Details of All Items
(In order by Reference Key)

SCL – SCALES

SCL-24.1 S.1.7. Capacity Indication, Weight Ranges, and Unit Weights.

Source:

Rice Lake Weighing Systems

Purpose:

The term “Electronic computing scales” is not defined and makes S.1.7.(b). a confusing statement. The term should be struck and replaced with retail scale, ECR or POS if that is the intent.

Item under Consideration:

Amend Handbook 44 Scales Code as follows:

S.1.7. Capacity Indication, Weight Ranges, and Unit Weights.

(a) **Gross Capacity.** – An indicating or recording element shall not display nor record any values when the gross load (not counting the initial dead load that has been canceled by an initial zero-setting mechanism) is in excess of 105 % of scale capacity.

(b) **Capacity Indication.** – ~~Electronic computing scales~~ **Retail scales, POS, and ECR** *(excluding postal scales and weight classifiers)* shall neither display nor record a gross or net weight in excess of scale capacity plus 9 d.
[Nonretroactive as of January 1, 1993] (Amended in 20XX)

The total value of weight ranges and of unit weights in effect or in place at any time shall automatically be accounted for on the reading face and on any recorded representation.

This requirement does not apply to: (1) single-revolution dial scales, (2) multi-revolution dial scales not equipped with unit weights, (3) scales equipped with two or more weighbeams, nor (4) devices that indicate mathematically derived totalized values.

(Amended 1990, 1992, and 1995)

Previous Status:

2024: New Proposal

Original Justification:

All digital scales made today are electronic computing scales. They compute weight values for analog signal to digital signal. This is a confusing statement and should be amended for clarification.

The submitter requested Voting status for 2024.

Comments in Favor:

Regulatory:

•

Industry:

•

Advisory:

•

Comments Against:

Regulatory:

•

Industry:

•

Advisory:

•

Neutral Comments:

Regulatory:

•

Industry:

•

Advisory:

•

Item Development:

New Proposal

Regional Associations' Comments:

New Proposal

CWMA 2023 Interim Meeting: Greg VanderPlaats from Minnesota stated that the terms 'Retail Scale', ECR, and POS are not defined in NIST Handbook 44.

Steve Peter from Wisconsin agreed with Greg's Comments. He also suggested adding the word 'Price' to the term Electronic Computing Scales.

The committee recommends that this item is a developing item.

WWMA 2023 Annual Meeting: During the WWMA 2023 annual meeting the following comments were received:

Mr. Cory Hainy (Representing the SMA): The SMA has not had the opportunity to assess the item and will meet in November 2023.

Mr. Steve Harrington (Oregon Department of Agriculture, Weights and Measures Program): Expressed confusion regarding terms in the proposed language and questioned whether or not all computing scales are retail scales. He recommended Developing as a status of this item.

Mr. Kevin Schnepp (California, Division of Measurement Standards), Mr. Kurt Floren (Los Angeles County, California), and Ms. Wendy Hahn (Stanislaus County, California) echoed the confusion expressed by Mr. Harrington.

Mr. Kurt Floren (Los Angeles County, California): Commented that there is an existing definition for computing scales and this item may confuse these existing definitions. POS means “Point of Sale” not “Point of Sale System” and ECR means “Electronic Cash Register” which may not be interfaced with a weighing device. He would like more information from Rice Lake and/or SMA regarding this item. Agreed with Oregon on a Developmental status for this item.

During open hearings testimony was received that the SMA has not evaluated this proposal. Comments were heard supporting a developmental status as the item needs further clarification on the terms and definitions in the item. The WWMA S&T Committee recommends that this item be assigned a Developing status. This will allow the submitter the opportunity to address the comments heard during the open hearings. The committee also looks forward to comments from the SMA and NIST OWM regarding this item.

SWMA 2023 Annual Meeting: The committee heard no comments on this item during Open Hearings.

The committee does not agree that the term electronic computing scales is confusing, therefore, making this item unnecessary.

The committee recommends withdrawal of this item.

NEWMA 2023 Interim Meeting: The State of NY opposes this item as computing scales are clearly defined in the definitions and not all electronic retail scales are computing scales. The Commonwealth of Massachusetts recommends to withdraw this item. Upon consensus of the body, the Committee recommends this 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.

SCL-24.2 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 Scales Code and Appendix D, Definitions as follows:

Appendix D, Definitions:

tare mechanism. – A mechanism (including a tare bar) designed for determining or balancing out the weight of packaging material, containers, vehicles, or other materials that are not intended to be included in net weight determinations. A mechanism for setting the indication to zero when a load is on the load receptor, either without altering the weighing range for net loads (additive tare mechanism); or reducing the weighing range for net loads (subtractive tare mechanism). It may function as a non-automatic mechanism (load balanced by an operator), or a semi-automatic mechanism (load balanced automatically following a single manual command). [2.20] (Amended 20XX)

Add new definitions as follows:

preset tare mechanism. A mechanism for subtracting a numerical value, (representing a weight, that is introduced into the instrument and is intended to be applied to other weighings without determining individual tares) from a gross or net weight value and indicating the result of the calculation. The weighing range for net loads is reduced accordingly. “Introduced” includes procedures such as: keying in, recalling from a data storage device, or inserting via an interface. [2.20] (Added 20XX)

gross indication. The indication of a weighing instrument with no tare mechanism or preset tare mechanism in operation. [2.20] (Added 20XX)

gross load. (1) All materials placed on the load receptor exclusive of the load receptor itself, or (2) the combined commodity and tare materials placed on the load receptor. [2.20] (Added 20XX)

gross weight. A weight value assigned to the combination of commodity and tare in a commercial transaction. [2.20] (Added 20XX)

net indication. The indication of a weighing instrument with a tare mechanism or preset tare mechanism in operation. [2.20] (Added 20XX)

net load. All commodity materials placed on the load receptor. [2.20] (Added 20XX)

net weight. A weight value assigned to the commodity in a commercial transaction. [2.20] (Added 20XX)

tare indication. The indication of a tare weighing mechanism. [2.20] (Added 20XX)

tare weight. A weight value assigned to the tare in a commercial transaction. [2.20] (Added 20XX)

tare load. All tare materials placed on the load receptor. [2.20] (Added 20XX)

Scales Code Changes:

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.

(b) After zero setting the effect of zero deviation on the result of the weighing shall be not more than $\pm 0.25 e$.

[Nonretroactive as of January 1, 20XX] (Added 20XX)

- (c) ~~A digital indicating device shall either automatically maintain a “center-of-zero” condition to $\pm \frac{1}{4}$ scale division or less, or have an auxiliary or supplemental “center-of-zero” indicator that defines a zero-balance condition to $\pm \frac{1}{4}$ of a scale division or less. A “center-of-zero” indication may operate when zero is indicated for gross and/or net mode(s).~~ A digital indicating device shall have a “center-of-zero” indicator that indicates when the deviation from zero is not more than $\pm \frac{1}{4}$ verification scale division. A “center-of-zero” indication 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 indicating device or equipped with a zero-tracking mechanism.

[Nonretroactive as of January 1, 1993]

- (e) (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, ~~and~~ 2019, and 20XX)

...

S.1.2.1. Digital Indicating Scales, Units. – Except for postal scales, a digital-indicating scale shall indicate weight values using only a single unit of measure. Weight ~~values~~ indications shall be presented in a decimal format with the value of the scale division expressed as 1, 2, or 5, or a decimal multiple or submultiple of 1, 2, or 5.

The requirement that the value of the scale division be expressed only as 1, 2, or 5, or a decimal multiple or submultiple of only 1, 2, or 5 does not apply to net weights ~~indications and recorded representations~~ that are calculated from gross and tare weights (measured without use of a tare or preset tare mechanism) indications where the scale division of the gross weight is different from the scale division of the tare weight(s) on multi-interval or multiple range scales. For example, a multiple range or multi-interval scale may indicate and record tare weights in a lower weighing range (WR) or weighing segment (WS), gross weights in the higher weighing range or weighing segment, and calculated net weights as follows:

55 kg	Gross Weight (WR2 d = 5 kg)	10.05 lb	Gross Weight (WS2 d = 0.05 lb)
–	Tare Weight (WR1 d = 2 kg)	–	Tare Weight (WS1 d = 0.02 lb)
<u>4 kg</u>		<u>0.06 lb</u>	
=	Net Weight (Mathematically	=	Net Weight (Mathematically
51 kg	Correct)	9.99 lb	Correct)

[Nonretroactive as of January 1, 1989]

(Added 1987) (Amended 2008 and 20XX)

...

S.1.7. Capacity Indication, Weight Ranges, and Unit Weights.

- (a) **Gross Capacity.** – An indicating or recording element shall not display any values nor record any values when the gross load (not counting the initial dead load that has been canceled by an initial zero-setting mechanism) is in excess of 105 % of scale capacity.

- (b) **Capacity Indication.** – ~~Electronic computing scales (excluding postal scales and weight classifiers) shall neither display nor record a gross or net weight values not display any values nor record any values when the gross load (not counting the initial dead load that has been canceled by an initial zero-setting mechanism) is~~ Electronic computing scales (excluding postal scales and weight classifiers) shall neither display nor record a gross or net weight values not display any values nor record any values when the gross load (not counting the initial dead load that has been canceled by an initial zero-setting mechanism) is in excess of scale capacity plus 9 d.

[Nonretroactive as of January 1, 1993]

The total value of weight ranges and of unit weights in effect or in place at any time shall automatically be accounted for on the reading face and on any recorded representation.

This requirement does not apply to: (1) single-revolution dial scales, (2) multi-revolution dial scales not equipped with unit weights, (3) scales equipped with two or more weighbeams, nor (4) devices that indicate mathematically derived totalized values.

(Amended 1990, 1992, ~~and~~ 1995, and 20XX)

...

S.2.3. Tare Mechanism and Preset Tare Mechanism, General. – *On any scale (except a monorail scale equipped with digital indications and multi-interval scales or multiple range scales when the ~~value of~~ tare weight is determined in a lower weighing range or weighing segment), the value of the tare division shall be equal to the value of the scale division.* The tare mechanism or the preset tare mechanism shall operate only in a backward direction (that is, in a direction of underregistration) with respect to the zero-load balance condition of the scale. A device designed to automatically clear any tare value shall also be designed to prevent the automatic clearing of tare until a complete transaction has been indicated. **

*[*Nonretroactive as of January 1, 1983]*

(Amended 1985, ~~and~~ 2008, and 20XX)

Note: *On a computing scale, this requires the input of a unit price, the display of the unit price, and a computed positive total price at a readable equilibrium. Other devices require a complete weighing operation, including tare, net, and gross weight determination.**

*[*Nonretroactive as of January 1, 1983]*

S.2.3.1. Tare Mechanism. – A tare mechanism shall permit setting the indication to zero accurate to $\pm 0.25 e$. On a multi-interval device e shall be replaced by e_1 .

(Added 20XX) (Nonretroactive as of January 1, 20XX)

S.2.3.2. Preset Tare Mechanism. – Regardless of how a preset tare value is introduced, its scale division shall be equal to or automatically rounded to the scale division of the device. On a multiple range device, a preset tare value may only be transferred from one weighing range to another one with a larger verification scale division but shall then be rounded to the latter. For a multi-interval device, the preset tare value shall be rounded to the smallest verification scale division, e_1 , of the device, and the maximum preset tare value shall not be greater than Max_1 . The displayed or printed calculated net value shall be rounded to the scale interval of the device for the same net weight value.

(Added 20XX) (Nonretroactive as of January 1, 20XX)

...

1 **S.1.15. Marking of Weight Indications.**

2 **(a) A single display used only for gross indications need not be designated. The display may be designated**
3 **by the term “gross.”**

4 **(b) A single display used for both gross and net values shall be designated “net” when displaying the net**
5 **value while a tare mechanism or preset tare mechanism is in operation. The display may be designated**
6 **“gross” when no tare mechanism is in operation, or when the gross weight is temporarily indicated while**
7 **a tare mechanism is in operation.**

8 **(c) If an instrument simultaneously displays two or more of the net, gross, or tare indications, each display**
9 **shall be designated by the appropriate term “net,” “gross,” or “tare.”**

10 **(d) However, it is permitted to replace the terms net, gross, and tare with the appropriate designations**
11 **“N” for net, “G” for gross and “T” for tare displayed to the right of the weight values, e.g., 4.48 lb N, 4.52**
12 **lb G, or 0.04 lb T.**

13 **(Added 20XX) (Nonretroactive as of January 1, 20XX)**

14 **S.1.16. Printing of Weighing Results.**

15 **(a) Gross weights may be printed without any designation. For a designation by the symbol, only “G” is**
16 **permitted.**

17 **(b) If only net weight is printed without corresponding gross or tare values, it may be printed without any**
18 **designation. A symbol for designation shall be “N”.**

19 **(c) Gross, net, or tare weights determined by a multiple range instrument or by a multi-interval instrument**
20 **need not be marked by a special designation referring to the (partial) weighing range. (see also S.1.2.1.)**

21 **(d) If net weights are printed together with the corresponding gross and/or tare weights, the net and tare**
22 **weights shall at least be identified by the corresponding symbols “N” and “T”. If the gross weight is**
23 **identified, the symbol “G” shall be used.**

24 **(e) However, it is permitted to replace “G”, “N” and “T” by complete words in English.**

25 **(Added 20XX) (Nonretroactive as of January 1, 20XX)**

26 **S.1.17. Mathematical Agreement of Net, Gross and Tare Values. When a device simultaneously indicates**
27 **(or records) net, gross and tare indications, the values shall be in mathematical agreement based on the**
28 **formula Net Weight = Gross Weight – Tare Weight whenever one of the three values is calculated from**
29 **two measured weight values, e.g., calculated Net = weighed Gross – weighed Tare. Mathematical agreement**
30 **is not required due to potential rounding errors when all three values are independently measured. (Added**
31 **20XX) (Nonretroactive as of January 1, 20XX)**

32 **Alternative proposal.**

33 **S.1.17. Mathematical Agreement of Net, Gross and Tare Values. When a device simultaneously indicates (or**
34 **records) net, gross and tare indications, the values shall be in mathematical agreement based on the formula**
35 **Net Weight = Gross Weight – Tare Weight, whenever one of the three values is calculated from two measured**
36 **weight values, e.g., calculated Net = weighed Gross – weighed Tare. This also applies to calculated net weights**
37 **when a preset tare mechanism is in operation. Mathematical agreement is not required due to potential**

rounding errors when a tare mechanism is in operation, as all three values are independently measured.
(Added 20XX) (Nonretroactive as of January 1, 20XX)

...

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 1) errors in gross indications (starting at gross load zero), 2) errors in net indications (starting at net load zero) when a tare mechanism is in operation, 3) errors in tare indications on a dedicated tare display when a tare mechanism is in operation, and 4) errors in net indications on a dynamic monorail scale (using a preset tare mechanism). Tolerances do not apply to errors in net indications for scales other than on dynamic monorail scales, when a preset tare mechanism is in operation.

(Amended 2008 and 20XX)

Previous Status:

2024: New Proposal

Original Justification:

This proposal recommends changes to the Scales Code to address:

(1) issues of poor terminology that lead to confusion in discussion of net weight (and tare) issues, and
(2) absence of specifics in the regulation of net weight that leads to ambiguity in enforcement.

Both of these issues emerged from discussions of the e vs d issues by the Verification Scale Division e Task Group. The Task Group however, decided both were outside the scope of its charge.

Issue 1. – The terminology relating to net weight and tare in the HB44 Scales Code is confusing since the three main terms (net, gross, and tare) may each be used to mean three different things. For example, the term “net” can refer to 1) the weight value on which a commercial transaction is based, 2) the mode of indication of an instrument, or 3) the load placed on the load receptor.

A good example is the use of the common expression “net equals gross minus tare.” primarily this is a formula describing the loading of the instrument in the weighing procedure.

Net load	=	Gross load	-	Tare	load
Commodity	=	Commodity + Tare	-	Tare	

What about the instrument indication? In the terminology of the instrument, a gross indication is the instrument indication when the weighing begins at a no-load zero indication. In the case of a scale with no tare mechanism we find:

Net weight	=	Gross indication	-	Gross	indication
Net load	=	Gross load	-	Tare	load
Commodity	=	Commodity + Tare	-	Tare	

With a tare mechanism or a keyboard tare mechanism, the instrument scale is set to net zero corresponding to the tare load. The Net indication is zero. We find:

1	<u>Net weight</u>	=	<u>Net indication</u>	-	<u>(Tare indication is zero)</u>
2	<u>Net load</u>	=	<u>Gross</u>		<u>load</u>
3	<u>Commodity</u>	=	<u>Commodity + Tare</u>		

4 The objective of any weighing process is to find the net weight, which might be assigned from one or more
5 instrument indications with different loads on the load receptor and different methods of operating the
6 instrument. We work with these terms every day, but we ignore or struggle with the inherent confusion.
7 Good regulations avoid this kind of confusion using clear terminology.

8 Issue 2. – There are only a few specifications governing tare operations in the Scales Code. I am not
9 including user requirements that don't apply to the instrument. A word search of the terms "tare" and
10 "net weight" point us to only six Specifications, one Note, and one Tolerance as in the table below.

<u>Section</u>	<u>Subject</u>	<u># Requirements</u>
<u>S.1.2.1.</u>	<u>Weight Units</u>	<u>2</u>
<u>S.1.7.</u>	<u>Manual Weight Entries</u>	<u>1</u>
<u>S.1.8.</u>	<u>Recording Net Weight POS Scales</u>	<u>2</u>
<u>S.1.12.</u>	<u>Manual Weight</u>	<u>1</u>
<u>S.2.1.6.</u>	<u>Combined Zero/Tare</u>	<u>1</u>
<u>S.2.3.</u>	<u>Tare</u>	<u>2</u>
<u>S.2.3.1.</u>	<u>Tare Digital Monorail Scales</u>	<u>2</u>
<u>N.1.12.</u>	<u>Strain Load Tests</u>	<u>N/A</u>
<u>T.N.2.1.</u>	<u>Tolerance Application to Net Weight</u>	<u>N/A</u>

11 The number of requirements is an assessment of the number of requirements requiring a distinct test to
12 verify compliance. In total, there are 11 tests required to verify the literal requirements in the Code. Yet
13 the NTEP checklist for an electronic scale has pages of tests governing tare operations. I concede that many
14 of those can also be derived from General Code requirements, but general also comes with a lack of
15 specificity. This is no suggestion that Pub 14 is wrong in any way. There has always been this challenge to
16 ensure NTEP is following HB44, and not the other way around. There is another challenge to not over-
17 regulate. It is generally better to have fewer, but clearer, requirements.

18 If you believe the current Code is sufficiently unambiguous, try to answer the following questions using
19 only the text in HB44? No peeking in Pub 14.

- 20 1. What is meant in T.N.2.1. by "the net weight indication of any possible tare load using certified test
21 weights." If you ask different people, you might get many different answers.
- 22 2. Can you point to any guidance in the Notes section to help answer question 1 or conduct the test in order
23 to apply the tolerances?
- 24 3. Must keyboard tare, pre-programmed tare, and pushbutton tare all result in the same net weight?
25 If you say yes, on what code requirement do you base your decision? Different weighing procedures can
26 produce different results by one scale division.

4. If the instrument simultaneously indicates the Net, Gross, and Tare weights (or prints them), do the values have to be in mathematical agreement? If you say yes, on what code requirement do you base your decision? Under some circumstances mathematical agreement cannot be mandated due to rounding issues.
5. If an instrument has a dedicated tare weight display, do tolerances apply to that indication?
6. If an instrument records multiple values, e.g., net weight, gross weight, and tare weight, how must the values be identified either on the display or the printed record?

These are just a few questions to highlight a lack of clarity in the current Code. The proposal is intended to help resolve these issues.

Regarding the Proposed Definitions:

Justification: The current definition of tare mechanism does not differentiate between tare alternatives, like pushbutton tare, or keyboard and programmed tare. The amended definition of tare mechanism and the new definition of preset tare mechanism ensure clarity, particularly as they operate differently, and the tolerances should be applied when a tare mechanism is in operation but not when a preset tare mechanism is in operation. (See Revision to T.N.2.1.)

The new definitions relating to net, gross, and tare help clarify that these terms have multiple meanings. By using “loads” for the loading of the instrument, “indications” for the instrument indications, and “weights” for the transaction record, we can keep the meanings specific to the intent. Some key points:

- Weights may be assigned by the operator or by the instrument. Examples: 1) A gross indication when the commodity is the only load on the load receptor is designated the net weight by the operator. 2) A weigh-in/weigh-out system employs two gross indications that are used to calculate a net weight. If the operator calculates the net weight, the operator is also responsible to identify the respective net, gross and tare weights. If the instrument calculates the net weight, it must identify the respective net, gross, and tare weights.
- Requirements applicable to indications are also applicable to recorded representations (values printed or transmitted by the instrument) as per G-S.5.6. Note that some code requirements emphasize the recorded representations (redundantly), and some do not. This does not apply to actions of an operator such as manually computing net values from two measured weight values for gross and tare.
- The term “gross load” unavoidably has two meanings, but this is acceptable since the operator (or the official) clearly knows which applies based on how the scale is used. Example 1: a candy store may have a scoop that is sometimes used in the weighing operation. For the purposes of S.1.7. Capacity Indications, the scoop is part of the gross load placed on the load receptor and the weighing range of the scale is reduced by the scoop weight. However, for the purposes of the transaction, the scoop becomes part of the load receptor after a zero operation and is not part of the gross load (commodity and tare). A possible exception is the scale with a combined zero/tare key. However, these are not permitted in direct sale and the net weighing essentially begins at gross zero that is accurate to at least $\frac{1}{4}$ e. Example 2: if the commodity alone is placed on the load receptor, it is a gross load (by the first meaning) and a net load. This is the case when candy in the scoop is weighed for the transaction after including the scoop in the gross zero as in example 1. The net load is introduced into the packaging (tare) after the weighing operation. Example 3: if the tare alone is placed on the load receptor it is thus a gross load (by the first meaning) and a tare load. However, there are nuances to the meaning of tare load (next bullet).

- The term “tare load” is used only once in the current Scales Code in T.N.2.1. The proposed revision to that section would remove it. In practice, a tare load results in either a non-zero gross indication, or a zero net indication. Both are consistent with the new definitions of gross and net loads. There is also the possibility that a tare weighing mechanism is in use that displays or prints the tare weight. However, the value displayed on the tare weighing mechanism does not necessarily correspond to the current loading, since the tare weighing mechanism will remain at the tare indication when either the tare is removed from or the gross load (commodity and tare) are placed on the load receptor.
- The term “tare indication” is necessary as tolerances are applicable to a dedicated tare display in the revised T.N.2.1.

To further help explain the terminology, consider four basic weighing procedures. Instrument in all examples is Class III Max 30 lb d = 0.01 lb (Net, gross and tare descriptors in parentheses are optional as per proposed S.1.15.)

1. Direct Weighing

<u>Procedure Step</u>	<u>Loading</u>	<u>Internal Value</u>	<u>Indication</u>	<u>Weight (Transaction)</u>
<u>1 zero</u>	<u>No</u>	<u>0.000 lb</u>	<u>(Gross) 0.00 lb</u>	
<u>2 weigh</u>	<u>Net</u>	<u>4.283 lb</u>	<u>(Gross) 4.28 lb</u>	<u>(Net) 4.28 lb</u>

2. Difference Weighing

<u>Procedure Step</u>	<u>Loading</u>	<u>Internal Value</u>	<u>Indication</u>	<u>Weight (Transaction)</u>
<u>1 zero</u>	<u>No</u>	<u>0.000 lb</u>	<u>(Gross) 0.00 lb</u>	
<u>2 weigh*</u>	<u>Tare</u>	<u>0.034 lb</u>	<u>(Gross) 0.03 lb</u>	<u>Tare 0.03 lb</u>
<u>3 zero</u>	<u>No</u>	<u>0.000 lb</u>	<u>(Gross) 0.00 lb</u>	
<u>4 weigh*</u>	<u>Gross</u>	<u>4.317 lb</u>	<u>(Gross) 4.32 lb</u>	<u>(Gross) 4.32 lb</u>
<u>5 calculate</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>Net 4.29 lb</u>

* Steps 2 and 4 may be reversed, weighing gross in step 2 and tare in step 4.

3. Weighing using Tare Mechanism

<u>Procedure Step</u>	<u>Loading</u>	<u>Internal Value</u>	<u>Indication</u>	<u>Weight (Transaction)</u>
<u>1 zero</u>	<u>No</u>	<u>0.000 lb</u>	<u>(Gross) 0.00 lb</u>	
<u>2 weigh</u>	<u>Tare</u>	<u>0.034 lb</u>	<u>(Gross) 0.03 lb</u>	
<u>3 tare key</u>	<u>Tare</u>	<u>0.000 lb</u>	<u>Net 0.00 lb</u>	
<u>4 weigh</u>	<u>Gross</u>	<u>4.283 lb</u>	<u>Net 4.28 lb</u>	<u>(Net) 4.28 lb</u>

4. Weighing using Preset Tare Mechanism – Option (a)

<u>Procedure Step</u>	<u>Loading</u>	<u>Internal Value</u>	<u>Indication</u>	<u>Weight (Transaction)</u>
<u>1 zero</u>	<u>No</u>	<u>0.000 lb</u>	<u>(Gross) 0.00 lb</u>	
<u>2 enter tare</u>	<u>No</u>		<u>0.03 lb</u>	
<u>3 tare key</u>	<u>No</u>	<u>0.000 lb</u>	<u>Net -0.03 lb</u>	
<u>4 weigh</u>	<u>Gross</u>	<u>4.317 lb</u>	<u>Net 4.29 lb</u>	<u>(Net) 4.29 lb</u>

4. Weighing using Preset Tare Mechanism – Option (b)

<u>Procedure Step</u>	<u>Loading</u>	<u>Internal Value</u>	<u>Indication</u>	<u>Weight (Transaction)</u>
<u>1 zero</u>	<u>No</u>	<u>0.000 lb</u>	<u>(Gross) 0.00 lb</u>	
<u>2 weigh</u>	<u>Gross</u>	<u>4.317 lb</u>	<u>(Gross) 4.32 lb</u>	
<u>3 enter PLU</u>	<u>Gross</u>	<u>4.32 – 0.03</u>	<u>Net 4.29 lb</u>	<u>(Net) 4.29 lb</u>

In the above examples, you can read any row with a transaction weight to describe the weighing process for most cases. The exception is procedure 2 step 5 which is a calculation.

Procedure 1 step 2 reads: net weight = gross indication of the net load.

Procedure 2 step 2 reads: tare weight = gross indication of the tare load.

Procedure 2 step 4 reads: gross weight = gross indication of the gross load.

Procedure 3 step 4 reads: net weight = net indication of the gross load.

Regarding S.1.1.1. Digital Indicating Elements.

Justification: The changes mirror those proposed by the Verification Scale Division e Task Group. The current Code has no requirement on the accuracy of zero setting. The new part (b) ensures that zero setting is accurate within $\frac{1}{4}e$. The amendments to (c) are further explained in the reports of the Task Group and are not relevant to this proposal. The proposed (b) is nonretroactive since it is a major change.

Regarding S.1.2.1. Digital Indicating Scales, Units.

Justification: In the current text it may be unclear that the second paragraph and the examples address multi-interval and multiple range scales weighing by difference, i.e., using two measured gross indications with no tare or preset tare in operation. The changes make this clear. Using the terminology of weights, indications and loads, the 1, 2 or 5 requirement for the scale division applies to 1) the gross indications for the gross and tare loads, and 2) the gross and tare weights recorded for the transaction. The 1, 2, or 5 requirement does not apply to the calculated net weight, which may be displayed and/or printed. More on the mathematical agreement issue can be found in proposed S.1.17. below. As this is only a clarification, it does not alter the nonretroactive status of the section.

This section does not apply to tare operations using tare or preset tare mechanisms. If either a tare mechanism or a preset tare mechanism is in operation, then the net weights in the examples would necessarily be displayed and printed as 50 kg ($d = 5$ kg) and 10.00 lb ($d = 0.05$ lb) respectively. Both would be rounded by the device to the d of the upper weighing range before being displayed. It seems highly unlikely that any multi-interval scale would print all three values, if equipped with a tare or preset tare mechanism.

Regarding S.1.7. Capacity Indication, Weights Ranges, and Unit Weights.

Justification: Notice in (a) the current requirement refers to values, but in (b) it refers to weights. This is an instance of multiple meanings colliding in the current Code. The changes are a clean-up since the section uses the terms net, gross and tare. The intent of this section is that no gross or net “indications” are displayed or printed when the “gross load” (meaning all materials exclusive of dead load) exceeds some limit above scale capacity. The current wording in (b) is incorrect since it appears that the net values could also reach capacity plus $9d$ even with maximum tare. This doubles the scale capacity and is clearly not the intent of the section. NTEP has always applied this to mean no gross or net indications are permitted when the gross load (all materials other than dead load) exceeds capacity plus $9d$. As this is only a clarification of the original intent, it does not alter the nonretroactive status of the section.

Regarding S.2.3. Tare Mechanism and Preset Tare Mechanism, General.

Justification: The changes to S.2.3. are a cleanup of language consistent with the terms tare mechanism and preset tare mechanism. This backward application of tare has consistently been applied to both tare and preset tare in the past. As this is only a clarification, it does not alter the retroactive status of the affected section.

The new specifications, S.2.3.1. and S.2.3.2., clarify the difference between the two kinds of tare mechanisms. Because these changes may be significant, they are proposed to be nonretroactive. With a tare mechanism, the net zero setting is required to be accurate to $\frac{1}{4}e$, parallel to the setting of gross zero in S.1.1.1.(b). With a preset tare mechanism, the net zero value is rounded off to the scale division d . This

means net weights are simple calculations of rounded gross weight minus rounded tare weight. For more explanation see justification for changes to T.N.2.1. below.

For a multi-interval scale this means having full access to the entire lower weighing range in net mode. Consider a 0 - 15 lb x 0.005 lb and 15-30 lb x 0.01 lb multi-interval scale. If the tare is 14 lb, the lower weighing range for net weights will coincide with gross loads between 14 lb to 29 lb. The upper range for net weights will coincide with gross loads between 29 lb to 30 lb. Notice also that a maximum preset tare on a multi-interval scale is limited to the Max of the lower weighing range.

Regarding S.1.15. Marking of Weight Indications and S.1.16. Printing of Weighing Results.

Justification: These new sections provide clear specifications for net weight and the use of tare mechanisms. Because these changes may be significant, they are proposed as nonretroactive. Without these sections, the decisions regarding appropriate markings are arbitrary. Note that NTEP relies heavily on G-S.6. (marking of controls and indications), but Pub 14 has no legal standing. What is clear to one person may not be clear to another when viewing the Scales Code. In S.1.15. the specifications governing marking of the weight displays are added. In S.1.16. the specifications governing printed records are added. This section comes largely from R76 section 4.6.11.

Regarding S.1.17. Mathematical Agreement of Net, Gross and Tare Values.

Justification: Neither the Scales Code nor the General Code clearly addresses mathematical agreement of net, gross, and tare. Mathematical agreement is not an issue for most scales since they only display one or two of the net, gross and tare values. Instruments that display all three values are rare and will now be formally addressed in the Code to prevent confusion. The proposed sections make it clear that values calculated from two measured values must be in mathematical agreement. This is partially explained in the current S.1.2.1. With a preset tare mechanism, only the gross and tare weights are measured, while the net weight is calculated.

With a tare mechanism, the gross and tare weights are measured from gross zero and the net weight is measured from net zero. Mathematical agreement cannot be guaranteed in cases where the instrument measures all three values, since rounding errors may result in disagreement by +1 division 12.5% of the time and -1 division 12.5% of the time. Forcing mathematical agreement would require the manufacturer to fudge the results. Consider the following case:

<u>Load</u>	<u>Internal Value</u>	<u>Rounded Value</u>	
Gross	4.317 lb	4.32	lb
Tare	0.034 lb	0.03	lb
Net	4.283 lb	4.28 lb	(No agreement as $G - T = 4.29$ lb)

In this case the gross weight is rounded up and the tare weight is rounded down, resulting in a measured net weight 0.01 lb (1 d) smaller than the calculated net value. Similarly, if the gross weight is rounded up and the tare weight rounded down, the measured net weight is 0.01 lb (1 d) greater than the calculated net weight. Because these changes may be significant, they are proposed as nonretroactive.

There is a disconnect between mathematical agreement and tolerance application to net weight. If the net weight is calculated from measured gross and net weights, then mathematical agreement is required but tolerance is not applied to net weight. If the net, gross and tare weights are all measured, then mathematical agreement is not required but tolerance is applied to the net weight value. See proposed changes to T.N.2.1.

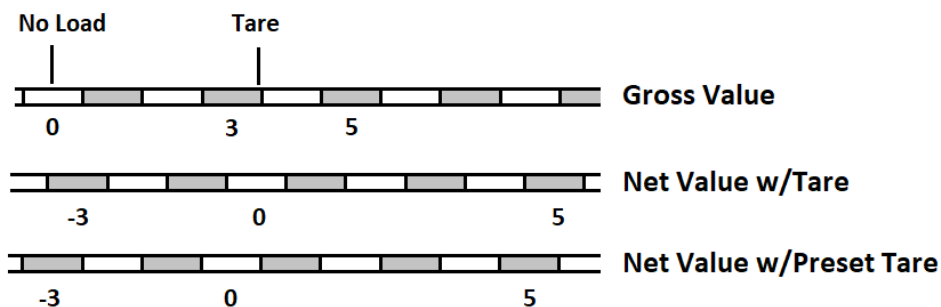
Regarding T.N.2.1. General.

Justification: The changes are clarifications and thus do not affect retroactivity. The addition of language applying the tolerances to errors of overregistration and underregistration insures uniform application of the signs. An instrument with a + error of overregistration also has a – error in deficiency. We should be consistent with G-T.3, and all report errors the same way. The tradition is to apply tolerances to errors of over/underregistration. The last part of the first sentence is deleted since the test may begin at other than zero at no load. For example, tolerance may be applied to net values that begin at zero at tare load with a tare mechanism in operation.

The new text spells out four instances where tolerances are applied. This includes:

1. **Errors in gross indications, beginning at gross load zero. – This has always been the case. These weighings begin at dead load zero. Note that the zero setting is covered by proposed S.1.1.1.(b) which requires setting zero accurate to $\frac{1}{4} e$.**
2. **Errors in net indications, beginning at net load zero when using a tare mechanism. – This also has traditionally been the practice even in the Scales Code pre-1984. This net zero setting is also accurate to $\frac{1}{4} e$ per proposed S.1.1.1.(b). The current wording is ambiguous.**
3. **Errors in Tare indications displayed on a dedicated tare weighing mechanism when a tare mechanism is in operation. – A good example is a dedicated tare weighbeam with a locking poise. Without this statement, you could not apply tolerances to the indication of the tare weighbeam. With an electronic scale, the dedicated tare display is rare, but the approach is the same as the dedicated weighbeam. A digital value in the tare display will be transferred from the gross weight display when the tare mechanism is activated. We expect the value to match the original gross weight exactly, and thus tolerances should apply. This does not apply to a preset tare since a preset tare is not actually weighed, but introduced externally. Also remember that the tare display will remain at the same value, regardless of the load on the load receptor, until another tare mechanism is activated, or the tare is cleared.**
4. **Errors in net values recorded on a dynamic monorail scale. – The dynamic monorail is a unique case since these instruments only record net weight. In OIML these devices are not part of R76 on which the Scales Code is based, but rather R51. The text further clarifies that tolerances are not applied to net values on other types of scales when a preset tare is in operation.**

The graphic highlights the difference between tare and preset tare devices. The values are in d. In the example, the gross value of the tare is about 3.4 d. When using a tare mechanism, the center of net zero is set at the gross value of 3.4 d. If the tare is removed the no load is at -3.4 d. With a tare mechanism the net divisions may not align with the gross divisions since the tare may not be a whole number of d.



With a preset tare mechanism, the rounded value of the tare entry is subtracted from the gross weight. This results in a net scale that aligns with the gross scale but is offset by the rounded value of the tare. With keyboard tare, the tare is entered at gross zero, resulting in an indication of -3 d. With a programmed tare like a POS system, the rounded gross weight is displayed and the 3 d tare associated with the PLU is subtracted before the net weight is printed. The

1 preset tare may have an inherent rounding error of up to 0.5 d from the actual tare weight. In addition, any error in the
 2 instrument gets added to this rounding error. By not applying tolerances you do not penalize the instrument for these
 3 two errors. Remember that the user may be cited for misrepresentation of the quantity (UWML §15, if the wrong
 4 preset tare is entered. Also, you can use the tare mechanism to test the instrument accuracy in net mode. This is what
 5 was intended in the current language of T.N.2.1. referring to “any possible tare load using certified weights.” That is,
 6 applying a known weight and using the semi-automatic tare to set the net zero. In the R76 test in net mode, the applied
 7 tare load is chosen near the break point between divisions to verify that the net zero is set accurate to $\frac{1}{4}$ e.

8 **Comments in Favor:**

9 **Regulatory:**

- 10 •

11 **Industry:**

- 12 •

13 **Advisory:**

- 14 •

15 **Comments Against:**

16 **Regulatory:**

- 17 •

18 **Industry:**

- 19 •

20 **Advisory:**

- 21 •

22 **Neutral Comments:**

23 **Regulatory:**

- 24 •

25 **Industry:**

- 26 •

27 **Advisory:**

- 28 •

29 **Item Development:**

30 [Explain any changes made to the original proposal and committee recommendations]

31 **Regional Associations' Comments:**

32 [Refresh each year based on regional reports]

33 CWMA 2023 Interim Meeting: No comments were heard. The committee recommends this item as developing and
 34 seeks input from industry stakeholders.

WWMA 2023 Annual Meeting: During the WWMA 2023 annual meeting the following comments were received:

Mr. Cory Hainy (Representing the SMA): The SMA has not had the opportunity to assess the item and will meet in November 2023.

Mr. Steve Harrington (Oregon Department of Agriculture, Weights and Measures Program): Expressed concerns regarding terminology throughout the item but acknowledged that there is merit to the item. He recommended this item be separated by the appropriate sections that correspond to the handbook and that the items then be blocked together. He also recommended this item be assigned a developing status.

Mr. Kevin Schnepf (California, Division of Measurement Standards): Echoed the comments from Mr. Harrington of Oregon. Mr. Schnepf supported a developing status and looks forward to comments from the SMA.

The WWMA S&T Committee recommended that this item be assigned a Developing status. This will allow the submitter the opportunity to address the comments heard during the open hearings and receive feedback from stakeholders. The WWMA S&T Committee further recommends the items be separated accordingly and then Blocked together, specifically separating the scale code sections into one item and the definitions sections into a second item.

As a point of technical merit to the submitter, proposed items are best presented when they are specific and clear for the body to evaluate the proposal accurately. This specific comment is in reference to the alternative proposals of S.1.17. found on page S&T – 227 of the WWMA 2023 S&T Agenda. The committee recommended that the submitter determine which version of S.1.17. best fits the purpose of this proposal and remove the other version.

SWMA 2023 Annual Meeting: Cory Hainy with SMA stated they have not reviewed the item.

The committee disagrees with the justification and the use of alternate proposals within the item.

The committee recommends the item be withdrawn.

NEWMA 2023 Interim Meeting: A regulator from Holliston, Massachusetts stated the Cannabis Task Group (CTG) is working with the Scale Verification Task Group. A meeting was scheduled for mid-September. The CTG hopes to have something finalized for the Interim meeting. The State of NY supports further development and it is necessary for clarification. There was discussion of assigning this item to the Scale Verification Task Group but it was noted that there would have to be a change of scope. Upon consensus of the body, the Committee recommends this item be Developing.

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-22.3 D UR.3.3. Single-Draft Vehicle Weighing., and UR.3.4. Axle and Axle Group Weight Values.

NOTE: At the 2023 Interim Meeting, the Committee agreed to remove this item from Block 6.

Source:

NIST, Office of Weights and Measures

Purpose:

This proposed change is intended to add clarification regarding the implications of using weighing and measuring devices for transactions that may be considered by some as commercial while there is no clear guidance provided.

Item Under Consideration:

Amend Handbook 44, Scales Code as follows:

UR.3.3. Single-Draft Vehicle Weighing. – A vehicle or a coupled-vehicle combination shall be commercially weighed on a vehicle scale only as a single draft. That is, the total weight of such a vehicle or combination shall not be determined by adding together the results obtained by separately and not simultaneously weighing each end of such vehicle or individual elements of such coupled combination. However, the weight of:

(a) a coupled combination may be determined by uncoupling the various elements (tractor, semitrailer, trailer), weighing each unit separately as a single draft, and adding together the results; or

(b) a vehicle or coupled-vehicle combination may be determined by adding together the weights obtained while all individual elements are resting simultaneously on more than one scale platform.

~~Note:~~ This paragraph does not apply to highway-law-enforcement scales, ~~and~~ scales used for the collection of statistical data, or scales used to charge a fee for the service of providing weights of the different axle-, axle-group loads, and total weight of vehicles and coupled-vehicle combinations when the only use of those values is to determine compliance with highway weight requirements and safe distribution of the load.

(Added 1992) (Amended 20XX)

And

UR.3.4. Weighing of Axle- and Axle-Group Loads – Establishing weight values for the different individual axle- and axle-group loads of a vehicle or coupled-vehicle combination is oftentimes necessary to verify compliance with established highway weight requirements and safe distribution of the load. When a fee is charged for this service, the scale’s application is considered “commercial” under the provisions of paragraph G-A.1. Commercial and Law Enforcement Equipment and the scale shall comply with all applicable NIST Handbook 44 requirements for commercial weighing systems.

When weight values for axle- and/or axle-group loads are obtained using multiple-independent platform vehicle scales systems in which all parts of the vehicle or coupled-vehicle combination being weighed are simultaneously positioned on live elements of the scale, the values for the different axle- and axle-group loads may be summed to establish the legal gross vehicle weight.

In no case, however, shall a summed result of the different axle- and axle-group loads of a vehicle or coupled vehicle combination weighed in multiple drafts be used as the legal gross vehicle weight unless subparts (a) or (b) of paragraph UR.3.3. Single-Draft Vehicle Weighing is met.

(Added 20XX)

Renumber existing paragraphs UR.3.4 through UR.3.12.

Previous Action:

2022: Developing

Original Justification:

OWM has noted a number of inquiries submitted to our office for explanation on the many and various issues involved with the use of weighing or measuring devices as commercial devices when there is charge for doing so. Law enforcement devices may be regulated in a different manner than commercial devices (e.g., allows highway weight limit enforcement through multi-draft weighing) when commercial devices are not allowed to be used in that way.

The submitter pointed out that there seems to be a difference in opinions regarding this practice constitutes a commercial transaction.

The submitter requested voting status for these items in 2022.

Comments in Favor:

Regulatory:

- 2022 Interim: Supported the language alignment of GEN 22.1 with L&R Block 2. Support for separating the blocked items.
- 2023 Interim: A regulator supports the proposed changes submitted by the SMA but believes the block should remain developing.

Industry:

- 2022 Interim: SMA provided written comments and open hearing testimony that the items should be separated. Supports each item, but recommends changes to SCL 22.1.
- 2023 Interim: An industry member commented that they support SCL-22.1 as voting with the changes supplied by the SMA, but agrees that SCL-22.3 should remain developing.

Advisory:

- 2022 Interim: NIST (submitter) recommended that GEN 22.1 be separated and given voting status. Asked that remainder of block remain developing.
- 2023 Interim: NIST (the submitter) agrees with the SMA changes and recommends voting. They also agree that SCL-22.3 should remain developing.
- 2023 Annual: NIST (the submitter) stated they had worked with SMA to incorporate their suggested changes and included those changes in the NIST Analysis of the item.

Comments Against:

Regulatory:

- None

Industry:

- None

Advisory:

- None

Neutral Comments:

Regulatory:

- 2022 Interim: SCL code sections could be reworded for easier understanding and comprehension of commercial vs. non-commercial.

Industry:

- 2022 Interim: Recommended that tickets should have identification of axle groups.

Advisory:

- None

Item Development:

NCWM 2022 Interim Meeting: During the S&T Committee work session, the committee agreed to remove item GEN 22.1 from Block 6. The committee recommendations pertain to the remainder of the block only (SCL 22.1 & SCL 22.3). The committee received updated language from the submitter for item SCL 22.1.

This item has been assigned to the submitter for further development. For more information or to provide comment, please contact:

Mr. Loren Minnich
NIST Office of Weights and Measures
loren.minnich@nist.gov

NCWM 2022 Annual Meeting: Tina Butcher, NIST OWM is requesting feedback on the two items in Block 6D. Allow additional time for input. Paragraph numbers have been updated in the proposal and amendments have been made since 2022 Interim meeting and are posted on the website.

NCWM 2023 Interim Meeting: The committee recommends the submitter work with interested parties to further develop SCL-22.3.

NCWM 2023 Annual Meeting: The committee updated the item under consideration using amended language provided by NIST OWM and included in their analysis of the item.

Regional Associations' Comments:

CWMA 2023 Interim Meeting: No comments were heard.
The committee recommends this item as a voting item

WWMA 2023 Annual Meeting: During the WWMA 2023 annual meeting the following comments were received:

Mr. Loren Minnich (NIST OWM): Previous SMA comments have been addressed and recommended this item is ready for a vote.

Mr. Cory Hainy (Representing the SMA): Expressed that the April 2023 analysis represents their position prior to the updates to the item and will reconvene in November 2023 to analyze the item. They support this item with a developing status.

Mr. Steve Harrington (Oregon Department of Agriculture, Weights and Measures Program): Supported development of this item. He raised concerns that the device may potentially be used inappropriately to capture vehicle gross weight and recommends adding a user requirement of posting on a sign or recording on a scale ticket be added to the item to address this concern.

Mr. Kevin Schnepf (California Division of Measurement Standards): Supports a voting status contingent on SMA analysis of the item.

The WWMA S&T Committee recommends that this item be assigned a Developing status to allow the submitter the opportunity to consider the comments heard on the floor and receive feedback from stakeholders.

SWMA 2023 Annual Meeting: Cory Hainy, SMA, stated their position is based on the April version of the item, but they have not had a chance to meet and review the changes to this item. He anticipates the SMA will be in favor of the item with the most recent changes.

The committee feels the item is fully developed and recommends it move forward as a Voting item.

NEWMA 2023 Interim Meeting: The State of NY supports as a developing item but cautions that the change to the Note could allow split weighing. The State of New Hampshire and the Commonwealths of Massachusetts and Pennsylvania concur. Upon consensus of the body, the Committee recommends this item be Developing.

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

SCL-23.3 A Verification Scale Division e: Multiple Sections Including, T.N.1.3., Table 6., T.N.3., T.N.4., T.N.6., T.N.8., T.N.9., T.1., T.2., S.1.1.1., T.N.1.2., Table S.6.3.a., Table S.3.6.b., Appendix D, S.1.2.2., Table 3., S.5.4., UR.3., Table 8.

Source:

NCWM Verification Scale Division e Task Group

Purpose:

The mission of the task group, as defined by the S&T Committee, was to review Handbook 44, Section 2.20. Scales and relevant portions of OIML R76, using the items included in S&T Agenda Items: Block 2 as a reference point, and recommend changes as necessary to:

1. Clarify how the error is determined in relation to the verification scale division (e) and the scale division (d)
2. Clarify which is the proper reference; the verification scale division (e) or the scale division (d) throughout this section
3. Ensure proper selection of a scale in reference to the verification scale division (e) and the scale division (d)
4. Clarify the relationship between the verification scale division (e) or the scale division (d)

Background:

This proposal is being brought forward because the HB44 Scales Code is confusing and contradictory in several respects. This is particularly related to e and d and this has been true since the code was created as a translation of OIML R76 into HB44 format and adopted in 1984. In the creation process, the translators made a few translation errors that changed meanings or simply left important things out. Even small changes can have significant effects. We have been struggling with the contradictions ever since. In some cases, we continue to apply the code in ways that do not follow the written text.

The original submitter (Ross Andersen, NY retired) compared each paragraph referring to d or e in HB44 to the corresponding sections of R76 and identified a number of translation errors that either changed the meaning or left out something important from R76. He also proposed fixes. The Task Group continued the work and has prepared this final proposal. The sheer number of changes makes the proposal appear complicated. The changes all flow from the initial translation errors. The Task Group believes the changes are absolutely necessary, and the changes will eliminate the known conflicts and contradictions in the Code. This will subsequently reduce confusion in enforcing it.

Proposed changes to Appendix D. Definitions are presented first. The proposed changes and additions to the Scales Code will be presented in order of appearance. For each change or group of changes there will be a brief justification. The translators made key errors in the translation of two paragraphs dealing with basic principles. The repair of each of these paragraphs has ripple effects requiring corresponding changes in multiple related paragraphs throughout the code.

Proposed Changes to the Scale Code

Changes proposed to Appendix D. Definitions

auxiliary indication – a means to increase the displayed resolution of a weighing device, such as a rider or vernier on an analog device, or a differentiated least significant digit to the right of the decimal point on a digital device. [2.20]

1 (Added 20XX)

2 extended display-mode. – a means to temporarily change the scale division (d) to a value less than the
 3 verification scale interval (e), following a manual command. [2.20]

4 (Added 20XX)

5 n_{\max} (maximum number of verification scale intervals). – The maximum number of verification scale intervals
 6 for which a main element or load cell complies with the applicable requirements. The maximum number of
 7 verification scale intervals permitted for an installation is limited to the lowest n_{\max} marked on the scale
 8 indicating element, weighing element, or load cell. [2.20]

9 (Added 20XX)

10 n_{\max} (maximum number of scale divisions). – The maximum number of scale divisions for which a main element
 11 or load cell complies with the applicable requirements. The maximum number of scale divisions permitted for an
 12 installation is limited to the lowest n_{\max} marked on the scale indicating element, weighing element, or load cell.
 13 [2.20, 2.21, 2.24]

14 (Added 1997) (Amended 20XX)

15 scale division, number of (n). – See “verification scale interval, number of (n).” Quotient of the capacity divided by
 16 the value of the verification scale division. [2.20]

17 (Amended 20XX)

18 verification scale ~~division~~interval, value of (e). – A value, expressed in units of weight (mass) and specified by the
 19 manufacturer of a device, by which the tolerance values and the accuracy class applicable to the device are
 20 determined. The verification scale ~~division~~interval is applied to all scales, in particular to ungraduated devices
 21 since they have no graduations. ~~The verification scale division (e) may be different from the displayed scale~~
 22 ~~division (d) for certain other devices used for weight classifying or weighing in pre-determined amounts, and~~
 23 ~~certain other Class I and II scales.~~[2.20]

24 (Amended 20XX)

25 verification scale interval, number of (n). – Quotient of the capacity divided by the value of the verification
 26 scale interval. [2.20]

$$n = \frac{\text{Capacity}}{e}$$

28 (Added 20XX)

29 weight classifier. – A digital scale that rounds weight values up to the next scale division. These scales usually have
 30 a verification scale ~~division~~interval (e) that is smaller than the displayed scale division (d). [2.20]

31 (Added 1987) (Amended 20XX)

32 **Changes proposed to Section 2.20. Scales Code**

33 **S.1.1.1. Digital Indicating Elements.**

- 34 (a) A digital zero indication shall represent a balance condition that is within $\pm \frac{1}{2}$ the value of the scale
 35 division d.

36 (b) After zero-setting (gross zero or net zero after a tare operation) the effect of zero deviation on the
 37 result of the weighing shall be not more than $\pm 0.25 e$.

38 [Nonretroactive as of January 1, 20XX]

~~(b)(c)~~ A digital indicating device shall either automatically maintain a “center-of-zero” condition to $\pm \frac{1}{4}$ scale division or less, or have an auxiliary or supplemental “center-of-zero” indicator that defines a zero-balance condition to $\pm \frac{1}{4}$ of a scale division or less. A “center-of-zero” indication may operate when zero is indicated for gross and/or net mode(s). 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 $\pm 0.25 e$. 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 $\pm 0.25 e$.

[Nonretroactive as of January 1, 1993]

~~(e)(d)~~ For electronic cash registers (ECRs) and point-of-sale systems (POS systems) the display of measurement units shall be a minimum of 9.5 mm (3/8 inch) in height.

[Nonretroactive as of January 1, 2021]

(Added 2019)

(Amended 1992, 2008, ~~and 2019~~, and 20XX)

S.1.2. Value of Scale Division Units. – Except for batching scales and weighing systems used exclusively for weighing in predetermined amounts, the value of a scale division “d” and the verification scale interval “e” 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; or

Examples: scale divisions may be 10, 20, 50, 100; or 0.01, 0.02, 0.05; or 0.1, 0.2, 0.5, etc.

(c) a binary submultiple of a specific unit of weight.

Examples: scale divisions may be $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{16}$, etc.

[Nonretroactive as of January 1, 1986]

(Amended 20XX)

S.1.2.1. Digital Indicating Scales, Units. – Except for postal scales, a digital-indicating scale shall indicate weight values using only a single unit of measure. Weight values shall be presented in a decimal format with the value of the scale division “d” expressed as 1, 2, or 5, or a decimal multiple or submultiple of 1, 2, or 5.

The requirement that the value of the scale division “d” be expressed only as 1, 2, or 5, or a decimal multiple or submultiple of only 1, 2, or 5 does not apply to net weight indications and recorded representations that are calculated from gross and tare weight indications where the scale division “d” of the gross weight is different from the scale division “d” of the tare weight(s) on multi-interval or multiple range scales. For example, a multiple range or multi-interval scale may indicate and record tare weights in a lower weighing range (WR) or weighing segment (WS), gross weights in the higher weighing range or weighing segment, and net weights

as follows:

55 kg Gross Weight (WR2 d = 5 kg)	10.05 lb Gross Weight (WS2 d = 0.05 lb)
– 4 kg Tare Weight (WR1 d = 2 kg)	– 0.06 lb Tare Weight (WS1 d = 0.02 lb)
= 51 kg Net Weight (Mathematically Correct)	= 9.99 lb Net Weight (Mathematically Correct)

[Nonretroactive as of January 1, 1989]

(Added 1987) (Amended 2008 and 20XX)

S.1.2.2. Verification Scale Interval “e”.

S.1.2.2.1. Class I and II Scales and Dynamic Monorail Scales. —~~If $e \neq d$, the verification scale interval “e” shall be determined by the expression:~~

$$d < e \leq 10 d$$

~~If the displayed division (d) is less than the verification division (e), then the verification division shall less than or equal to 10 times the displayed division.~~

~~The value of e must satisfy the relationship, $e = 10^k$ of the unit of measure, where k is a positive or negative whole number or zero. This requirement does not apply to a Class I device with $d < 1$ mg where $e = 1$ mg. If $e \neq d$, the value of “d” shall be a decimal submultiple of “e,” and the ratio shall not be more than 10:1. If $e \neq d$, and both “e” and “d” are continuously displayed during normal operation, then “d” shall be differentiated from “e” by size, shape, color, etc. throughout the range of weights displayed as “d.”~~

~~(Added 1999)~~

Scales Equipped with an Auxiliary Indication. – Only a Class I or II scale or a dynamic monorail may be equipped with an auxiliary indication. The auxiliary indication may be either a rider or vernier on an analog device, or a scale division “d” to the right of the decimal point on a digital device that is differentiated, for example by size, shape, or color.

A scale with an auxiliary indication shall not be equipped with an extended display mode.

The verification scale interval “e” on a scale equipped with an auxiliary indication shall be determined as follows:

(a) The value of “e” shall be greater than “d” and less than or equal to 10 “d” ($d < e \leq 10 d$), and

(b) The value of “e” must satisfy the relationship, $e = 10^k$ of the unit of measure, where k is a positive or negative whole number or zero.

Examples:

$10^{-2}=0.01$, $10^{-1}=0.1$, $10^0=1$, $10^1=10$, $10^2=100$, etc.

The requirement in subpart (a) does not apply to a Class I devices with $e = 1$ mg, where d shall be less than “e” ($d < e$).

Examples:

If $e = 1$ g for Class I or II, then “d” may only be 0.5 g, 0.2 g, or 0.1 g

If $e = 1$ mg for Class I, then “d” may be 0.5 mg, 0.2 mg, 0.1 mg, 0.05 mg, 0.02 mg, etc.

(Added 1999) (Amended 20XX)

S.1.2.2.2. Class III, III L, and III L Scales. – The value of “e” is specified by the manufacturer as marked on the device. Except for dynamic monorail scales and weight classifiers, “e” must be ~~less than or~~ equal to “d.”

(Added 1999) (Amended 20XX)

S.1.2.2.2.1. Dynamic Monorail Scales. – On a dynamic monorail scale the value of “e” shall be equal to or greater than “d”.

S.1.2.2.2.2. Weight Classifiers. – On a weight classifier, such as a postal or shipping scale that rounds up and is marked for special use, the value of “e” shall be equal to or less than “d”.

(Added 20XX)

S.1.2.2.3. Extended Display Mode. – A scale with an auxiliary indication shall not be equipped with an extended display mode. When a scale is equipped with an extended display mode, displaying an indication with a scale division “d” smaller than “e” shall be possible only:

(a) while pressing a key; or

(b) for a period not exceeding 5 seconds after a manual command.

Printing or transferring data via interface shall not be possible while the extended display mode is in operation.

(Added 20XX)

(Amended 2021 **and 20XX**)

S.5.4. Relationship of Minimum Load Cell Verification Interval Value to the Verification Scale

Division Interval. – The relationship of the value for the minimum load cell verification scale interval, v_{min} , to the verification scale ~~division interval d~~ , for a specific scale using National Type Evaluation Program (NTEP) certified load cells shall comply with the following formulae where N is the number of load cells in a single independent¹ weighing/load-receiving element (such as hopper, railroad track, or vehicle scale weighing/load-receiving elements):

(a) $v_{min} \leq \frac{d+e}{\sqrt{N}}$ for scales without lever systems; and

(b) $v_{min} \leq \frac{d+e}{\sqrt{N} \times (\text{scale multiple})}$ for scales with lever system

¹“Independent” means with a weighing/load-receiving element not attached to adjacent elements and with its own A/D conversion circuitry and displayed weight.

~~**[*When the value of the scale division, d , is different from the verification scale division, e , for the scale, the value of e must be used in the formulae above.]**~~

This requirement does not apply to complete weighing/load-receiving elements or scales, which satisfy all the following criteria:

- *the complete weighing/load-receiving element or scale has been evaluated for compliance with T.N.8.1. Temperature under the NTEP;*
- *the complete weighing/load-receiving element or scale has received an NTEP Certificate of Conformance; and*
- *the complete weighing/load-receiving element or scale is equipped with an automatic zero-tracking mechanism which cannot be made inoperative in the normal weighing mode. (A test mode which permits the disabling of the automatic zero-tracking mechanism is permissible, provided the scale cannot function normally while in this mode.*

[Nonretroactive as of January 1, 1994]

(Added 1993) (Amended 1996, 2016 **and 20XX**)

Table 3.
Parameters for Accuracy Classes

Table 3. Parameters for Accuracy Classes			
Class	Value of the Verification Scale Division <u>Interval</u> (d or e^1)	Number of <u>Verification Scale</u> ⁴³ Divisions <u>Intervals</u> (n)	
		Minimum	Maximum
SI Units			
I	equal to or greater than 1 mg	50 000	--
II	1 to 50 mg, inclusive	100	100 000
III ^{21,54}	equal to or greater than 100 mg	5 000	100 000
	0.1 to 2 g, inclusive	100	10 000
	equal to or greater than 5 g	500	10 000
III L ³²	equal to or greater than 2 kg	2 000	10 000
III	equal to or greater than 5 g	100	1 200

¹ ~~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 “e” is the value of the scale division immediately preceding the auxiliary means.~~

²¹ A Class III scale marked “For prescription weighing only” may have a verification scale ~~division~~interval (e) not less than 0.01 g.
(Added 1986) (Amended 2003)

³² The value of a verification scale ~~division~~interval (e) for crane and hopper (other than grain hopper) scales shall be not less than 0.2 kg (0.5 lb). The minimum number of verification scale ~~divisions~~intervals (n) shall be not less than 1000.
(Amended 20XX)

⁴³ On a multiple range or multi-interval scale, the number of divisions for each range independently shall not exceed the maximum specified for the accuracy class. The number of verification scale ~~divisions~~intervals, (n), for each weighing range is determined by dividing the scale capacity for each range by the verification scale ~~division~~interval, (e), for each range. On a scale system with multiple load-receiving elements and multiple indications, each element considered shall not independently exceed the maximum specified for the accuracy class. If the system has a summing indicator, the n_{max} for the summed indication shall not exceed the maximum specified for the accuracy class.
(Added 1997)**(Amended 20XX)**

⁵⁴ The minimum number of verification scale ~~divisions~~intervals (n) for a Class III Hopper Scale used for weighing grain shall be 2000.)
(Amended 20XX)

1 [Nonretroactive as of January 1, 1986]

1 (Amended 1986, 1987, 1997, 1998, 1999, 2003, ~~and~~ 2004, and 20XX)

Table S.6.3.a. Marking Requirements					
To Be Marked With ↓	Weighing Equipment				
	Weighing, Load-Receiving, and Indicating Element in Same Housing or Covered on the Same CC ¹	Indicating Element not Permanently Attached to Weighing and Load-Receiving Element or Covered by a Separate CC	Weighing and Load-Receiving Element Not Permanently Attached to Indicating Element or Covered by a Separate CC	Load Cell with CC (11)	Other Equipment or Device (10)
Manufacturer's ID (1)	X	X	X	X	X
Model Designation and Prefix (1)	X	X	X	X	X
Serial Number and Prefix (2)	X	X	X	X	X (16)
Certificate of Conformance Number (CC) (23)	X	X	X	X	X (23)
Accuracy Class (17)	X	X (8)	X (19)	X	
Nominal Capacity (3)(18)(20)	X	X	X		
Value of Scale Division, "d" (3)(4)	X	X			
Value of <u>Verification Scale Interval</u> , "e" (3)(4)	X	X			
Temperature Limits (5)	X	X	X	X	
Concentrated Load Capacity (CLC) (12)(20)(22)					
Special Application (13)	X	X	X		
Maximum Number of <u>Verification Scale Divisions</u> <u>Intervals</u> (n _{max}) (6)		X (8)	X (19)	X	

2 **Many rows of the table are not included in this proposal for brevity.**

3 (Added 1990) (Amended 1992, 1999, 2000, 2001, 2002, ~~and~~ 2004, and 20XX)

Table S.6.3.b.
Notes for Table S.6.3.a. Marking Requirements

3. The device shall be marked with the nominal capacity. The nominal capacity may be prefaced by the terms “capacity” or “Max.” For any scale where the value of “e” is equal to the value of “d” (see S.1.2.2.), the nominal capacity shall be shown together with the value of the scale division “d” or the verification scale interval “e” (e.g., $15 \times 0.005 \text{ kg}$, ~~$30 \times 0.01 \text{ kg}$~~ , or capacity = 15 kg , $d = 0.005 \text{ kg}$, or Max 15 kg $e = 0.005 \text{ kg}$) in a clear and conspicuous manner and be readily apparent when viewing the reading face of the scale indicator unless already apparent by the design of the device. On multiple range or multi-interval scales the value of the ~~Each~~ scale division value “d” or verification scale interval “e” or weight unit shall be marked together with its associated nominal capacity on multiple range or multi-interval scales. For any scale that has no “d” or any scale where “e” does not equal “d” refer to Note 4.
[Nonretroactive as of January 1, 1983]
(Amended 2005 and 20XX)
4. Required only if different from “d.” Exceptions to Note 3 regarding marking of “e” and “d.”
 - (a) For an ungraduated scale such as an equal arm scale where the scale graduations do not represent a fixed weight quantity, the nominal capacity shall be shown together with the verification scale interval “e” (e.g. capacity $1,000 \text{ g}$ $e = 0.1 \text{ g}$, or Max $1,000 \text{ g}$ $e = 0.1 \text{ g}$). These devices have no “d.”
 - (b) For a scale where e does not equal d, such as a scale equipped with an auxiliary indication or a weight classifier marked for special use, the nominal capacity shall be shown together with the scale division “d” and the verification scale interval “e,” (e.g., capacity $1,000 \text{ g}$ $e = 0.1 \text{ g}$ $d = 0.01 \text{ g}$, or Max $1,000 \text{ g}$ $e = 0.1 \text{ g}$ $d = 0.01 \text{ g}$).
[Nonretroactive as of January 1, 1986]
(Amended 20XX)
5. Required only on Class III, III L, and IIII devices if the temperature range on the NTEP CC is narrower than and within -10°C to 40°C (14°F to 104°F). [Nonretroactive as of January 1, 1986]
(Amended 1999)
6. This value may be stated on load cells in units of 1000; e.g., n: 10 is 10 000 divisions.
[Nonretroactive as of January 1, 1988]
7. Denotes compliance for single or multiple load cell applications. It is acceptable to use a load cell with the “S” or Single Cell designation in multiple load cell applications as long as all other parameters meet applicable requirements. A load cell with the “M” or Multiple Cell designation can be used only in multiple load cell applications.
[Nonretroactive as of January 1, 1988]
(Amended 1999)
8. An indicating element not permanently attached to a weighing element shall be clearly and permanently marked with the accuracy Class of I, II, III, III L, or IIII, as appropriate, and the maximum number of verification scale divisions intervals, n_{max} , for which the indicator complies with the applicable requirement. Indicating elements that qualify for use in both Class III and III L applications may be marked III/III L and shall be marked with the ~~maximum number of scale divisions~~ n_{max} for which the device complies with the applicable requirements for each accuracy class.
[Nonretroactive as of January 1, 1988]
(Amended 20XX)

T.1. Tolerance Values.

T.1.1. General. – The tolerances applicable to devices not marked with an accuracy class shall have the tolerances applied as specified in Table T.1.1. Tolerances for Unmarked Scales.

Note: When Table T.1.1. refers to T.N. sections it shall be accepted that the scale division d on the unmarked scale always equals the verification scale interval e.

(Amended 1990 and 20XX)

T.2. Sensitivity Requirement (SR).

T.2.2. General. – Except for scales specified in paragraphs T.2.3. Prescription Scales through T.2.8. Railway Track Scales: 2 ~~(e)~~ **d**, 0.2 % of the scale capacity, or 40 lb, whichever is least.

(Amended 20XX)

T.2.4. Jewelers' Scales.

T.2.4.2. With More Than One-Half Ounce Capacity. – 1 ~~(e)~~ **d** or 0.05 % of the scale capacity, whichever is less.

(Amended 20XX)

T.2.7. Vehicle, Axle-Load, Livestock, and Animal Scales.

T.2.7.1. Equipped With Balance Indicators. – 1 ~~(e)~~ **d**.

(Amended 20XX)

T.2.7.2. Not Equipped With Balance Indicators. – 2 ~~(e)~~ **d** or 0.2 % of the scale capacity, whichever is less.

(Amended 20XX)

T.2.8. Railway Track Scales. – 3 ~~(e)~~ **d** or 100 lb, whichever is less.

(Amended 20XX)

T.N.1. Principles.

T.N.1.1. Design. – The tolerance for a weighing device is a performance requirement independent of the design principle used.

T.N.1.2. Accuracy Classes. – Weighing devices are divided into accuracy classes according to the number of ~~verification~~ scale ~~divisions~~**intervals** (n) and the value of the ~~verification~~ scale ~~division~~**interval** ~~(d)~~**(e)**.

(Amended 20XX)

T.N.1.3. Verification Scale ~~Division~~Interval**.** – The tolerance for a weighing device is related to the value of ~~the scale division (d) or the value of~~ the verification scale ~~division~~**interval** (e) and is ~~generally~~ expressed in terms of ~~d or e~~.

(Amended 20XX)

T.N.3. Tolerance Values.

T.N.3.4. Crane and Hopper (Other than Grain Hopper) Scales. – The maintenance and acceptance tolerances shall be as specified in T.N.3.1. Maintenance Tolerance Values and T.N.3.2. Acceptance Tolerance

Values for Class III L, except that the tolerance for crane and construction materials hopper scales shall not be less than 1 ~~g~~ or 0.1 % of the scale capacity, whichever is less.
(Amended 1986 and 20XX)

Table 6. Maintenance Tolerances (All values in this table are in <u>verification</u> scale divisions <u>intervals</u> (e))				
Tolerance in Scale Divisions				
	1	2	3	5
Class	Test Load <u>Applied</u>			
I	0 - 50 000	50 001 - 200 000	200 001 +	
II	0 - 5 000	5 001 - 20 000	20 001 +	
III	0 - 500	501 - 2 000	2 001 - 4 000	4 001 +
III L	0 - 50	51 - 200	201 - 400	401 +
III L	0 - 500	501 - 1 000	(Add 1 g for each additional 500 g or fraction thereof)	

(Amended 20XX)

T.N.4. Agreement of Indications.

...

T.N.4.3. Single Indicating Element/Multiple Indications. – In the case of an analog indicating element equipped with two or more indicating means within the same element, the difference in the weight indications for any load other than zero shall not be greater than one-half the value of the verification scale ~~division~~ interval (e) (~~d~~) and be within tolerance limits.

(Amended 1986 and 20XX)

T.N.6. Sensitivity. – This section is applicable to all nonautomatic-indicating scales marked I, II, III, III L, or IIII.

T.N.6.1. Test Load.

(a) The test load for sensitivity for nonautomatic-indicating vehicle, axle-load, livestock, and animal scales shall be 1 ~~de~~ for scales equipped with balance indicator, and 2 ~~de~~ or 0.2 % of the scale capacity, whichever is less, for scales not equipped with balance indicators.

(b) For all other nonautomatic-indicating scales, the test load for sensitivity shall be 1 ~~de~~ at zero and 2 ~~de~~ at maximum test load.

(Amended 20XX)

T.N.8. Influence Factors.

...

T.N.8.1.3. Temperature Effect on Zero-Load Balance. – The zero-load indication shall not vary by more than:

(a) three ~~divisions~~ per 5 °C (9 °F) change in temperature for Class III L devices; or

(b) one ~~division~~ per 5 °C (9 °F) change in temperature for all other devices.

(Amended 1990 and 20XX)

T.N.9. 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 one ~~scale division (d)~~; or the equipment shall:

(a) blank the indication; or

(b) provide an error message; or

(c) the indication shall be so completely unstable that it cannot be interpreted, or transmitted into memory or to a recording element, as a correct measurement value.

The tolerance in T.N.9. Radio Frequency Interference (RFI) and Other Electromagnetic Interference Susceptibility is to be applied independently of other tolerances. For example, if indications are at allowable basic tolerance error limits when the disturbance occurs, then it is acceptable for the indication to exceed the applicable basic tolerances during the disturbance.

(Amended 1997 and 20XX)

UR.3. Use Requirements.

UR.3.1. Recommended Minimum Load. – A recommended minimum load is specified in Table 8 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 Division Interval e</u> (d or e*)	Recommended Minimum Load in <u>Verification Scale Interval e</u> (d or e*)
I	equal to or greater than 0.001 g	100
II	0.001 g to 0.05 g, inclusive	20
	equal to or greater than 0.1 g	50
III	All**	20*
III L	All	50
III	All	10
<p>*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 “e” is the value of the scale division immediately preceding the auxiliary means. For Class III and III L 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<u>5 e</u> is recommended for a weight classifier marked in accordance with a statement identifying its use for special applications.</p>		

(Amended 1990 and 20XX)

Other Issues Discussed by the Task Group:

1. Based on input from the Scale Manufacturers Association and discussion within the task group the decision was made to replace all references to the “verification scale division” with the term “verification scale interval”. The intent of this change is to clearly differentiate between the verification scale interval (e) and the scale division (d)
2. For reference, the following specifications, tolerances, and user requirements are specific to the scale division (d).

Code Section	Applies to	Justification
G-S.5.2.2.(c)	d	Rounding is a function of instrument operation not accuracy
G-S.5.2.2.(d)	d	Requires “d” to be an indicated zero and all digits to the left of “d” to be zero when $d < 1$. Requires “d” to be an indicated zero and all digits to the right of “d” to be zero when $d > 5$.
S.1.1.1.(a)	d	Describes width of the zero division, also sets up the normal rounding half-up/half-down
S.1.2.1	d	Refers to rounded values of d.
S.1.7.(b)	e	This is a classification issue addressing maximum indication above capacity.
S.2.1.2.	d	They must be in terms of d since stability of zero setting applies to d.
S.2.1.3.(all)	d	These limit the window for action of AZT. They must be in terms of d since zero setting applies to d.
S.2.3.	d	Tare division must equal smallest increment displayed.
T.N.7.	d	Discrimination requires an instrument to discriminate to the displayed scale division (zone of uncertainty). This relates to the rounding of the smallest increment.

3. The following specifications, tolerances, and user requirements are specific to the verification scale interval (e). No changes are proposed for these sections.

Code Section	Applies to	Justification
S.1.2.3.	e	This is a classification issue. It ensures accuracy of the piece counts.
N.1.10.	e	Refers to test loads verifying piece count and must be e.
N.4.5.	e	Refers to tolerances in time dependence tests and must be e.
T.N.9.	e	This is a tolerance for reaction to a disturbance.
UR.3.10.	e	As written, this is clearly e. (See item 4 as this may need additional study)

4. The Task Group also observed that method of referencing the scale division and verification scale interval is inconsistent throughout the Code. In some cases, the paragraph only uses the abbreviation d or e, in other cases the name is stated without the abbreviation and in other cases the name is included with the abbreviation d or e in quotes or parentheses. Because the proposal only considers sections that needed change, this issue is not addressed formally in the proposal. The Task Group believes the change to a consistent method could be made editorially by OWM.

Request from the Task Group to the NCWM S&T Committee

The Task Group asks the S&T committee to replace the current S&T Block 2 items (B2) with our recommended changes to NIST HB44. We further ask the committee to make the new “Block 2” an assigned item and return it to the task group so we can consider comments and make changes as needed.

Comments in Favor:

Regulatory:

- 2023 Interim: Doug Musick (State of Kansas - Task Group Chairman) asked for this item to replace Block 2 items. Asking for informational status as wordsmithing efforts are ongoing.

Industry:

- 2023 Interim: Russ Vires (SMA) supports the further development of this item although he questions the moving from block 2 items to SCL 23.3, SMA has provided written comments for block 2.

Advisory:

- None

Comments Against:

Regulatory:

- None

Industry:

- None

Advisory:

- None

Neutral Comments:

Regulatory:

- 2023 Interim: Kevin Schnepf (State of California) commented that item was not reviewed due to late submittal and is neutral to block 2 vs SCL-23.3.

Industry:

- None

Advisory:

- None

Item Development:

NCWM 2023 Interim Meeting: The committee updated the item under consideration with the language the task group forwarded to the committee on January 9, 2023. The committee looks forward to further development from the task group this item is assigned to.

NCWM 2023 Annual Meeting: The Chair of the Specifications and Tolerances Committee asked for a volunteer for chair of the task group.

Regional Associations' Comments:

This item was submitted by an NCWM Task Group following the fall regional meetings in 2022.

CWMA 2023 Interim Meeting: No comments were heard.

The committee recommends this item remain as assigned.

WWMA 2023 Annual Meeting: During the WWMA 2023 annual meeting the following comments were received:

Mr. Loren Minnich (NIST OWM): Stated that the NCWM Verification Scale Division e Task Group now has a chairman and has met to begin cleaning up the language in the item. The task group will make changes to Table 8 so that it only references "verification scale division" (e). Mr. Minnich requested that this item be assigned an Informational status to receive feedback from the body of the NCWM.

Mr. Cory Hainy (Representing the SMA): Supported further development of this item with the recommendation that all references to "verification scale division" be changed to "verification interval". Mr. Hainy stated that the SMA will reconvene in November 2023, and requested that this item continue to be further developed.

Mr. Kevin Schnepf (California Division of Measurement Standards): Echoed the SMA with the request that this item be assigned an Informational status.

The WWMA 2023 S&T Committee recommends that this item be assigned an Informational status to allow the body of the NCWM to provide feedback.

SWMA 2023 Annual Meeting: The committee heard no comments on this item during Open Hearings.

The committee recommends this item remain an Assigned item.

NEWMA 2023 Interim Meeting: Steve Timar, NY, a member of the Scale Verification Task Group stated the TG has met a few times and there has been much progress, including cleaning up some definitions and other language. The TG has changed all references of "verification scale division" to "verification scale interval" throughout the item, as requested by SMA. A regulator Holliston, Massachusetts recommended a voting. A regulator from New Hampshire stated that the change to Table 6 in this proposal is different than New Hampshire's new proposal. Upon consensus of the body, the Committee recommends this item be Voting.

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

SCL-24.3 Table 6. Maintenance Tolerances

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 NIST HB 44, 2.20. Scales, Table 6. Maintenance Tolerances.

Item under Consideration:

Amend Handbook 44 Scales Code as follows:

OPTION 1

Table 6. Maintenance Tolerances (All values in this table are in scale divisions)				
Tolerance in Scale Divisions				
Class	1	2	3	5
	Test Load			
I	0 - 50 000	50 001 - 200 000	200 001 +	
II	0 - 5 000	5 001 - 20 000	20 001 +	
III	0 - 500	501 - 2 000	2 001 - 4 000	4 001 +
IIII	0 - 50	51 - 200	201 - 400	401 +
III L	0 - 500	501 - 1 000	(Add 1 d for each additional 500 d or fraction thereof) <u>(Only applies to Class III L)</u>	

Or

OPTION 2

Table 6. Maintenance Tolerances (All values in this table are in scale divisions)				
Tolerance in Scale Divisions				
Class	1	2	3	5
	Test Load			
I	0 - 50 000	50 001 - 200 000	200 001 +	
II	0 - 5 000	5 001 - 20 000	20 001 +	
III	0 - 500	501 - 2 000	2 001 - 4 000	4 001 +
IIII	0 - 50	51 - 200	201 - 400	401 +
III L	Determine Class III L tolerance by adding (add 1 d for each additional 500 d or fraction thereof <u>(0 – 500 = 1 d, 501 – 1000 = 2 d, 1001 – 1500 = 3 d, 1501 – 2000 = 4 d, etc.)</u>			

Previous Status:

2024: New Proposal

Original Justification:

Table 6. will be easier to read if the vertical and horizontal grid lines are included, as seen in other tables within Handbook 44. The additional remarks added to Class III L will clarify the tolerance requirement for both regulators and other users of the handbook. Understanding Table 6. can be resolved through more thorough training.

The submitter requested Voting status in 2024.

Comments in Favor:

Regulatory:

-

Industry:

-

Advisory:

-

Comments Against:

Regulatory:

-

Industry:

-

Advisory:

-

Neutral Comments:

Regulatory:

-

Industry:

-

Advisory:

-

Item Development:

[Explain any changes made to the original proposal and committee recommendations]

Regional Associations' Comments:

This item was introduced only to NEWMA in Fall 2023.

NEWMA 2023 Interim Meeting: A presentation was provided by a regulator from the State of New Hampshire. The basis for the changes is to modify the appearance of table to be easier to read by adding horizontal and vertical lines and to add clarification for Class III L scales. Two options for modification of the table have been provided. The regulator believes this could be a simple editorial change. The State of New York and Commonwealth of Pennsylvania believe the proposed modifications add value and clarity. Upon consensus of the body, the Committee recommends a Developing status, with both options presented to the membership for further discussion.

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-22.2 A UR.1. Selection Requirements, UR.1.X. Cannabis

Source:

NCWM Cannabis Task Group

NOTE: The Scales Focus Group of the NCWM Cannabis Task Group modified the proposal in the fall of 2022 as represented below.

The Scales Subgroup recognizes that, in addition to the proposed modifications of Table 7a, guidance is needed to assist businesses and inspectors in identifying suitable devices for use in various applications used to weigh Cannabis.

The Scales Subgroup plans to continue discussions on the best method(s) for developing that guidance. This may include one or more of the following:

- *Developing a guidance document to assist users, scale service companies, and inspectors in identifying appropriate scales for Cannabis weighing applications.*
- *Revisiting proposed modifications to paragraph UR.1. to either include:*
 - *Proposing minimum requirements for Class II all weighing applications (non- product specific) as is already in place in some states; or*
 - *Proposing minimum requirements for Class II weighing applications used specifically for Cannabis.*

Purpose:

Establish uniform scale suitability requirements among the states for sales of cannabis.

Item Under Consideration:

Amend Handbook 44, Scales Code as follows:

UR.1.1. General.

(a) For devices marked with a class designation, the typical class or type of device for particular weighing applications is shown in Table 7a. Typical Class or Type of Device for Weighing Applications.

(b) For devices not marked with a class designation, Table 7b. Applicable to Devices not Marked with a Class Designation applies.

Table 7a. Typical Class or Type of Device for Weighing Applications	
Class	Weighing Application or Scale Type
I	Precision laboratory weighing <u>and weighing of all Cannabis products</u>
II	Laboratory weighing, precious metals and gem weighing, grain test scales, <u>and weighing of all Cannabis products</u>

III	All commercial weighing not otherwise specified, grain test scales, retail precious metals and semi-precious gem weighing, grain-hopper scales, animal scales, postal scales, vehicle on-board weighing systems with a capacity less than or equal to 30 000 lb, and scales used to determine laundry charges, <u>and weighing of all <i>Cannabis</i> products</u>
III L	Vehicle scales (including weigh-in-motion vehicle scales), vehicle on-board weighing systems with a capacity greater than 30 000 lb, axle-load scales, livestock scales, railway track scales, crane scales, and hopper (other than grain hopper) scales
III	Wheel-load weighers and portable axle-load weighers used for highway weight enforcement
Notes: A scale with a higher accuracy class than that specified as “typical” may be used. <u>The use of italicized text in the references to “<i>Cannabis</i>” in this table 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.</u>	

(Amended 1985, 1986, 1987, 1988, 1992, 1995, 2012, and 2021)

UR.3.1.2. Required Minimum Loads for Cannabis products. - The recommended minimum loads specified in Table 8 shall be considered required minimum loads for scales used to weigh Cannabis and Cannabis-containing products.

[Nonretroactive as of January 1, 20XX]

(Added 20XX)

Previous Action:

2022: Assigned to the Cannabis Task Group.

Original Justification:

As states legalize sales of cannabis in its various forms, the need has arisen for uniform standards for scale suitability. Uniform requirements from one state to the next, will strengthen each jurisdiction’s ability to effectively regulate the industry in a fair and equitable manner. Uniform standards also provide industry with expectations regardless of the jurisdiction, reducing potential conflict or confusion.

Some states may already have scale suitability requirements differing for those proposed here. The task group is hopeful that differences can be resolved so that the standards are the same in every jurisdiction:

The proposed suitability requirements are based on existing standards as set forth by the California Division of Standards, Division of Measurement Standards.

The submitter requested that this item be a Developing Item.

Comments in Favor:

Regulatory:

- 2022 Interim: Several regulatory officials voiced support of continuing to develop this item. The State of Kansas noted that HB44 scale code Table 8 contains “recommended” minimum loads and cannot be used for enforcement. A suggestion was made to use e verification interval (instead of d) for the code application.

Industry:

- 2022 Interim: The Scale Manufacturers Association supports developing the item and recommended aligning the item with HB44 Table 8, Recommended Minimum Load.
- 2023 Interim: Charlie Rutherford (Task Group Co-Chairman) asked for assigned status.
- 2023 Interim: Russ Vires (SMA) commented that user requirements do not typically apply to a particular commodity. Also supported further development and the additions to Table 7A.
- 2023 Annual: Charlie Rutherford, CPR Squared, Inc & Cannabis TG Co-Chair-waiting on items from e vs d TG to progress before making further modifications to this item.

Advisory:

- None

Comments Against:

Regulatory:

- None

Industry:

- 2022 Interim: The Committee heard comments from industry members that do not support this item. An industry member indicated that this proposal is an unprecedented requirement for devices for a specific industry. A&D noted that if the item progresses, they would suggest a minimum scale division of 0.01 g for weighments up to 100 g.

Advisory:

- 2022 Interim: NIST OWM reiterated their written analysis of this item and recommends it being considered as a guidance document only. The full analysis can be found on the NCWM website.

Neutral Comments:

Regulatory:

- 2022 Interim: Some regulators voiced concern that this item should apply not only to cannabis but to all commodities that are of high cost.

Industry:

- None

Advisory:

- None

Item Development:

NCWM 2022 Interim Meeting: After hearing comments from the floor and referencing submitted supporting documents, the Committee has assigned this item back to the NCWM Cannabis Task Group for further development. The Task Group should consider the several proposals for alternate language that were provided by the regional associations. For more information or to provide comment, please contact:

Vince Wolpert
NCWM Cannabis Task Group
vwolpert@azda.gov

Charles Rutherford
NCWM Cannabis Task Group
charlie@cprsquaredinc.com

NCWM 2022 Annual Meeting: The Committee was given an update from Mr. Charles Rutherford, NCWM Cannabis Task Group Co-Chair. In his update, Mr. Rutherford requested that this item remain Assigned to the Task Group for

further discussion. The Scales Focus Group will be regrouping, with Mr. Lou Sakin (Hopkinton, MA) as the Chair, for further development of the item. The Committee has agreed that this item will retain an Assigned status.

NCWM 2023 Interim Meeting: The committee updated the item to include UR-3.1.2., as recommended by NEWMA. The committee has designated this item as assigned per recommendations from the submitters.

NCWM 2023 Annual Meeting: The committee heard from Charles Rutherford (Co-Chair of the task group) that they were waiting on the outcome of item SCL-23.3 before moving forward with this item.

Regional Associations' Comments:

CWMA 2023 Interim Meeting: No comments were heard.

The committee recommends this item remain as assigned.

WWMA 2023 Annual Meeting: During the WWMA 2023 annual meeting the following comments were received:

Mr. Vince Wolpert (NCWM Cannabis Task Group Co-Chair): This item is still being developed by the task group and requested the item remain assigned to the task group.

Mr. Kevin Schnepf (California, Division of Measurement Standards): Questioned basing the suitability of a scale on the type of product. Recommended this item remain assigned to the task group.

Mr. Steven Harrington (Oregon Department of Agriculture, Weights and Measures Program): Echoed Mr. Schnepf.

Mr. Kurt Floren (Los Angeles County, California): Referred to previous language of the item which stated weight ranges for the suitability of the device and the current language now references a product type. Recommended referring to the previous language of weight ranges. Commented Table 7a. is not enforceable and the item should remain assigned to the task group.

Mr. Cory Hainy (Representing the SMA): Recommended a change of language in Table 7a. class III devices, replace the words "All Cannabis" with "non-retail Cannabis". Recommend adding a comment in Table 7a. for reference to Table 8. for scale selection.

Ms. Wendy Hahn (Stanislaus County, California): Echoed Mr. Harrington with an additional concern that the table is confusing and someone may select a class of device that may not be suitable.

Mr. Aaron Yanker (Colorado Dept. of Agriculture Weights and Measures): Supports this item with the proposed changes heard on the floor.

The WWMA 2023 S&T Committee recommends this item remain Assigned to the NCWM Cannabis Task Group and recommends the task group consider the comments heard during the open hearing.

SWMA 2023 Annual Meeting: The committee heard no comments on this item during Open Hearings. The committee recommends this item remain an Assigned item.

NEWMA 2023 Interim Meeting: A regulator from Holliston, Massachusetts, and a Cannabis Task Group member, recommends this item remain as assigned pending the Verification Scale Division Task Group item, as it impacts this item. Upon consensus of the body, the Committee recommends this item be Assigned.

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

AWS – AUTOMATIC WEIGHING SYSTEMS CODE

AWS-24.1 N.1.5. Test Loads.

Source:

Marel Ltd.

Purpose:

Re-word AWS test loads section for clarity and consistency across rest of handbook.

Item under Consideration:

Amend Handbook 44 Automatic Weighing Systems Code as follows:

N.1.5. Test loads. - A performance test shall consist of at least four ~~separate test runs conducted at~~ different test loads according to Table N.1.5. Test Loads, each load being run a minimum of ten consecutive times.

Previous Status:

2024: New Proposal

Original Justification:

Existing wording could be interpreted a number of different ways. This uncertainty bad for NTEP labs, W&M inspectors, and manufacturers. The original intention can be seen in HB 44 AWS N.2.2.2 and in Publication 14, AWS 35.1.7 (copied below for convenience). I have spoken to NCWM staff and had it confirmed that the widely understood interpretation and understanding of note N.1.5. is as my replacement wording describes.

HB 44 AWS, N.2.2.2. Automatic Tests. - The device shall be tested at the normal operating speed using packages. Test runs should be conducted using at least two test loads distributed over its normal weighing range (e.g., near the lowest and highest ranges in which the device is typically operated.) Each test load should be run a minimum of ten consecutive times.

Pub 14 AWS, 35.1.7. Dynamic tests: The device shall be tested at the highest speed for each weight range using standardized test pucks or packages. Test runs shall be conducted using four test loads as described in Table N.3.2. Each test load shall be run a minimum of 10 consecutive times.

Checkweighers have similar requirements but must be run the number of times as described in N.4.2 (copied below). All those numbers are 10 or greater so “minimum of 10 consecutive times” still works fine for checkweighers.

Table N.4.2 Number of Sample Weights per Test for Automatic Checkweighers

<i>Weighing Range m = mass of test load</i>	<i>Number of Sample Weights per Test</i>
<i>20 divisions $< m < 10$ kg 20 divisions $< m < 22$ lb</i>	<i>60</i>
<i>10 kg $< m < 25$ kg 22 lb $< m < 55$ lb</i>	<i>32</i>
<i>25 kg $< m < 100$ kg 55 lb $< m < 220$ lb</i>	<i>20</i>
<i>100 kg (220 lb) $< m$</i>	<i>10</i>

1 The submitter acknowledged the following potential arguments: The intention is for only four consecutive test runs
2 per test loads. The openness of the wording allows laboratories and inspectors leeway to vary testing as they see fit
3 for that application.

4 The submitter requested Voting status in 2024.

5 **Comments in Favor:**

6 **Regulatory:**

- 7 •

8 **Industry:**

- 9 •

10 **Advisory:**

- 11 •

12 **Comments Against:**

13 **Regulatory:**

- 14 •

15 **Industry:**

- 16 •

17 **Advisory:**

- 18 •

19 **Neutral Comments:**

20 **Regulatory:**

- 21 •

22 **Industry:**

- 23 •

24 **Advisory:**

- 25 •

26 **Item Development:**

27 New Proposal

28 **Regional Associations' Comments:**

29 New Proposal

30 CWMA 2023 Interim Meeting: No comments were heard.

31 The committee recommends this item as developing and seeks input from industry stakeholders.

WWMA 2023 Annual Meeting: During the WWMA 2023 annual meeting the following comments were received:

A question was raised by the WWMA S&T Committee directed to the submitter - the proposed language would seem to bring in repeatability tolerance requirements as at a minimum each test load is to be performed 10 times consecutively, is this the intention? The committee did not receive a response during open hearings.

Mr. Steve Harrington (Oregon Department of Agriculture, Weights and Measures Program): Supports this item for a Voting status.

Mr. Cory Hainy (Representing the SMA): The association has not met on this item and intends to review it in the November 2023 SMA meeting.

Mr. Aaron Yanker (Colorado Dept of Agriculture Weights and Measures): Questioned the language of the types of tests, the definitions per the item, and the reference in Table N.4.2 referring only to the type evaluation and not the entire table. Recommended this item for Developing status.

Mr. Loren Minnich (NIST OWM): The current language as written in existing code is causing confusion on testing the devices and this item is an attempt to clarify that language.

Mr. Kevin Schnepf (California Division of Measurement Standards): Recommends this item be assigned a Developing status with pending review and position from the SMA.

The WWMA 2023 S&T Committee recommends this item be assigned a Developing status to allow the submitter the opportunity to receive input from stakeholders and address comments heard during open hearings. The committee further recommends that these items, AWS-24.2, and AWS-24.3 be Blocked.

SWMA 2023 Annual Meeting: Cory Hainy, SMA, stated they have not met to develop a position on this item.

The committee believes this item has merit regarding clarifying the required number of tests with new language.

The committee recommends this item move forward as a Developing item to allow additional feedback from other stakeholders.

NEWMA 2023 Interim Meeting: No comments were heard on this item and the Committee does not have a recommendation.

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.

AWS-24.2 N.1.6. Influence Factor Testing.

Source:
Marel Ltd.

Purpose:
Remove [influence factor testing conducted statically] section for clarity and consistency across rest of handbook.

Item under Consideration:
Amend Handbook 44 Automatic Weighing Systems Code as follows:

~~**N.1.6. Influence Factor Testing. — Influence factor testing shall be conducted statically.**~~

Previous Status:

2024: New Proposal

Original Justification:

It looks like HB44 was amended in 2004 to mandate automatic testing for automatic machines but this contradicting clause was accidentally left in? See HB 44 AWS N.2 Note, N.2.2.1, and Pub 14 AWS 36 (copied below for convenience).

HB 44 AWS N.2

Note: *If the device is designed for only automatic weighing, it shall only be tested in the automatic weighing mode.*

(Amended 2004)

HB 44 AWS

N.2.2.1. Tests Non-Automatic. – *If the automatic weighing system is designed to operate non-automatically, and is used in that manner, during normal use operation, it shall be tested non-automatically using mass standards. The device shall not be tested non-automatically if it is used only in the automatic mode.*

Pub 14 AWS 36

Influence factor testing shall be conducted:

- *If the device is designed for use in static weighing, it shall be tested statically using mass standards.*
- *If the device is designed for only dynamic weighing, it shall only be tested dynamically.*
- *If the device is designed for static and dynamic weighing, it shall be tested statically and dynamically*

The submitter acknowledged the following potential arguments: Influence factors should be tested statically (more repeatable results not dependent on vibrations, conveyor belt transfers, etc.) and the other sections, for example HB 44 AWS N.2. and Pub 14 AWS 36, should be changed or removed.

The submitter requested Voting status in 2024.

Comments in Favor:

Regulatory:

-

Industry:

-

Advisory:

-

Comments Against:

Regulatory:

-

Industry:

-

Advisory:

-

Neutral Comments:

Regulatory:

-

Industry:

-

Advisory:

-

Item Development:

New Proposal

Regional Associations' Comments:

New Proposal

CWMA 2023 Interim Meeting: No comments were heard.

The committee recommends this item as developing and seeks input from industry stakeholders.

WWMA 2023 Annual Meeting: During the WWMA 2023 annual meeting the following comments were received:

Mr. Cory Hainy (Representing the SMA): The association has not met on this item and intends to review it in the November 2023 SMA meeting.

Mr. Kevin Schnepf (California Division of Measurement Standards): Recommends this item be assigned a Developing status with pending review and position from the SMA.

The WWMA 2023 S&T Committee recommends this item be assigned a Developing status to allow the submitter time to receive input from stakeholders. The committee further recommends that these items, AWS-24.1, and AWS-24.3 be Blocked.

SWMA 2023 Annual Meeting: Cory Hainy, SMA, state they have not met to develop a position on this item.

The committee feels that this item has merit.

The committee recommends this item move forward as a Developing item to allow for additional feedback regarding the use of static influence factor testing for automatic weighing systems.

NEWMA 2023 Interim Meeting: No comments were heard on this item and the Committee does not have a recommendation.

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.

AWS-24.3

N.2.2.3. Shift Test (Dynamic)

Source:

Marel Ltd.

Purpose:

Introduce dynamic shift test for automatic weigh labelers.

Item under Consideration:

Amend Handbook 44 Automatic Weighing Systems Code as follows:

N.2.2.3. Shift Test (Dynamic). - The device shall be tested at the normal operating speed. A test load equal to one-third (1/3) maximum capacity shall be passed over the load receiver or transport belt (1) halfway between the center and front edge a minimum of 10 consecutive times, and (2) halfway between the center and back edge a minimum of 10 consecutive times.

Note: The shift test is not applicable if the device has a means to align packages

Previous Status:

2024: New Proposal

Original Justification:

HB 44 currently only recognizes static shift tests but since automatic weighing systems that are designed to weigh only automatically should only be tested automatically, there should be a method to test the ability of an automatic only machine to cope with off-center loads.

Publication 14 AWS §35.1.8. (copied below for convenience) already describes an automatic/dynamic shift test that has been used many times and is clearly understood by laboratories, inspectors, and manufacturers. By copying this over to HB 44 and adapting the wording slightly, we can better align HB 44 and Pub 14 and reduce confusion and misunderstandings.

Pub 14 AWS

35.1. Static Tests

35.1.1. Increasing-load test...

35.1.2. Decreasing-load test...

35.1.3. Shift test...

35.1.4. Discrimination test...

35.1.5. Zero-load balance change...

35.1.6. Influence factor testing...

35.1.7. Dynamic tests: The device shall be tested at the highest speed for each weight range using standardized test pucks or packages. Test runs shall be conducted using four test loads as described in Table N.3.2. Each test load shall be run a minimum of 10 consecutive times.

35.1.8. Shift Test: To determine the effect of eccentric loading, for devices without a means to align packages, a test load equal to one-third (1/3) maximum capacity shall be passed over the load receiver or transport belt (1) halfway between the center and front edge, and (2) halfway between the center and back edge.

(1)

(2)

The submitter acknowledged the following potential arguments: Testing shift dynamically is available for NTEP laboratories but is intentionally not made a requirement in Handbook 44. Dynamic shift testing is not expected to be carried out during field tests or subsequent evaluations.

The passage is fine but the name should be “Shift Test (Automatic)” as ‘automatic’ is frequently used in HB 44 where ‘dynamic’ is used in Pub 14.

The submitter requested Voting status in 2024.

Comments in Favor:

Regulatory:

-

Industry:

-

Advisory:

-

Comments Against:

Regulatory:

-

Industry:

-

Advisory:

-

Neutral Comments:

Regulatory:

-

Industry:

-

Advisory:

-

Item Development:

New Proposal

Regional Associations’ Comments:

New Proposal

CWMA 2023 Interim Meeting: No comments were heard.

The committee recommends this item as developing and seeks input from industry stakeholders.

WWMA 2023 Annual Meeting: During the WWMA 2023 annual meeting the following comments were received:

Mr. Cory Hainy (Representing the SMA): The association has not met on this item and intends to review it in the November 2023 SMA meeting.

Mr. Kevin Schnepf (California, Division of Measurement Standards): Recommends this item be assigned a Developing status with pending review and position from the SMA.

Mr. Kurt Floren (Los Angeles County, California): Recommend this item be assigned a Developing status. He raised a concern that the existing requirement for a shift test load is 50% of the total scale capacity, he proceeded to question the reasoning behind the change in the shift test load to 1/3 of the total scale capacity.

The WWMA 2023 S&T Committee recommends this item be assigned a Developing status to allow the submitter time to receive input from stakeholders. The committee further recommends that these items, AWS-24.1, and AWS-24.2 be Blocked.

SWMA 2023 Annual Meeting: Cory Hainy, SMA, stated they have not met to develop a position on this item.

The committee feels a separate shift test may not be practical for routine field testing and suggests incorporating the shift test into the existing test procedure.

The committee recommends the item move forward as a Developing item.

NEWMA 2023 Interim Meeting: No comments were heard on this item and the Committee does not have a recommendation.

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.

WIM – WEIGH-IN-MOTION SYSTEMS – TENTATIVE CODE

WIM-23.1 I 2.26 Weigh-in-Motion Systems Used for Vehicle Direct Enforcement

Source:

New York City DOT, C2SMART, Kistler, and Maryland DOT

Purpose:

Provide a legal document that can be used by local and State agencies to certify Weigh-In-Motion (WIM) systems used for automated weight enforcement.

Item under Consideration:

Add Handbook 44 Weigh-In-Motions Systems Used for Vehicle Direct Enforcement Code as follows:

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Section 2.26 Weigh-In-Motion Systems Used for Vehicle Direct Enforcement

A. APPLICATION

A.1. General . – This code 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 vehicle enforcement screening.

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.

1 **S.1.1. Ready Indication. – The system shall provide a means of verifying that the system is operational**
2 **and ready for use.**

3 **S.1.2. Value of System Division Units. – The value of a system division “d” expressed in a unit of**
4 **weight shall be equal to:**

5 (a) **1, 2, or 5; or**

6 (b) **a decimal multiple or submultiple of 1, 2, or 5.**

7 **Examples: divisions may be 10, 20, 50, 100; or 0.01, 0.02, 0.05; or 0.1, 0.2, 0.5, etc.**

8 **S.1.2.1. Units of Measure. – The system shall indicate weight values using only a single unit of**
9 **measure.**

10 **S.1.3. Maximum Value of Division. – The value of the system division “d” for a Class E weigh-in-**
11 **motion (WIM) system (WIM) system shall not be greater than 200 kg or 500 lb.**

12 **S.1.3.1. Number of System Divisions. – The number of system divisions for Class E shall be**
13 **a minimum of 50 and a maximum of 1,000.**

14 **S.1.3.2. Minimum Capacity. – The minimum capacity in system divisions for Class E shall be**
15 **10.**

16 **S.1.4. Value of Other Units of Measure.**

17 **S.1.4.1. Speed. – Vehicle speeds shall be measured in miles per hour or kilometers per hour.**

18 **S.1.4.2. Axle-Spacing (Length). – The center-to-center distance between any two successive**
19 **axles shall be measured in:**

20
21 (a) **meters and decimal submultiples of a meter;**

22 (b) **feet and inches; or**

23 (c) **feet and decimal submultiples of a foot.**

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

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

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

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

- (b) The maximum number of vehicle axles as specified has been exceeded.
- (c) A change in vehicle speed greater than that specified has been detected.
- (d) Imbalanced weight between the left and right wheels has exceeded the specified values.
- (e) Vehicle has changed lanes between or in the proximity of the first and the last sensors.
- (f) Any axle or wheel, or part of each is not on the load-receiving element of the sensors.
- (g) Vehicle direction of travel is not valid for the installation.

S.1.7. Recorded Representations.

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

- (a) transaction identification number;
- (b) station ID;
- (c) lane identification (required if more than one lane at the site has the ability to weigh a vehicle in motion);
- (d) vehicle speed;
- (e) number of axles;
- (f) weight of each axle;
- (g) identification and weight of axle groups;
- (h) axle spacing;
- (i) gross vehicle weight;
- (j) total vehicle length;
- (k) all fault conditions that occurred during the weighing of the vehicle, as identified in paragraph S.1.6. Identification of a Fault;
- (l) violations, as identified in paragraph S.2.1. Violation Parameters, which occurred during the weighing of the vehicle; and
- (m) time and date.

Note: Consult the specific jurisdictional legislation for additional values that may be required to issue enforcement violations. All gross vehicle, axle, and axle group weights must be printed and/or stored with the corrected values that include any necessary reductions due to the system tolerance and adopted violation thresholds. Violation thresholds may be dependent on additional items, not specified in this code.

1 **S.1.8. Value of the Indicated and Recorded System Division.** – The value of the system’s division
2 “(d),” as recorded, shall be the same as the division value indicated.

3 **S.2. System Design Requirements.**

4 **S.2.1. Violation Parameters.** – The instrument shall be capable of accepting user-entered violation
5 parameters for the following items:

- 6 (a) single axle weight limit;
7 (b) axle group weight limit;
8 (c) gross vehicle weight limit; and
9 (d) bridge formula maximum.

10 The instrument shall display and/or record violation conditions when these parameters have been
11 exceeded.

12 Note: Jurisdiction-defined weight limits for S.2.1 Violation Parameters (a) through (d) can be used to determine the
13 violation.

14 **S.3. Design of Weighing Elements.**

15 **S.3.1. Multiple Load-Receiving Elements.** – An instrument with a single indicating or recording
16 element, or a combination indicating-recording element, that is coupled to two or more load-receiving
17 elements with independent weighing systems, shall be provided with means to prohibit the activation of
18 any load-receiving element (or elements) not in use, and shall be provided with automatic means to indicate
19 clearly and definitely which load receiving element (or elements) is in use.

20 **S.4. Design of Weighing Devices, Accuracy Class.**

21 **S.4.1. Designation of Accuracy.** – WIM systems meeting the requirements of this code shall be
22 designated as accuracy Class E.

23 Note: This does not preclude higher accuracy classes from being proposed and added to this Code in the future
24 when it can be demonstrated that weigh-in-motion systems grouped within those accuracy classes can achieve the
25 higher level of accuracy specified for those devices.

26 **S.5. Design of Balance**

27 **S.5.2. Zero-Tracking Device.** – A zero-tracking device shall have a range of 4% of the system
28 capacity and operate only when:

- 29 (a) the system is in a no-load condition;
30 (b) is in stable equilibrium; and
31 (c) the corrections are not more than 0.5 d per second; and

32 **S.5.3. Totalizing Device.** – A WIM system may be provided with a totalizing device for
33 determining gross vehicle weight which operates:

(a) automatically, in which case the instrument shall be provided with a vehicle recognition device defined in S.5.4. Vehicle Recognition/Presence Device; or

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

S.5.4. Vehicle Recognition/Presence Device. – WIM system which are able to operate without the intervention of an operator shall be provided with a vehicle recognition device. The device shall detect the presence of a vehicle in the weigh zone and shall detect when the whole vehicle has been weighed. WIM system shall not indicate or print the vehicle mass unless all wheel loads of the vehicle have been weighed.

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

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

(a) accuracy class;

(b) value of the system division “d”;

(c) operational temperature limits;

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

(e) minimum and maximum vehicle speed;

(f) maximum number of axles per vehicle;

(g) maximum change in vehicle speed during weighment;

(h) minimum and maximum load; and

(i) any restrictions specified in the NTEP Certificate of Conformance.

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

N. NOTES

N.1. Test Procedures.

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

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

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

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

(d) The gross vehicle weights shall be as stated in N.1.2.2. *Dynamic Test Loads*.

Note 1: Consideration should be made for testing the system using vehicles which are typical to the roadway in which the system is installed if different than the types listed in (a) through (c) above.

Note 2: If the WIM system will be used to enforce the weight limit for vehicles with liquid loads, a vehicle with a liquid load shall be included in the selection of test vehicles.

N.1.1.1. Weighing of Test Vehicles. – All test vehicles shall be weighed statically on a reference scale, meeting the requirements of Appendix A, before being used to conduct dynamic tests.

N.1.1.2. Determining Reference Weights for Axles, Axle Groups, and Gross Vehicle Weight. – The reference weights shall be the average weight value of a minimum of three static weighments of all single axles, axle groups, and gross vehicle weight on a reference scale before being used to conduct the dynamic tests.

Note: The axles within an axle group are not considered single axles.

N.1.2. Test Loads.

N.1.2.1. Static Test Loads. – All static test loads shall use certified test weights.

N.1.2.2. Dynamic Test Loads. – Test vehicles used for dynamic testing shall be loaded as specified below. Except when testing for liquid loads, the “load” shall be non-shifting and shall be positioned to present as close as possible, an equal side-to-side load.

(a) a half load condition (60-80% of the legal load limit of the test vehicle) for a minimum of 10 runs per test vehicle type;

(b) a full load condition (> 85% 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 or a single-platform vehicle scale.

The scale shall be tested prior to using it to establish reference test loads per direction from the jurisdiction and in no case more than 4 weeks prior. To qualify for use as a suitable reference scale, it must meet NIST Handbook 44, Class III L maintenance tolerances

N.1.3.1. Multi-Platform Vehicle Scale. – It is comprised of three individual weighing/load-receiving elements, each an independent scale. 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. Single-Platform Vehicle Scale. – Each individual axle or axle group of the reference test vehicles shall be measured on the single platform vehicle 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. Location of a Reference Scale. – The location of the reference scale must be considered since vehicle weights will change due to fuel consumption.

N.1.4. Test Speeds. – All dynamic tests shall be conducted at two designated speeds.

(a) at a high speed – posted speed limit (Vmax); and

(b) at a low speed – site-specific minimum speed, not below manufacturer’s requirement (Vmin).

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.1.5.

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.2.3. Maintenance Tolerances for Accuracy Class E.

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.1.5.1. Dynamic Load Test.

See Table N.1.6 below to summarize the minimum number of test runs.

Table N.1.6 Minimum Number of Test Runs per Each Test Vehicle	
<u>Load Condition</u>	<u>Speed</u>
<u>Half Load (10 runs)</u>	<u>High Speed Vmax (5 runs)</u>
	<u>Low Speed Vmin (5 runs)</u>
<u>Full Load (20 runs)</u>	<u>High Speed Vmax (10 runs)</u>
	<u>Low Speed Vmin (10 runs)</u>

N.1.6.2. 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 vehicle scale is a performance requirement independent of the design principle used.

T.2. Tolerance Values for Accuracy.

T.2.1. Acceptance Tolerance. – Acceptance tolerance shall be 50% of tolerances in Table T.2.3. Maintenance Tolerances for Accuracy. The acceptance tolerance shall apply to a new installation or within 30 days of a new installation being placed in service or when an existing system undergoes major reconditioning or overhaul.

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. for direct enforcement purposes.

Table T.2.3. Maintenance Tolerances for Accuracy	
<u>Load Description*</u>	<u>Tolerance as a Percentage of Applied Test Load</u>
<u>Axle Load</u>	<u>± 20 %</u>
<u>Axle Group Load (including bridge formula)</u>	<u>± 15 %</u>
<u>Gross Vehicle Weight</u>	<u>± 10 %</u>
<u>* All weight readings shall be 100% in compliance.</u>	

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 Tolerance for Accuracy 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 Tolerance for Accuracy 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 for Accuracy.

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, or verification system division, and minimum capacity.

UR.1.1. General. – The typical class or type of device for particular weighing applications is shown in Table 1. Typical Class or Type of Device for Weighing Applications.

<u>Table 1.</u> <u>Typical Class or Type of Device for Weighing Applications</u>	
<u>Class</u>	<u>Weighing Application</u>
<u>E</u>	<u>Enforcing of vehicles based on axle, axle group, and gross vehicle weight.</u>

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.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 user shall ensure compliance with specific jurisdictional legislation and/or protocols. 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.

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]

W

weigh-in-motion (WIM). – A process of estimating 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; estimate 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 Action:

2023: New Item

Original Justification:

1. INTRODUCTION

The Brooklyn-Queens Expressway (BQE) is an aging and deteriorating 6-lane highway which comprises a critical link of I-278 - the sole Interstate highway in Brooklyn, connecting it to Manhattan, Staten Island, and Queens in New York. Constructed in 1954 and comprised of varying and complex structure types, the segment of the BQE between Atlantic Ave. Interchange to the South and Sands St. to the North is nearing the end of its design life. Urgent repairs are underway, while roughly 110 spans may be in need of intervention by 2028, and

another 75 spans may be in need of intervention within the next decade. Weigh in Motion (WIM) sensors, installed in October 2019, have revealed overweight vehicles, excessively exceeding FHWA legal load limits, with gross vehicle weights (GVW) that range from just over 80,000 lbs to as high as 200,000. The continued presence of overweight vehicles on the BQE contributes to the continued structural deterioration of this aging piece of infrastructure. The New York State legislature recently authorized the New York City Department of Transportation to conduct automated overweight vehicle enforcement through a WIM demonstration program; however, a universal standard has not yet been established that specifically defines a protocol for calibration and certification by the New York State local Division of Weights and Measures.

In response to this challenge, this proposal seeks an amendment of Section 2.25 of NIST Handbook 44 to allow for Weigh-In-Motion Systems Used for Automated Vehicle Weight Enforcement. The remainder of this proposal lays out the justification for the amendment, using the BQE as an example to establish the urgent need for the amendment, supported by data received from other State programs, including New Jersey, Maryland, and Indiana. The City of New York is not alone in its struggle to maintain the safety and the structural integrity of its infrastructure. Guarding against violations of vehicle weight restrictions that are enacted to protect critical infrastructure is an issue of national concern.

The combined interstate data presented here stresses the national importance of establishing protocols for automated vehicle weight enforcement using WIM, citing:

- the deleterious effects of overweight vehicles and axles on primary structural components and pavements;
- the difficulty associated with the use of screening combined with stationary weighing stations to enforce vehicle weight regulations;
- the percentages of overweight vehicles on major interstates across the nation; and
- the proven accuracy of WIM equipment used in several states across the nation.

2. THE BROOKLYN-QUEENS EXPRESSWAY: THE NEED FOR URGENT INTERVENTION

Constructed in 1954, the BQE is a network of varying and complex structure types, including multi-girder steel bridges, concrete arch bridges, and double and triple concrete cantilever structures. The triple-cantilever section possesses unusual engineering characteristics. Its three levels of cantilevered structure (comprised of two levels of vehicular roadway and a top-level pedestrian Brooklyn Heights Promenade) are supported by a vertical wall that also serves to hold back the earth, and, in turn, the neighborhood of Brooklyn Heights behind it. Thus, there is a complex system of forces acting to hold up the cantilevered decks and soil, and moving one of its parts affects the others. With major structural components nearly 70 years old, this segment of the BQE is rapidly approaching the end of its design life. Due to its complex nature and its historic integration with the surrounding communities, repair and replacement of this segment of the BQE requires careful and strategic planning, exhausting every avenue to maintain the safety of its operations and the integrity of its structural condition.

Its aging characteristics are evidenced by a number of factors, including:

- Visible signs of deterioration, including scaling, efflorescence, transverse cracking, map cracking, and spalling, with exposed and corroded rebar at the underdeck, walls, and substructure components;
- Poor freeze-thaw results in the concrete cores;
- High chloride levels in the deck, leading to the onset and propagation of steel rebar corrosion in the structural decks and substructure components;
- Deteriorated concrete beneath the surface, as detected by Non-Destructive Test and Evaluations (NDT/E) and verified by probe samples; and

- Projected decreases in structural load ratings to below standard limits, with isolated segments projected to fall below standard limits by 2026, and large segments of this portion of the corridor projected to fall below standard limits by 2028.

Numerous traffic studies have been completed for this segment of the corridor, revealing average daily traffic (ADT) of approximately 153,000 vehicles, including a substantial average daily truck traffic (ADTT, up to 13 percent of the total ADT). In addition, the installation of WIM sensors in October 2019 has revealed that a considerable number of the vehicles traversing the BQE are classified as overweight, when compared with FHWA legal load limits. WIM data shows Gross Vehicle Weights ranging from just over 80,000 lbs to as high as 200,000 lbs, with roughly 20% of North-bound traffic classified as overweight, and roughly 8% of South-bound traffic classified as overweight.

The New York City Mayoral Executive Order 51, executed in January 2020, mandated the formation of the New York City Police Department (NYPD) BQE Truck Enforcement Task Force, whose purpose is to ensure that all existing weight restrictions on the BQE are strictly enforced. However, the lack of roadway shoulders on this stretch of the BQE means that there is insufficient space for the New York City Department of Transportation (NYCDOT) to introduce stationary weighing stations, or for NYPD enforcement officers to pull over overweight vehicles and use portable scales to screen and enforce legal weight limits.

Urgent repairs are currently underway for two spans within this complex network, while structural assessments show that roughly 110 spans may be in need of intervention by 2028, and roughly 75 spans may be in need of intervention within the next decade.

In response to this challenge, NYCDOT has initiated aggressive efforts to develop and implement a plan that maintains the operational safety of the BQE, as well as protects its structural integrity, including the pursuit of automated weight enforcement using WIM on this segment of corridor. It has combined its efforts with other local and State agencies in order to demonstrate that this is not an isolated local problem, but a national need.

3. AUTOMATED TRUCK ENFORCEMENT USING WIM: THE NATIONAL NEED

The national roadway infrastructure, including bridges and pavement, has handled substantial daily truck traffic. While trucks have been an integral part of the freight movement network in distributing goods and services to various communities, many trucks are often found to be overweight beyond the FHWA legal load limits. Illegally overweight vehicles have been shown to be one of the primary causes of the deterioration of aging pavement and bridges. Accordingly, the infrastructure suffers from significant deterioration because of the existing environmental conditions exacerbated by the frequently increasing and substantial number of overweight vehicles.

Vehicles on Interstate highways must conform to the Federal Bridge Formula (FBF), designed to protect bridges from vehicle overloads beyond the legal limits. To date, the enforcement regulations have been executed at stationary weighing stations across the nation, especially at the borders between states. However, the stationary stations have limited resources for effective enforcement because: (1) the number of stationary weighing stations is not spatially well distributed across the nation; (2) the operation hours are limited; and (3) the number of enforcement officers is insufficient.

Though each state allows a certain number of permitted vehicles to exceed the FHWA weight limits on Interstate Highways, the number of permit overweight vehicles is typically a small fraction of the total. According to a previous study (Nassif et al., 2016)¹, the number of permit overweight vehicles is only 4% of the total overweight vehicles observed at NJ WIM stations. In New Jersey, it was also noticed that the overweight vehicles cited at the stationary weighing stations were only a small fraction (6.4%) of the *actual* overweight populations recorded by the WIM sensors on the main lanes, and this is, in turn, 0.142% of the total number of

¹ Nassif, H., K. Ozbay, H. Wang, R. Noland, P. Lou, S. Demirogluk, D. Su, C.K. Na, J. Zhao, and M. Beltran. Impact of freight on highway infrastructure in New Jersey. Final Report FHWA-2016-004, NJDOT, 2016

vehicles (Nassif et al., 2021)². In New York City, enforcement officers have been able to cite only 14.7% of the *actual* number of overweight vehicles on and near Interstate Highway I-278 between February and December of 2021. Therefore, the overweight enforcement practices at the stationary weighing stations, combined with using mobile enforcement units, are ineffective in substantially reducing the percentage of overweight vehicles.

The figure below summarizes the percent of overweight vehicles, relative to the ADTT for each US State. The overall overweight percentage out of ADTT is 13.2%, based on the data in the figure below.

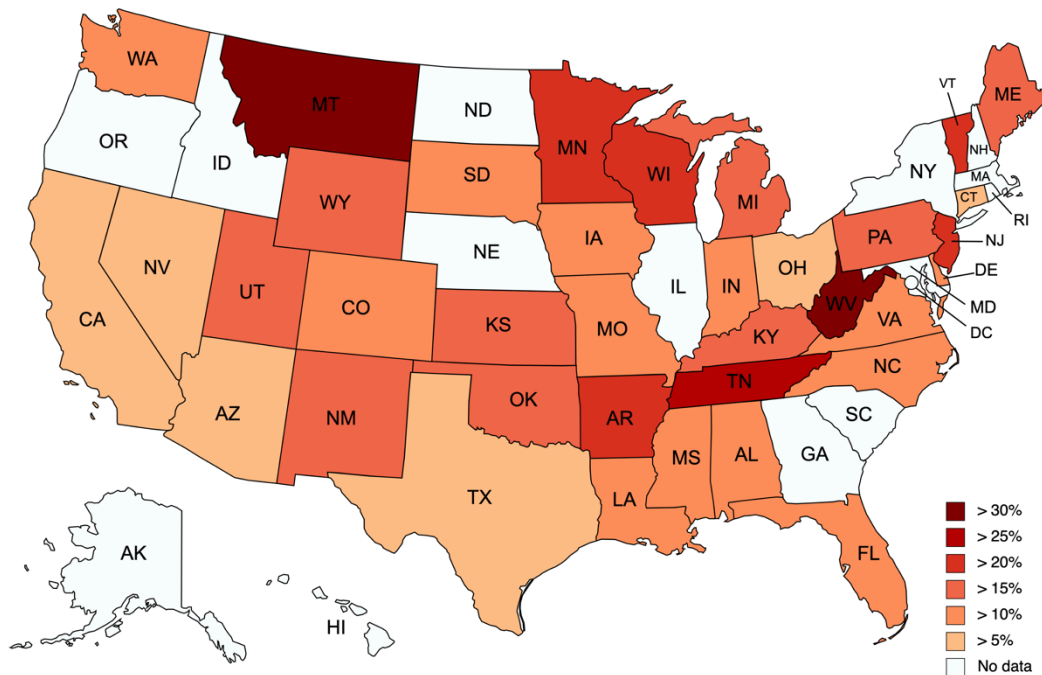


Figure 1. Overweight percentage per State

Going beyond weight enforcement, 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. The highest level of inspection, Level 1, has 20+ safety criteria that an officer checks on a CMV. There is an opportunity with automated weight enforcement to, not only deter overweight vehicles on the nation's infrastructure, but to automate the inspection tasks of officers, freeing them up so they can do more inspections for other safety issues related to CMV's. 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 until an officer can complete their task.

4. AUTOMATED TRUCK ENFORCEMENT USING WIM: PROVEN ACCURACY OF WIM TECHNOLOGY

ASTM E1318-09 Type III accuracy requirements have been used by many States in their fixed and virtual weigh stations to screen CMV's for over a decade. In New York, three calibration tests were performed using various trucks (Class 9, Class 7, Class 6, and Class 5), and it was found that the WIM system could provide 100% compliance for GVW within 6%, single axle weight within 15%, tandem axle weight within 10%, and

² Nassif, H., K. Ozbay, C.K. Na, and P. Lou. Feasibility of Autonomous Enforcement using A-WIM system to Reduce Rehabilitation Cost of Infrastructure, C2SMART Tier 1 University Transportation Center, Year 3 Final Report, 2021

1 even wheel weight within 20%. In Indiana, the Indiana DOT and Purdue University studied the accuracy of the
2 virtual WIM sensors on the main lanes compared to the stationary weighing station. They found that 98% of
3 the virtual WIM weights were within 5% of the static weights.
4

5 Attachment A includes data from New York, Indiana, and Maryland, proving the accuracy of their WIM
6 technology. Additionally, Wisconsin, and two other States have expressed interest in sharing data from their
7 sites which meet these accuracy requirements.
8

9 Given the consistent accuracy of WIM measurements, compared with measurements obtained from the
10 stationary scales, the amendment of Handbook 44 to expand its provisions for screening to include automated
11 vehicle weight enforcement using WIM is both prudent and justified.

12 **5. CONCLUSIONS**

13 Across the nation, the deterioration of aging infrastructure is exacerbated by the presence of overweight
14 vehicles in excess of the Federal Bridge Formula (FBF). Though several states have implemented vehicle
15 weight enforcement measures using a screening protocol that includes the use of mobile enforcement officers
16 and stationary scales, these measures have been insufficient in significantly reducing the volumes of overweight
17 vehicles on the nation's infrastructure. The use of WIM for the purposes of automated vehicle weight
18 enforcement would both alleviate this problem and free up local and state resources to address other safety
19 concerns. However, to date, no unified national standard specifically paves the way for the certification of
20 WIM technology to be used for the purposes of automated vehicle weight enforcement. The amendment of
21 Section 2.25 of NIST Handbook 44 will provide such a standard. With several states evidencing the proven
22 accuracy of current WIM technology, the amendment of Section 2.25 to expand its screening provisions to
23 include automated vehicle weight enforcement using WIM is both prudent and justified.

24 This request is not to introduce new regulations to the trucking industries but to guide the trucking industries to
25 comply with the applicable laws to protect our infrastructure, provide safe corridors to the nation's taxpayers, and
26 improve the resilience of our built environment. Moreover, this request would allow the United States to catch up
27 with other countries globally that have successfully implemented and proved automated weight enforcement,
28 including China (2004), the Czech Republic (2010), Russia (2013), Hungary (2016), France (in process) and Brazil
29 (in process).

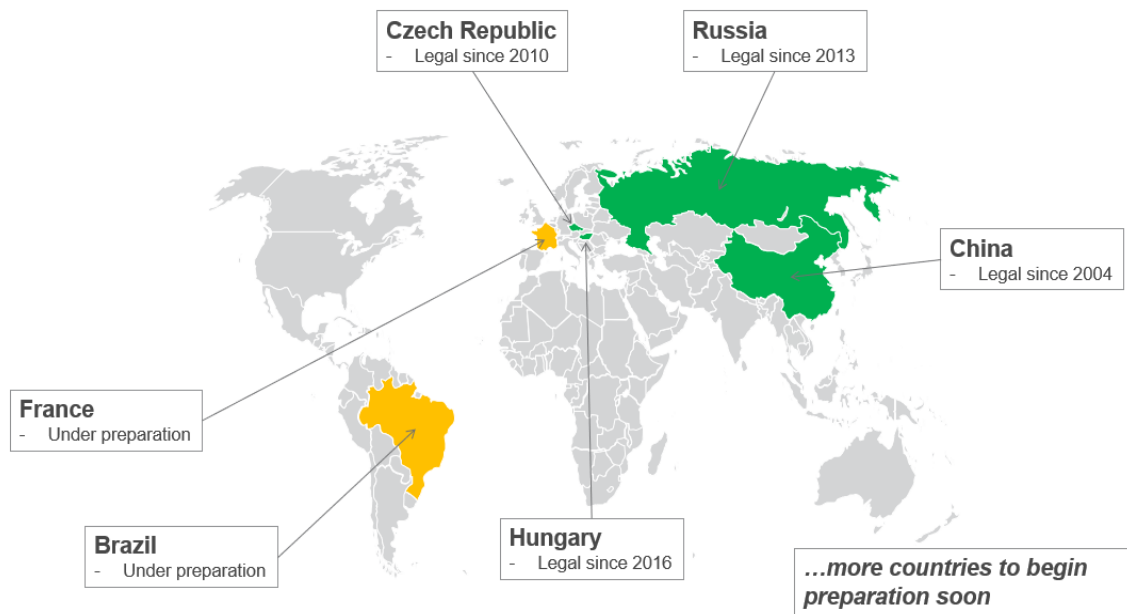


Figure 2. Automated enforcement around the world

The submitters requested that this be a Voting item in 2023.

Comments in Favor:

Regulatory:

- Interim 2023: Doug Musick (State of Kansas) commented as to the original intent was for screening and now to become enforcement. Supports developmental status as the tolerances are not fully understood.
- Interim 2023: Tim Chesser (State of Arkansas) commented that he supports removing the tentative status for screening and that a set procedure for testing is missing from the proposal. This cannot be guesswork. Recommended Developmental status.
- Annual 2023: The State of New York commented they had attended a demonstration of the WIM system in Wisconsin and was confident with the resulting test data.

Industry:

- Interim 2023: Tanvi Pandya (NYC DOT- Submitter) gave a brief overview of the deteriorating infrastructure issue on the Bronx Queens Expressway in NYC and this proposal seeks to remove the tentative status of the WIM proposal and establish testing standards for the automated enforcement of weight infractions.
- Interim 2023: Jess Helmlinger from Kistler gave a brief presentation. Commented also that this application is to increase efficiency vs accuracy and the tolerances proposed allow for the tolerance to be taken into account.
- Interim 2023: Russ Vires (SMA) recommended to remove the tentative status and use this code as originally intended for screening.
- Annual 2023: The submitters of the proposal gave a presentation with the July 2023 updates to their proposal that appeared on the NCWM website.

Advisory:

- Interim 2023: Jan Konijnenburg (NIST OWM) supports this item, but item is not ready for a vote yet. This application is for situations that do not allow for static scales.
- Annual 2023: NIST OWM commented that this proposal has come a long way in a short amount of time. NIST does not share the concerns of the SMA. This system is a law enforcement application, not commercial, and they can't be compared.

Comments Against:

Regulatory:

- Interim 2023: Vince (State of Arizona) commented that the notes are confusing and needs work.
- Annual 2023: The State of California commented that the newest version of the submitters proposal that appeared on the NCWM website had not been reviewed as of this meeting, however, there could be issues with creating a wider tolerance for dynamic scales.

Industry:

- Annual 2023: The SMA commented that they oppose this item as highway enforcement scales are currently listed as Class III and dynamic scales should not have a greater tolerance.

Advisory:

- None

Neutral Comments:

Regulatory:

- None

Industry:

- None

Advisory:

- None

Item Development:

NCWM 2023 Interim Meeting: The committee has updated this item to the latest version received from the submitter. In the most recent version of the proposal, the submitters changed N.1.3. to require the reference scale be tested no more than 2 weeks prior to the test of the WIM scale, instead of 24 hours. The committee does not agree with this change and has decided to leave it as currently written in Handbook 44. The committee continues to work on this item, including User Requirements, to address concerns it heard during the Interim. The submitters intend to provide a demonstration of a WIM scale in use in the near future. The committee has decided to leave the item as informational and encourages the submitters to continue to work with the committee, NIST OWM, and stakeholders for further development.

NCWM 2023 Annual Meeting: The committee used the updated (7/11/23) proposal from the submitters as a basis for the current item under consideration, but with changes in the following sections: S.1.6, N.1.1.2 Note 1, N.1.2.3 (a), N.1.3., N.1.4., Table N.1.5., N.1.6.1., T.2.4., and UR.4., and removed N.1.5.4.. The committee also believes that N.1.3 needs to better clarify the use of "single platform vehicle scale". As written, it currently promotes split weighing, or could be confused with the use of axle-load scales. The committee encourages the submitters to continue to work with the committee, NIST OWM and other stakeholders to further develop this item.

Regional Associations' Comments:

CWMA 2023 Interim Meeting: Tanvi Pandya and Chaekuk Na presented on behalf of the submitters outlining the changes that have been made to address previous concerns.

Mike Harrington from Iowa supports this item and recommends it moving forward as voting.

Greg VanderPlaats from Minnesota commented that the submitters have done a lot of work and have made changes per the feedback received at the National Conference. He supports this item as voting.

The committee recommends this item moving forward as a voting item with the proposed changes by the submitter which are attached to the end of this report. [APPENDIX B]

WWMA 2023 Annual Meeting: During the WWMA 2023 annual meeting the following comments were received:

A presentation was given from the submitters of this item regarding updated language provided for consideration and posted on the WWMA website {Events – Meeting Documents – WIM.23-1} Proposed Language. The submitters spoke to:

- This device is not a scale in the traditional application and intended for use dynamically of overweight vehicle enforcement.

- The intent is to remove the “Tentative” status for Class E devices. The “Tentative” status would remain for Class A devices.

- A demonstration was conducted on a similar device in April 2023.

- This application would exclude all liquid tank trucks.

- It is difficult to be consistent with vehicle positioning. The submitter clarified that if the vehicle is not in the correct position the system will default to “Error”. This “Error” is an appropriate performance function.

Mr. Cory Hainy (Representing the SMA): The association formed a position in April 2023 of opposition to this item prior to the updated language being proposed and will meet in November 2023 to reassess the item. It was reemphasized that the proposed tolerances were a point of contention with the association. The association would like to see revisions that address dynamic weighing should not be allowed a greater tolerance, acceptance and maintenance tolerances should be applied, and harmonizing existing tolerances with the scale code.

Mr. Loren Minnich (NIST OWM): OWM reached out to the submitter to clarify the intention regarding tentative and permanent status for “Class A” and “Class E” devices subject to this code. Examples were provided in open hearing of existing code such as Grain Analyzers as an example of separating this code for enforcement and screening purposes.

The WWMA S&T Committee posed the following questions:

- Can the submitter clarify the intent of all weights for 100% compliance regarding the applicable tolerances?

The submitter response clarified the device should perform within the applicable tolerances at all test loads and that a fault qualifies towards the 100% compliance.

- Can the submitter clarify what is meant by 100% compliance regarding T.2.4?

The submitter clarified that the axle spacing must be predetermined by the inspector and must match the device. The system will identify a bridge formula violation and the inspector has to accurately measure the axle spacing and then verify the system measurement within the tolerance specified with T.2.4

- 1 - Can the submitter provide data to support the +/- 10% to 20% tolerance range?

2 The submitter response clarified the intent of the use of the device is for dynamic and not static weighment.
3 Scales currently function at a lower range of 6% but the addition of the 100% compliance is to justify the
4 tolerance. It was expressed that the intention of the proposed code is to enforce grossly overweight
5 vehicles.

6 The submitter clarified that the 100% compliance came from the original proposed 95% compliance. The
7 submitter clarified 100% of the total number of runs would need to be within tolerance.

- 8 - Can the body please clarify how or if 2.20 scale code regarding WIM systems and the proposed WIM
9 system code will impact each other?

10 Mr. Loren Minnich (NIST OWM) clarified each section of the existing code has an application section to
11 identify what devices are covered by that code. The application section for each code should be reviewed to
12 verify that there is no overlap.

13 Mr. Cory Hainy (Representing the SMA): Raised concern regarding tolerances specifically whether OIML R 134-1
14 standards were considered.

15 Mr. Chaekuk Na (Rutgers University): OIML 134-1 standards were considered and further clarified there are
16 different levels of accuracy. The tolerances selected are currently being used in other countries, the F-10 for 10%
17 gross meet the proposed tolerances.

18 Mr. Cory Hainy (Representing the SMA): Reinforced the concern regarding the large tolerances and spoke to
19 already existing tolerances. Existing scales are held to certain standards even if used for law enforcement purposes.

20 Ms. Tanvi Pandya (New York City DOT): Clarified this is a dynamic test and supports the tolerances as written.

21 Mr. Aaron Yanker (Colorado Dept. Ag Weights and Measures): Questioned the note in Table 1 regarding the
22 comment of additional accuracy classes. The submitter responded that the language in the note of Table 1 is carry
23 over language of the item from its original draft.

24 The WWMA S&T Committee recommends that the NCWM S&T Committee consider incorporation of the updated
25 language as provided by the submitter and that this item remain Informational. This will allow stakeholders to
26 provide comments on the updated language. We further recommend that NCWM S&T Committee consider the
27 comments and questions which came up in the WWMA S&T open hearing session while further developing the item
28 with special attention to the comments from NIST OWM.

29 The proposed updated language will be included in the WWMA S&T Committee 2023 Final Report as an Appendix
30 to the item.

1 SWMA 2023 Annual Meeting: Tanvi Pandya, NYCDOT, co-submitter, gave a presentation on the item. She has had
 2 some edits since the July report. She stated these systems are used internationally, and it isn't realistic to statically
 3 weigh the 10% of all trucks that are overweight on the road. She feels the tolerance is acceptable for enforcement
 4 purposes. She stated that this device is to be used for law enforcement and screening purposes only and not commercial
 5 applications. She noted some jurisdictions have raised concerns to her about removing the tentative status. She also
 6 stated that she hasn't had a chance to resolve some issues with NIST, and that the New York Department of Agriculture
 7 is requiring a corresponding code in Handbook 44 before they will certify the weighing system.

8 Chaekuk Na, Rutgers University, co-submitter, stated they are trying to harmonize the language in the item with the
 9 OIML code. Mr. Na stated fuel consumption of the test vehicle is not relevant due to the large tolerances allowed in
 10 their current code.

11 Cory Hainy, SMA, stated they are opposed to the item and have not had a chance to review the latest revision. SMA
 12 stated that they are concerned that enforcement scales are already defined, acceptance and maintenance tolerances
 13 have not already been established, and that adding it to the WIM code will create two conflicting law enforcement
 14 codes. The specifics of their concerns are in their April positions from SMA.

15 Tim Chesser, Arkansas, echoed Mr. Hainy's position and asked what other states besides New York and Maryland
 16 plan to use this code? He also raised a concern that once this code is in the handbook some states would be forced to
 17 enforce it. He also stated the tolerances were too wide for enforcement. He also expressed concern about the axle
 18 spacing measurement being confusing.

19 Alison Wilkinson, Maryland, raised concerns about the lack of standards, the use of the word "may", and stated the
 20 reference scale code is vague in regard to testing logistics such as how far or near the reference scale should be to the
 21 system being tested. She also raised concerns about the fuel consumption of the test vehicles. She stated the state of
 22 Maryland is opposed to this item, and that she agrees with Tim Chesser's comments. She believes this code should
 23 only be used for screening.

24 Mauricio Mejia, Florida, agreed with the concerns raised by other commenters, questioned whether this is the proper
 25 channel for this type of code, and that it should only be used for gross vehicle weight.

26 Juana Williams, NIST OWM, has concerns about combining tentative and non-tentative codes. She stated NIST OWM
 27 is of the opinion that acceptance tolerance should be 50% of the maintenance tolerance. She also stated that this code
 28 should cover all vehicles, including those carrying liquids and empty vehicles.

29 John Stokes, South Carolina, agreed with Arkansas in opposition to the item.

30 Robert Huff, Delaware, stated this item will result in numerous complaints that they will not be able to handle.

31 The committee heard no comments in support of this item from the SWMA membership and suggests that the NCWM
 32 S&T committee work with the submitters and NIST to address the issues raised.

33 The committee recommends the item remain as an Informational item.

34 NEWMA 2023 Interim Meeting: A presentation was made by submitters with updates to the item, including having
 35 2.25 remain tentative for screening and creating 2.26 for enforcement. The submitters are working with NIST to
 36 finalize language and the updated proposal after taking feedback from the regions. The State of NY recommends
 37 voting. The Commonwealth of PA questions if it should be in the handbook. The States of New Hampshire, New
 38 Jersey, and the Commonwealth of Massachusetts supports as voting. Upon consensus of the body, the Committee
 39 recommends this item be Voting with the upcoming changes to the item.

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

LMD – LIQUID MEASURING DEVICES

LMD-24.1 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 Liquid Measuring Devices Code as follows:

N.4. Testing Procedures.

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 flow rates down to and including one-half of the sum of the maximum discharge flow rate and the rated minimum discharge flow rate shall be considered normal tests.

(Amended 1991)

Example:

- Maximum rated flow rate is 12 gpm / Minimum rated flow rate is 0.5 gpm.
- Maximum discharge flow rate developed under conditions of installation is 9 gpm = normal test
- Additional normal tests are determined using the following formula:
$$\frac{\text{Max discharge flow rate} + \text{rated min discharge flow rate}}{2} = \text{minimum discharge flow rate}$$
- In this example $\frac{9 \text{ gpm} + 0.5 \text{ gpm}}{2} = 4.75 \text{ gpm}$. Therefore, flow rates of 9 gpm down to and including 4.75 gpm are considered normal tests.

Previous Status:

2024: New Proposal

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:

-

Industry:

-

Advisory:

-

Comments Against:

Regulatory:

-

Industry:

-

Advisory:

-

Neutral Comments:

Regulatory:

-

Industry:

-

Advisory:

-

Item Development:

[Explain any changes made to the original proposal and committee recommendations]

Regional Associations' Comments:

This item was only introduced to NEWMA in Fall 2023.

NEWMA 2023 Interim Meeting: A regulator from New Hampshire commented that the test procedure, as currently written, is difficult to understand, specifically in the second sentence. The purpose of the proposal is to add an equation and give an example of the equation, adding a value and clarity to the handbook. The State of New York commented that other codes, such as LPG, has the same language and may also need to be updated in the future but agrees the proposal has merit. The Commonwealth of Pennsylvania commented that clarity is an added advantage in the field and makes a difference to help regulators and industry understand the testing methods. It was also suggested that if this does not appear in the handbook, then it could possibly be worked into the NCWM field testing manual. The State of New Jersey concurs. Upon consensus of the body, the Committee recommends this item as a voting 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.

VTM – VEHICLE TANK METERS

VTM-20.2 A Table T.2. Tolerances for Vehicle Mounted Milk Meters.

NOTE: This item was revised based on changes that were made by the Committee at the 2021 Interim Meeting. The item under consideration was removed from the voting consent calendar at the 2021 Annual Meeting and the S&T Committee made this a developing item.

Source:

POUL TARP A/S

Purpose:

Change tolerances to accommodate more efficient milk-metering systems.

Item Under Consideration:

Amend Handbook 44, Vehicle-Tank Meters Code as follows:

T.2. Tolerance Values. – Tolerances shall be as shown in Table 1. Accuracy Classes and Tolerances for Vehicle-Tank Meters Other Than Vehicle-Mounted Milk Meters and Table 2. Tolerances for Vehicle-Mounted Milk Meters. (Amended 1995, 20XX)

Table 2. Tolerances for Vehicle-Mounted Milk Meters		
Indication (gallons)	Maintenance Tolerance (gallons)	Acceptance Tolerance (gallons)
100	0.5	0.3
200	0.7	0.4
300	0.9	0.5
400	1.1	0.6
500	1.3	0.7
Over 500	Add 0.002 gallon per indicated gallon over 500	Add 0.001 gallon per indicated gallon over 500

(Added 1989)

Table 2. Tolerances for Vehicle-Mounted Milk Meters		
	Acceptance Tolerance	Maintenance Tolerance
Complete Measuring System	0.5%	0.5%
Meter Only	0.3%	0.3%

(Amended 20XX)

Background/Discussion:

A Milk Meter Tolerance Task Group was formed and assigned to this item. Please contact the task group chair for more information:

To Be Determined

Milk Meter Tolerance Task Group
Phone, Email

Existing tolerances are based on the accuracy of the Flow meter itself. The proposed Tolerances are based on Milk Metering Systems where the magnetic flow meter is a part of the Milk Metering system handling milk containing air.

The accuracy of the Flow meter will always be influenced by the way it is used. The only way you can obtain the accuracy described by the manufacture is when the flow meter is operating as a “stand alone” unit and, equally important, only if the product passing through the flow meter is complete air-free.

The submitter provided the following:

During the past 20 years, the need for improved efficiency in the collection of milk has resulted in the use of milk pumping equipment being installed on milk tankers.

One of the most obvious places for a modern Dairy to optimize is the amount of time that the milk tanker uses to make a collection. If you can reduce the collection time at each farmer, the Dairy will be able to get a significant reduction in collection and transport cost for the benefit of the Farmer, Consumer and the Dairy itself. At the same time, you will get an environmental benefit as a result of reduced CO₂ in the milk collection process.

The consequence of introducing pump systems on milk tankers is that it causes air to be mixed with the milk which again will influence the accuracy of the magnetic flow-meter mounted in the system. Milk entrains air unlike petroleum liquids which do not. As you know, the flow meter will count anything that passes through the meter – liquid as well as air – and it is therefore essential that as much air as possible is removed from the milk before it reaches the flow-meter. However, it is widely recognized that it is not possible to remove all the air from the milk, which will result in an inaccuracy.

It is therefore essential that the tolerances for vehicle mounted milk pump systems using magnetic flow-meters for determining milk volume reflects today's way of collecting milk. This means that existing Tolerance for milk meters cannot be used when the milk meter is a part of a system where different system parts will influence the accuracy of the count. Such milk metering systems will need to be classified with their own tolerances.

Based on our 25 years of experience as a manufacturer of these systems and more than 3000 installations on milk trucks operating in more than 15 countries, we would like to propose that the Tolerance for Vehicle Mounted Milk Metering Systems is changed from 0.3% to 0.5% and that the tolerances will be listed and classified separately and not be associated with products from the oil industry. Our proposal is consistent with Weights & Measures tolerances accepted around the world.

We hope that the NCWM will consider our proposal and we will be more than happy to meet with you and answer any questions you may have. We believe that a change of Tolerance is necessary in order for the Handbook 44 to reflect today's milk collection and the technical progress within milk collection.

Yours sincerely

Poul Tarp
President POUL TARP A/S

The POUL TARP milk pump system holds an MID approval which is recognized and in accordance with guidelines and standards described in the **OIML - INTERNATIONAL ORGANIZATION OF LEGAL METROLOGY**

1 FLOW COMPUTERS REGULATION IN THE US:

DANAK
PROD Reg. nr. 7025

FORCE
Certification

EC-Type Examination Certificate
Measuring Instrument Directive

Certificate number: DK-0200-MI005-006
Issued by FORCE Certification, Denmark
EC-notified body number 0200

In accordance with the Directive 2004/22/EC of the European Parliament and Council of March 31st, 2004 on measuring instruments (MID) with later amendments.

Issued to: Ingeniørfirmaet Poul Tarp A/S
Jomfruløkken 4
DK - 8930 Randers NØ
Denmark

Reference No.: 115-24938

Type of instrument: Milk Measuring System on road tankers (or stationary)

Type designation: PT LVMS - Poul Tarp Liquid Volume Measuring System

Type variants: type 2, type 3 and type 4

Valid until: August 10, 2025

Number of pages: 38 including appendix

Date of issue: August 10, 2015

Approved by: *[Signature]*
Lene Savstrup Kristensen
Certification Manager

Processed by: *[Signature]*
Lars Parmo
Examiner

The conformity markings may only be affixed to the above type approved equipment. The manufacturer's Declaration of Conformity may only be issued and the notified body identification number may only be affixed on the instrument when the production/product assessment module (D or F) of the Directive is fully complied with and controlled by a written inspection agreement with a notified body. This EC-type examination certificate may not be reproduced except in full, without written permission by FORCE Certification.

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DANAK
PROD Reg. nr. 7025

FORCE
Certification

DK-0200-MI005-006

Appendix to
EC-Type Examination Certificate
Measuring Instrument Directive

Number: DK-0200-MI005-006
Issued by FORCE Certification, Denmark
EC-notified body number 0200

Revision	Issue date	Changes
DK-0200-MI005-006	09-01-2015	First issue
DK-0200-MI005-006	10-08-2015	Second issue

The measuring system has the following characteristics

Accuracy class	0.5
Mechanical class	M3
Electromagnetic class	E3
Climatic class	Condensing/open location, H3
Ambient temperature	-25 / +55 °C
Liquid temperature	0 / +50 °C
Liquid pressure max	1 bar
Liquid types	Milk (Raw milk)
Liquid density	1,035 Kg/L at 5 °C +/- 0,02 Kg/L
Liquid conductivity	≥ 5 µS/cm

Flow characteristics for Measuring System, including Minimum Measured Quantity (MMQ), depends on actual flow sensor Proces Data 340 series in combination with Gas Elimination Device (GED) used:

MS/Meter	GED	Qmax (m³/h)	Qmax (L/m)	Qmin (m³/h)	Qmin (L/m)	MMQ (L)	Inlet (mm)
Type	Type	Type	Type	Type	Type	Type	Type
Type2+4/C51	PTe355	22,2	600	4	67	300	51
Type3/C63	PTe506	80	1334	5	84/(250)*	300/(100)*	63,5
Type3/C76	PTe506	90	1500	12	200	300	75
Type3/C102	PTe506	90	1500	18	300	300	102

Note: The ratio between Qmax and Qmin of the measuring system, shall be at least 5 (5:1) within the flow rate range of the actual meter sensor in combination with relevant Gas elimination device.
*) MMQ 100 liter only after first delivery on full system.

Primary display on flow computer S12:

Indication:

Maximum capacity	99999 L	or	99999,9 L
Minimum increment of registration	1 L		0,1 L

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Applied documents

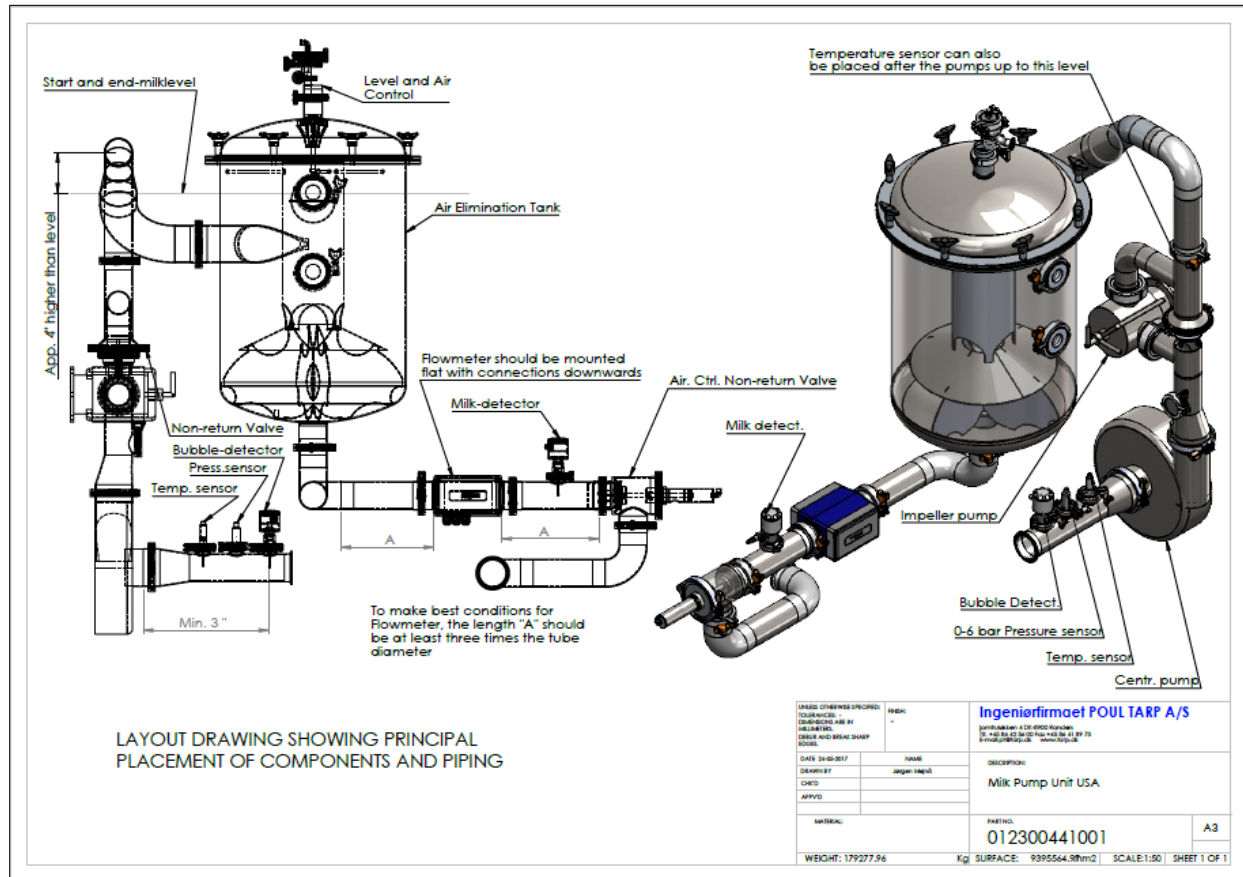
Recommendations	Guides
OIML R117 (1995)	WELMEC Guide 10.5 Marking of fuel dispensers (2006)
OIML R117-1 (2007)	WELMEC Guide 10.6 Sealing of fuel dispensers (2008)
OIML D11 (2004)	
OIML R117-2 Annex – E (CD2)	

Applied Evaluation Certificates belonging to this Type Examination Certificate:

- Evaluation Certificate Force Certification No. 115-24938.05, issued 10.08.2015
- Evaluation Certificate and Description NMI no. TC7204 rev 6, issued 26 august 2014
- Documentation folder NMI no. TC7204-4

Technical documentation
Reference no.: 114-30557.

The standards related to metrological aspects come from OIML R117-1 for liquids (Dynamic measuring systems for liquids other than water, part 1: Metrological and technical requirements) and documents D11 (General requirements for electronic measuring instruments) and D31 (General requirements for software-controlled measuring instruments) from OIML.



NCWM 2020 Interim Meeting: Mr. Carey McMahon (Poul Tarp) provided a presentation on his company's VTM milk metering system advocating for expanding tolerances for these systems.

Ms. Leigh Hamilton (Piper) provided a presentation concerning the piper system and stated in her presentation that piper currently has an approved NTEP certificate for their device that is in service in the U.S. Ms. Leigh opposes this item to increase the tolerances for milk meters and noted in her presentation that there may not be a need to increase the tolerances in order to move forward in allowing innovation in milk measurements.

Mr. Charles Stutesman (KS) provided a presentation on research that KDA has done on the history of 3 HB 44 Codes (3.31. VTMs, 3.35. Milk Meters, and 4.42. Farm Milk Tanks) and the issue of Piper's NTEP Certificate. Mr. Stutesman discussed complications involved in measurement of product using various methods and potential shortcomings of Piper's NTEP Certificate.

Mr. Doug Musick (KS) stated that he does not believe there is enough information presented to change existing tolerances and noted that the Piper system was only evaluated for accuracy up to a measurement of 300 gallons. He also noted that he believes that Piper's certificate should be amended to qualify the system for draft sizes up to 300 gallons. Mr. Mike Keilty (Endress + Hauser) commented that he had concerns with Piper's certificate. Ms. Hamilton noted that Piper followed and followed guidelines as provided during the NTEP evaluation. Ms. Diane Lee (NIST

1 OWM) stated that the committee may want to consider a developing status for this item and that more information is
2 needed concerning air elimination methods for milk metering systems.

3 A representative from the Dairy Farmers of America, stated that they oppose the increase in tolerance but supports the
4 use of VTM metering systems. Mr. Carey McMahon (Poul Tarp) pointed out that the Poul Tarp system can be accurate
5 for any size measurement, but the beginning and end of the measurement would not be accurate measures (within
6 tolerance) due to entrained air in the product when the flow is not uniform. Mr. Dmitri Karimov (MMA) stated that
7 the proposal should be further developed and pointed out that due to the tolerance structure becoming more stringent
8 as the volume of the measurement increases, the acceptance tolerance at 500 gallons is unreasonable. Mr. Hal Prince
9 (Florida) stated that he does not agree with expanding the tolerances. Mr. Prince believes that air elimination should
10 be the focus and that the proposal should be assigned to a task group. Mrs. Tina Butcher (NIST OWM) noted that
11 testing should be performed using multiple quantities and flowrates. Mr. Charles Stutesman (KS) pointed out that
12 confusion is generated by multiple HB 44 codes addressing the measurement of milk and that the proposal should be
13 assigned to a TG to sort this out. Mr. Stutesman also pointed out there is no requirements in HB 44 for air elimination
14 pertaining to milk metering in these codes. Mrs. Butcher noted that the current HB 44 requirements may not be
15 flexible enough for this new technology and that the existing codes may need to be reviewed and updated.

16 Ms. Leigh Hamilton (Piper) stated that this is not simply a consideration of only a change in tolerances. There are
17 other requirements (currently in the OIML standard) that should also be considered in making any changes to the
18 existing HB 44 requirements. Mr. Mike Keilty (Endress+Hauser) stated that air elimination is a difficult problem to
19 mitigate and noted that he is not sure if it is necessary to expand the existing tolerances or make other amendments.
20 Mr. Carey McMahon (Poul Tarp) stated that using the existing HB 44 tolerances in the VTM Code, at a draft of 5000
21 gallons, the tolerance value is highly unreasonable (KS) noted that the type evaluation performed on the Piper system
22 was limited to a draft of 300 gallons. If evaluation had included other draft sizes, the Piper system mat have failed
23 the testing.

24 Mr. Ken Ramsburg (MD) stated that the proposal should be given a developing status. Mr. Ramsburg agreed that
25 there is no existing requirement for this type of system addressing air elimination and stated that the flow meter, air
26 eliminator, plumbing, and pumps all need to be considered during evaluation and the evaluation should be conducted
27 on the system.

28 Mr. Tim Chesser (AR) questioned whether the flow meter used in the system is appropriate and noted that there are
29 many unanswered questions surrounding this issue. Mr. Jim Willis (NY) recommended a developing status for this
30 item. Mr. Kevin Schnepf (CA) stated that although he is opposed to relaxing existing tolerances, he supports the
31 development of this proposal by an assigned task group.

32 During the Committee's work session, the committee agreed that this item has merit and should be given an Assigned
33 status. The charge to the assigned task group will be to address three HB 44 codes (VTM, Farm Milk Tanks and Milk
34 meters) to review the requirements and tolerances found in these codes and assess the need for changes.

35 NCWM 2020 Annual Meeting: Due to the 2020 Covid-19 pandemic, this meeting was adjourned to January 2021, at
36 which time it was held as a virtual meeting. Due to constraint of time, only those items designated as 2020 Voting
37 Items were addressed. All other items were addressed in the subsequent 2021 NCWM Interim Meeting.

38 NCWM 2021 Interim Meeting: The Committee heard from Mr. Charles Stutesman (KS, Char of the Milk Meter Task
39 Group) who gave an update on the task group activities. Mr. Stutesman reported that the Milk Meter Task group
40 worked via e-mail communication and reviewed and discussed the proposed Milk Meter Tolerances in Agenda item
41 VTM-20.2. The Milk Meter Task Group also discussed the tolerances that are included in NIST HB 44 for Milk
42 meters in various parts of HB 44 which include the VTM, Section 3.31, Farm Milk Tanks, Section 4.42., Mass Flow
43 Meters, Section 3.37, and Milk Meters, Section 3.35. Mr. Stutesman also reported that the task group reviewed OIML
44 tolerances for milk meters. Mr. Stutesman stated that after a review of the various tolerances, the task group agreed
45 that the OIML tolerances provide tolerances that encompassed the system of measuring milk and not just a tolerance
46 for the performance of the meter. The Milk Meter Task group agreed with proposing the use of the OIML milk meter
47 tolerance as the milk meter tolerances in the VTM code. Mr. Stutesman provided a copy of the proposed changes to

VTM-20.2. The proposed tolerances will align the tolerances in the VTM Code for Milk Meters with OIML Milk Meter Tolerances. Mr. Stutesman requested that this item move forward as a Voting item. The Committee also heard from Clark Cooney who noted that he supported the items as Developing because one company mentioned meeting the existing tolerances. It was mentioned that the company's testing was only performed over a limited range of volumes.

During the committee's work session the committee agreed with the proposal from the milk meter task group to adopt OIML tolerances for milk meters in the VTM code, that this item be given a voting status, and that the item under consideration be replaced with the work groups proposal to adopt OIML tolerances. The committee also agreed with expanding the task group to address other milk meter codes in HB 44. The Item Under Consideration above are the tolerances agreed to by the milk meter task group and that align with OIML tolerances.

NCWM 2021 Annual Meeting: Mr. Charlie Stutesman provided an update on the milk meter task group activities. Mr. Stutesman noted that there was a field trip to observe milk metering systems. He noted that the proposed tolerances will align the milk tolerances with the OIML tolerances for milk meters and Mr. Stutesman noted that the OIML tolerances provides one tolerance for the meter and another tolerance for a milk metering system. He also noted that it may be impractical to perform an air eliminator test on these devices due to comingling of product.

During the committee's work session, the Committee agreed to a Voting Status for this item and added it to its voting consent calendar.

During the voting session, Mr. Charlie Stutesman asked that consideration be given to adding a non-retroactive date to the proposed tolerances. It was questioned during the discussion that if a non-retroactive date was added to the tolerances, then, what tolerances would apply to existing meters that had been manufactured and tested prior to the non-retroactive date. One of the concerns expressed with having a new tolerance table without a nonretroactive date was whether or not existing devices would be required to be reevaluated in the NTEP. The conference voted against adding the nonretroactive requirement to the proposed tolerance table and the item under consideration to change the tolerances failed to receive the 27 votes from the House of State Representatives, so the item failed and went back to the S&T committee. The S&T Committee agreed to a Developing status for this item.

Note: For reference, the Item under Consideration that was included in the 2021 NCWM Interim Meeting Agenda is provided below:

Table 2. Tolerances for Vehicle-Mounted Milk Meters		
Indication (gallons)	Maintenance Tolerance (gallons)	Acceptance Tolerance (gallons)
100	0.5 <u>0.6</u>	0.3 <u>0.5</u>
200	0.7 <u>1.2</u>	0.4 <u>1.0</u>
300	0.9 <u>1.8</u>	0.5 <u>1.5</u>
400	1.1 <u>2.4</u>	0.6 <u>2.0</u>
500	1.3 <u>3.0</u>	0.7 <u>2.5</u>
Over 500	Add 0.002 <u>0.006</u> gallons per indicated gallon over 500	Add 0.001 <u>0.005</u> gallons per indicated gallon over 500

NCWM 2022 Interim Meeting: Mr. Charlie Stutesman (KS) spoke as chairperson of the Milk Meter Task Group. He requested that this item be assigned back to the task group for further development. Mr. Stutesman provided an update on the task group meeting in January 2022 in which they discussed tolerances in both 3.31 Vehicle Tank Meters and 3.35 Milk Meters and the need to have the tolerance be applied to both vehicle mounted and station meters as the

1 manufacturers are developing meters that will be capable of being installed in either application. The tolerance tables
2 can be found in the supporting documents. Mr. Stutesman also renewed the task groups request to expand its scope
3 to include possibly creating a new code that contains requirements of both vehicle mounted and stationary milk meters
4 and metering systems due to the unique properties of milk as a liquid. Speaking on behalf of himself, Mr. Stutesman
5 (KS) stated that he has provided a document in the supporting documents that outlines the four active and five inactive
6 NTEP certified meters and metering systems in terms of test draft size and applicable tolerances. He noted that the
7 active four have a range of 0.12%-0.6%. He also noted that milk meters are the only liquid measuring device where
8 the volume tolerance decreases as the draft size increases and suggests percentages more in line with OIML tolerance
9 would be more appropriate. Mr. Ken Ramsburg (MD) suggested combining the two tolerances to be used for field
10 evaluations. Ms. Diane Lee (NIST OWM) commented that the task group should work toward making all test methods
11 uniform. Mr. Doug Musick (KS) and Mr. Matt Douglas (CA) supported assigning this item to the task group for
12 further development. During committee work sessions, the committee agreed to assign this item back to the milk
13 meter task group so they may continue to ascertain data. In addition, the committee agreed to request that NCWM
14 Chairman Ivan Hankins expand the scope of the task group to include all reference to milk meters, meter systems and
15 related test methods, specifications and tolerance in an effort to harmonize the codes.

16 NCWM 2022 Annual Meeting: The Milk Meter Task Group Chair, Mr. Charles Stutesman (KS) provided an update
17 on the task group's activity. Mr. Stutesman solicited comments and feedback from membership to continue efforts
18 towards development. He also stated the task group is seeking a representative from the Western regional to serve on
19 the task group and mentioned Mr. Aaron Yonkers of Colorado as a potential member. Mr. Stutesman mentioned he is
20 intending to submit a request to the Committee to expand the task group's scope, including the gathering of all milk
21 meter codes for consolidation into a single code.

22 NCWM 2023 Interim Meeting: Matt Curran (State of Florida) – appears that this item is lowering the tolerance to get
23 a device to fit. Supports as voting if that is the case. Tina Butcher (NIST OWM) commented in support of assigned
24 status and that the application systems and meter needs clarification. The committee decided to leave this item as
25 assigned status and hopes a new task group chair steps forward.

26 NCWM 2023 Annual Meeting: The Chair of the Specifications and Tolerances Committee asked for a volunteer for
27 chair of the task group.

28 **Regional Associations' Comments:**

29 CWMA 2023 Interim Meeting: No comments were heard.

30 The committee recommends this item be blocked with MLK 23.2 and remain as assigned with the task group so that
31 a chair can be assigned and established concerns continued to be addressed.

32 WWMA 2023 Annual Meeting: During the WWMA 2023 annual meeting the following comments were received:

33 Mr. Aaron Yanker (Milk Meter Tolerance Task Group): Commented that there is currently no Chair for the Task
34 Group, and no updates were available.

35 The WWMA S&T Committee recommended this item remain Assigned to the NCWM Milk Meter Tolerance Task
36 Group for further development. The committee looks forward to a Chair being assigned and an update provided.
37 This committee also recommends this item be blocked with MLK-23.2.

38 SWMA 2023 Annual Meeting: This is an assigned item however Dr. Matt Curran, Florida, recommended blocking
39 this item with MLK-23.2.

40 The committee recommends this item remain an Assigned item.

41 NEWMA 2023 Interim Meeting: The State of New Jersey stated that the Task Group still does not have a chair, despite
42 several requests from the NCWM S&T Committee, that manufacturers can meet the tolerances currently in the

handbook, and recommends withdrawal. The Commonwealths of Massachusetts and Pennsylvania, and the State of New York concur. Upon consensus of the body, the Committee recommends this item be Withdrawn.

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

LPG – LIQUIFIED PETROLEUM GAS AND ANHYDROUS AMMONIA LIQUID-MEASURING DEVICES

LPG-23.1 I S.2.5. Zero-Set-Back Interlock

Source:

National Propane Gas Association and U-Haul International

Purpose:

Address practical issues that propane retailers encounter when trying to comply with the zero setback requirements for propane stationary meters in Handbook 44.

Item under Consideration:

Amend Handbook 44, Liquefied Petroleum Gas and Anhydrous Ammonia Liquid-Measuring Devices Code as follows:

S.2.5. Zero-Set-Back Interlock.

S.2.5.1. Zero-Set-Back Interlock, Electronic Stationary Meters (Other than Devices used Exclusively as Stationary Retail Motor- Fuel Dispensers) and Electronic Vehicle-Mounted Meters. – A device shall be constructed so that after an individual delivery or multiple deliveries at one location have been completed, an automatic interlock system shall engage to prevent a subsequent delivery until the indicating element and, if equipped, recording element have been returned to their zero positions.

[Nonretroactive as January 1, 2021]

(Added 2019) (Amended 2021)

Note: Devices used exclusively for Stationary Retail Motor-Fuel dispensing are those only utilizing a K15 connection on the hose-end valve, as required in NFPA 58 “Liquefied Petroleum Gas Code”.

(Added 20XX)

S.2.5.2. Zero-Set-Back Interlock for Devices Used Exclusively as Stationary Retail Motor-Fuel Devices. – A device shall be constructed so that:

(a) after a delivery cycle has been completed by moving the starting lever to any position that shuts off the device, an automatic interlock prevents a subsequent delivery until the indicating elements and recording elements, if the device is equipped and activated to record, have been returned to their zero positions;

(b) the discharge nozzle cannot be returned to its designed hanging position (that is, any position where the tip of the nozzle is placed in its designed receptacle and the lock can be inserted) until the starting lever is in its designed shut-off position and the zero-set-back interlock has been engaged; and

(c) in a system with more than one dispenser supplied by a single pump, an effective automatic control valve in each dispenser prevents product from being delivered until the indicating elements on that dispenser are in a correct zero position.

[Nonretroactive as of January 1, 2017]

(Added 2016)

Previous Action:

2023: New Item

Original Justification:

This proposal reflects the intent of U-Haul International, Inc. and the National Propane Gas Association's Technology, Standards and Safety Committee, a volunteer organization comprised of 2500+ members, including propane retail marketers and others providing products or services to the propane industry.

The intent behind enacting the current version of S.2.5.2 was to create consistency among motor-fuel devices used for all products. This proposal strikes a balance between a consistent standard for retail motor-fuel devices and the diverse applications and industry standard for dispensing LP-Gas. To that end, this proposal addresses only those devices used exclusively for retail motor-fuel transfer. Multi-use LP-Gas devices that are used for the filling motor-fuel and other containers, including grill cylinders, forklift cylinders, cylinders used on recreational vehicles and even motor fuel containers, are covered by S.2.5.1.

Most LP-Gas dispensed is for purposes other than motor-fuel. (Less than 3% of all LP-Gas used in the United States is used for transportation. *See* U.S. Department of Energy, Alternative Fuels Data Center afdc.energy.gov/fuels/propane_basics.html.) Pursuant to NFPA 58, this is accomplished by a trained and certified employee dispensing LP-Gas, typically using analog (mechanical) meters, into cylinders and tanks. The analog (mechanical) meters are safe and effective, and most notably exempt from the zero-set-back requirement because S.2.5.1 only applies to electronic devices. Clearly, Handbook 44 recognizes this reality as S.2.5.1 does not require that all LP-Gas dispensers have zero-set-back interlocks, only electronic devices. S.2.5.1 is most appropriate because currently there is no readily available technology that can be used to retrofit an analog device. When looked at from a cost/benefit perspective, one has to question the expense of replacing an analog device with an electronic device at a location that mostly serves portable cylinders and not motor vehicle tanks when LP-Gas's use is so limited in transportation.

Furthermore, NFPA 58 currently does not allow the public to refuel its LP-Gas powered motor vehicles. All motor vehicles or other containers must be filled by a specially trained employee. A proposed change has been introduced for consideration in the 2023 edition of NFPA 58 that would permit public refueling of motor vehicles as long as the dispensing system meets very specific safety requirements, including a specialized nozzle, and is furnished with visible instructions. Upon the acceptance of this new public refueling allowance, the LP-Gas industry agrees that Zero-Setback-interlocks are needed. These public, self-service motor vehicle dispensing systems will be listed to Underwriters Laboratories Standard 495 and will be dedicated to the filling of motor vehicles.

For the minimal amount of retail motor fuel customers that a typical LP-Gas dispenser serves, both U-Haul and NPGA feel that this proposal represents the most equitable approach to date for balancing the need to ensure fair transactions and consistent standards with how the LP-Gas industry currently dispenses LP-Gas and LP-Gas's future transportation applications as envisioned by the proposed changes to NFPA 58 without conducting costly industry-wide retrofits of existing, functioning multi-use equipment. Handbook 44 needs to work with industry to make technical standards economically feasible lest it risk the advancement of LP-Gas as a viable and clean motor-fuel.

One continually occurring objection is that there would be no protection for the consumer without a zero-set-back feature on retail motor fuel devices. That really isn't the case, however, as the customer always has the option to check the dispenser and meter before the filling process begins to verify that it is starting at zero.

The submitter requested that this be a Voting item.

Comments in Favor:

Regulatory:

- 2023 Interim: Kevin Schnepf (California Division of Measurement Standards) supports item.
- 2023 Interim: Scott Simmons (Colorado Division of Oil and Public Safety) supports item with editorial changes recommended.
- 2023 Annual: Scott Simmons (CO): He supports the proposal and stated that RMFDs have a separate nozzle. Commented that “exclusive” devices are evident to the inspector.
- 2023 Annual: Scott Simmons (CO): Commented that Handbook 44 already has a prohibition on diverting into separate hoses.

Industry:

- 2023 Interim: Konrad Pilatowicz (U-Haul International, INC) asked for the item to be moved forwarded as voting.
- 2023 Interim: Mr. Bruce Sweicicki (National Propane Gas Association) asked for the item to be moved forwarded as voting.
- 2023 Interim: Mr. Wes Strawn (Red Seal Measurement) sent an amendment to the committee with updated wording.
- 2023 Interim: Dmitri Karimov (Advanced Flow Solutions dba Liquid Controls) supports as a voting item with proposed changes from Mr. Strawn.
- 2023 Annual: Konrad Pilatowicz (U-Haul): U-Haul submitted this item to create a balance and to have consistency among motor fuel dispensers. Feels the item makes sense and suggested it be made retroactive instead of non-retroactive.
- 2023 Annual: Scott Johnson (U-Haul): U-Haul supports the proposed changes and has approximately 1200 locations that fill motor fuel and cylinders. He believes that at some point in the future, customers will be able to fill their own cylinders. Automotive applications are about 3% of U-Haul’s business. His opinion is the word “exclusive” suggests that it is a dedicated system. He also stated that the nozzles used do not allow cylinder to be filled.
- 2023 Annual: Bruce Swiecicki (National Propane Gas Association): Stated that he will forward some new verbiage to clarify the language. Stated that he is not aware of any instances of fraud and that this helps the industry move forward for alternative fuels.

Advisory:

- None

Comments Against:

Regulatory:

- 2023 Annual: Stephen Benjamin (NC): Is opposed to the item and agrees with NIST OWM that it should be downgraded to Informational. Also stated that there are currently products on the market that can meet requirements. This is a carve out for a specific product and has not gone through the NTEP process. Agrees that the nozzle cannot be used to fill a cylinder currently but that could change in the future.
- 2023 Annual: Matt Douglas (CA): Shares most of the concerns with NIST.
- 2023 Annual: Steve Timar (NY): Agrees with NIST OWM that the item should be downgraded to informational.

Industry:

- 2023 Annual: Dmitri Karimov (MMA): Agrees with NIST OWM that the item should be downgraded to informational.

Advisory:

- 2023 Annual: Loren Minnich (NIST OWM): NIST OWM believes this item should be downgraded to informational to allow additional time for reviewing its impact. The term “used exclusively” does not provide clarity. OWM is also not sure this item provides what the submitter is looking for. See NIST OWM’s written analysis for more details.

Neutral Comments:

Regulatory:

- None

Industry:

- None

Advisory:

- 2023 Interim: Mrs. Tina Butcher (NIST) stated part of the problem is the look and feel of these systems is different from that of the RMF dispensers.

Item Development:

NCWM 2023 Annual Meeting: The committee heard comments from the floor and replaced the note under S.2.5.1. so that it reads:

Note: Devices used exclusively for Stationary Retail Motor-Fuel dispensing are those only utilizing a K15 connection on the hose-end valve, as required in NFPA 58 “Liquefied Petroleum Gas Code”.

After hearing comments during the voting session, expressing concerns regarding how the modified language is to be interpreted, the Committee conferred and downgraded the item to Informational before it went to a vote.

NCWM 2023 Interim Meeting: The committee heard comments from the floor in support of the changes submitted by Mr. Strawn (Red Seal) and has modified the item by adding the following note to S.2.5.1.:

Note: Analog (Mechanical) devices used for multiple purposes other than exclusively for Retail Motor Fuel Dispensing are exempt. Any devices used exclusively for Stationary Retail Motor-Fuel dispensing are subject to S.2.5.2.

The committee did not agree with striking “(Other than Stationary Retail Motor Fuel Dispensers)” from the title of S.2.5.1. and the title remains unchanged. With the modifications, the committee believes this item is fully developed and has assigned it a voting status.

Regional Associations’ Comments:

CWMA 2023 Interim Meeting: No comments were heard.

The committee recommends this item as withdrawn as we believe the attempted revision of this item was actually a resubmission listed under item LPG 24.2. The committee recommends that the discussion history for this item be moved to LPG 24.2. These recommendations are intended to clean up what we perceive to be an administrative error in that LPG 24.2 should not have been created, but should have been an update to this item (LPG 23.1).

WWMA 2023 Annual Meeting: During the WWMA 2023 annual meeting comments were heard from Mr. Kevin Schnepf (California, Division of Measurement Standards), Mr. Scott Simmons (Colorado, Division of Oil and Public Safety), and Mr. Steve Harrington (Oregon Department of Agriculture, Weights and Measures Program) supporting a Withdraw of this item in lieu of LPG-24.1, LPG-24.2, and OTH 24.1.

The WWMA 2023 S&T Committee recommends this item be Withdrawn.

SWMA 2023 Annual Meeting: Steve Benjamin, North Carolina, stated he opposed this item.

The committee recommends this item be Withdrawn.

NEWMA 2023 Interim Meeting: this item be informational. Upon consensus of the body, the Committee recommends this item be Informational.

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

LPG-24.1 ~~*S.1.5.7. Retail Motor Fuel Dispenser*~~*Liquefied Petroleum Gas Retail Motor Fuel Device.*, ~~*S.2.6.1. Electronic Stationary (Other than Stationary Retail Motor Fuel Dispensers*~~*Liquefied Petroleum Gas Retail Motor Fuel Device).*
~~*S.6.2. Automatic Timeout Pay-at-Pump Retail Motor Fuels Devices*~~*Liquefied Petroleum Gas Retail Motor Fuel Device.* and, ~~*S.4.3. Location of Marking Information: Retail Motor Fuel Dispensers*~~*Liquefied Petroleum Gas Retail Motor Fuel Device.*

Source:

National Propane Gas Association

Purpose:

The proposal is a companion to the main proposal to modify 3.32, S.2.5.1 and S.2.5.2, and the proposal to change the definition of Liquefied Petroleum Gas Retail Motor-Fuel Device. The purpose of this proposal is to correlate the terminology in 3.32 for LP-gas and use only the defined term as proposed in the companion proposal.

Item under Consideration:

Amend Handbook 44, Liquefied Petroleum Gas and Anhydrous Ammonia Liquid-Measuring Devices Code as follows:

~~*S.1.5.7. Totalizers for Retail Motor Fuel Dispensers*~~*Liquefied petroleum gas retail motor-fuel device.* – ~~*Retail motor-fuel dispensers*~~*Liquefied Petroleum Gas Retail Motor-Fuel Device* shall be equipped with a nonresettable totalizer for the quantity delivered through the metering device.
[Nonretroactive as of January 1, 2017]
(Added 2016)

~~*S.2.6.1. Electronic Stationary (Other than Stationary Retail Motor Fuel Dispensers*~~*Liquefied Petroleum Gas Retail Motor-Fuel Device).* – For individual deliveries, if there is no product flow for three minutes the transaction must be completed before additional product flow is allowed. The three-minute timeout shall be a sealable feature on an indicator.
[Nonretroactive as of January 1, 2021]
(Added 2021)

~~*S.2.6.2. Automatic Timeout Pay-at-Pump Retail Motor Fuel Devices*~~*Liquefied Petroleum Gas Retail Motor-Fuel Device* – Once a device has been authorized, it must deauthorize within three minutes if not activated. Reauthorization of the device must be performed before any product can be dispensed. If the time limit to deauthorize the device is programmable, it shall not accept an entry greater than three minutes.
[Nonretroactive as of January 1, 2022]
(Added 2021)

S.4.3. Location of Marking Information; ~~Retail Motor-Fuel Dispensers~~ Liquefied Petroleum Gas Retail Motor-Fuel Device. – The marking information required in General Code, paragraph G-S.1. Identification shall appear as follows:
(a) within 60 cm (24 in) to 150 cm (60 in) from the base of the dispenser;
(b) either internally and/or externally provided the information is permanent and easily read; and
(c) on a portion of the device that cannot be readily removed or interchanged (i.e., not on a service access panel).

The use of a dispenser key or tool to access internal marking information is permitted for ~~retail motor-fuel dispensers~~ **liquefied petroleum gas retail motor-fuel device.**
[Nonretroactive as of January 1, 2003]
(Added 2006)

Previous Status:

2024: New Proposal

Original Justification:

This is a companion to this group's proposal to Appendix D and the definition of "liquefied petroleum gas retail motor-fuel device." The proposed change to the definition will more precisely define what a liquefied petroleum gas retail motor-fuel device is. This is a UL-listed device that is electricity-powered and that has all of the features required by Handbook 44. It includes a safety nozzle that connects to the fill valve on the vehicle which will not flow gas unless a positive connection is made. These devices are required by NFPA 58 for all LP-gas dispensers installed at refueling facilities open to the public.

Opposition would most likely come from those opposed to the primary changes in S.2.5.1 and S.2.5.2.

Opposition may also come from those concerned about vehicles that do not have the K15 mating connection on the fill valve of the vehicle. Rebuttal to that would be that propane industry sources indicate that older vehicles that do not have the K15 connection are being retrofit at a high rate to incorporate the safety features of the K15 connection.

The submitter requested Voting status for these items n 2024.

Comments in Favor:

Regulatory:

-

Industry:

-

Advisory:

-

Comments Against:

Regulatory:

-

Industry:

-

Advisory:

-

Neutral Comments:

Regulatory:

-

Industry:

-

Advisory:

-

Item Development:

New Proposal

Regional Associations' Comments:

New Proposal

CWMA 2023 Interim Meeting: Greg VanderPlaats from Minnesota asked if LPG 23.1 needs to pass before this item can be considered.

The committee recommends this item as a voting item blocked with item OTH 24.1.

WWMA 2023 Annual Meeting: During the WWMA 2023 annual meeting comments were heard on LPG-24.1, LPG-24.2, and OTH-24.1 collectively:

Mr. Kevin Schnepf (California, Div. of Measurement Standards): Recommended items LPG-24.1, LPG-24.2, and OTH-24.1 be blocked. Mr. Scott Simmons (Colorado Div. of Oil and Public Safety) agreed.

Mr. Scott Simmons (Colorado, Div. of Oil and Public Safety): Commented that the items clarify what an LPG RMFD is, and that the zero-setback interlock requirement is only intended to apply to LPG RMFD, for example a standalone dispenser on an island. The result of applying this requirement to other LPG devices may negatively impact businesses and consumers through a rise in cost.

Mr. Kurt Floren (Los Angeles County, California) and Scott Simmons (Colorado Div. of Oil and Public Safety) had a discussion regarding the possibility of clarifying existing language in NIST HB 44 3.32 S.2.5.1 and S.2.5.2. which most find confusing. Mr. Kenn Burt (San Luis Obispo County, California) suggested that merging sections S.2.5.1. and S.2.5.2. might be a method of addressing the confusion of how to apply the code sections.

Mr. Kevin Schnepf (California, Div. of Measurement Standards): Questioned whether the intent of the items could better be addressed by exempting analog LPG devices from a zero-setback interlock requirement.

During open hearings there was a consensus of support for the items and a request to Block the three items. There were comments that this may be an opportunity to clarify existing language in HB 44 which most find confusing, and possibly merging S.2.5.1 and S.2.5.2. A question was also posed to the body to address the intent of the item by exempting analog devices from a Zero Set Back Interlock requirement.

Based on the comments heard during the open hearings the WWMA S&T Committee recommends this item be Blocked with LPG-24.2 and OTH-24.1 and that the Blocked items be assigned a Developing status to allow the body an opportunity to review the new language and allow the submitter time to address the comments heard during open hearings.

SWMA 2023 Annual Meeting: Steve Benjamin, North Carolina, stated he sees this item as cleanup and that a follow up item will be needed next year.

The committee recommends blocking this item with LPG-24.2 and OTH-24.1.

The committee recommends this item move forward as a Developing item

NEWMA 2023 Interim Meeting: The State of New York opposes this item and does not see the need for the changes. Upon consensus of the body, the Committee recommends this item be Developing.

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.

LPG-24.2 ~~S.2.5. Zero-Set-Back Interlock.~~ S.2.5. Zero-Set-Back Interlock.

Source:

National Propane Gas Association

Purpose:

The proposal will address practical issues that propane retailers encounter when trying to comply with the zero setback requirements for propane stationary meters in Handbook 44.

Item under Consideration:

Amend Handbook 44, Liquefied Petroleum Gas and Anhydrous Ammonia Liquid-Measuring Devices Code as follows:

~~**S.2.5. Zero-Set-Back Interlock.**~~

~~**S.2.5.1. Zero-Set-Back Interlock, Electronic Stationary Meters (Other than Stationary Retail Motor-Fuel Dispensers Liquefied Petroleum Gas Retail Motor-Fuel Device) and Electronic Vehicle-Mounted Meters. – A device shall be constructed so that after an individual delivery or multiple deliveries at one location have been completed, an automatic interlock system shall engage to prevent a subsequent delivery until the indicating element and, if equipped, recording element have been returned to their zero positions.**~~
~~**[Nonretroactive as January 1, 2021]**~~

~~**S.2.5.2. Zero-Set-Back Interlock for Stationary Retail Motor-Fuel Devices Liquefied Petroleum Gas Retail Motor-Fuel Device. – A device shall be constructed so that:**~~

~~**(a) after a delivery cycle has been completed by moving the starting lever to any position that shuts off the device, an automatic interlock prevents a subsequent delivery until the indicating elements and recording elements, if the device is equipped and activated to record, have been returned to their zero positions;**~~

~~**(b) the discharge nozzle cannot be returned to its designed hanging position (that is, any position where the tip of the nozzle is placed in its designed receptacle and the lock can be inserted) until the starting lever is in its designed shut-off position and the zero-set-back interlock has been engaged; and**~~

~~**(c) in a system with more than one dispenser supplied by a single pump, an effective automatic control valve in each dispenser prevents product from being delivered until the indicating elements on that dispenser are in a correct zero position.**~~
~~**[Nonretroactive as of January 1, 2017]**~~

S.2.5. Zero-Set-Back Interlock

S.2.5.1. Zero-Set-Back Interlock, Electronic Stationary Meters (Other than Stationary Retail Motor-Fuel Dispensers Liquefied Petroleum Gas Retail Motor-Fuel Device) and Electronic Vehicle-Mounted Meters. A

device shall be constructed so that after an individual delivery or multiple deliveries at one location have been completed, an automatic interlock system shall engage to prevent a subsequent delivery until the indicating element and, if equipped, recording element have been returned to their zero positions.

S.2.5.2. Zero-Set-Back Interlock for Stationary ~~Retail Motor Fuel Devices~~ Liquefied Petroleum Gas Retail Motor-Fuel Device. – A device shall be constructed so that:

(a) after a delivery cycle has been completed by moving the starting lever to any position that shuts off the device, an automatic interlock prevents a subsequent delivery until the indicating elements and recording elements, if the device is equipped and activated to record, have been returned to their zero positions;

(b) the discharge nozzle cannot be returned to its designed hanging position (that is, any position where the tip of the nozzle is placed in its designed receptacle and the lock can be inserted) until the starting lever is in its designed shut-off position and the zero-set-back interlock has been engaged; and

(c) in a system with more than one dispenser supplied by a single pump, an effective automatic control valve in each dispenser prevents product from being delivered until the indicating elements on that dispenser are in a correct zero position.

Previous Status:

2024: New Proposal

Original Justification:

This proposal reflects the intent of U-Haul International, Inc. and the National Propane Gas Association's Technology, Standards and Safety Committee, a volunteer organization comprised of 2500+ members, including propane retail marketers and others providing products or services to the propane industry.

The intent behind enacting the current version of S.2.5.2 was to create consistency among motor-fuel devices used for all products. This proposal strikes a balance between a consistent standard for retail motor-fuel devices and the diverse applications and industry standard for dispensing LP-Gas. To that end, this proposal addresses only those devices used exclusively for retail motor-fuel transfer. Multi-use LP-Gas devices that are used for the filling motor-fuel and other containers, including grill cylinders, forklift cylinders, cylinders used on recreational vehicles and even motor fuel containers, are covered by S.2.5.1.

Most LP-Gas dispensed is for purposes other than motor-fuel. (Less than 3% of all LP-Gas used in the United States is used for transportation. See U.S. Department of Energy, Alternative Fuels Data Center afdc.energy.gov/fuels/propane_basics.html.) Pursuant to NFPA 58, this is accomplished by a trained and certified employee dispensing LP-Gas, typically using analog (mechanical) meters, into cylinders and tanks. The analog (mechanical) meters are safe and effective, and most notably exempt from the zero-set-back requirement because S.2.5.1 only applies to electronic devices. Clearly, Handbook 44 recognizes this reality as S.2.5.1 does not require that all LP-Gas dispensers have zero-set-back interlocks, only electronic devices. S.2.5.1 is most appropriate because currently there is no readily available technology that can be used to retrofit an analog device. When looked at from a cost/benefit perspective, one has to question the expense of replacing an analog device with an electronic device at a location that mostly serves portable cylinders and not motor vehicle tanks when LP-Gas's use is so limited in transportation.

Furthermore, NFPA 58 currently does not allow the public to refuel its LP-Gas powered motor vehicles. All motor vehicles or other containers must be filled by a specially trained employee. A proposed change has been introduced for consideration in the 2023 edition of NFPA 58 that would permit public refueling of motor vehicles as long as the dispensing system meets very specific safety requirements, including a specialized nozzle, and is furnished with visible instructions. Upon the acceptance of this new public refueling allowance, the LP-Gas industry agrees that Zero-Setback-interlocks are needed. This public, self-service motor vehicle dispensing systems will be listed to Underwriters Laboratories Standard 495 and will be dedicated to the filling of motor vehicles.

For the minimal amount of retail motor fuel customers that a typical LP-Gas dispenser serves, both U-Haul and NPGA feel that this proposal represents the most equitable approach to date for balancing the need to ensure fair transactions and consistent standards with how the LP-Gas industry currently dispenses LP-Gas and LP-Gas's future transportation applications as envisioned by the proposed changes to NFPA 58 without conducting costly industry-wide retrofits of existing, functioning multi-use equipment. Handbook 44 needs to work with industry to make technical standards economically feasible lest it risk the advancement of LP-Gas as a viable and clean motor-fuel.

At its August 2022 meeting, the Central Weights and Measures Association recommended LPG-23.1 as a Developing Item with the following comment: *"The Committee has concerns regarding a consumer/customer starting a deliver when the device is not on zero."* In response, there are two points to make regarding the transfer of liquid propane into a container. The first is that any transfer made into cylinders (not mounted on vehicles) would have to be done by propane service personnel. The customer would not be permitted to transfer product into any cylinder, even if they own that container.

Secondly, LPG-23.1 is intending to clarify that dispensers which are used *exclusively for retail motor fuel* will be subject to the zero setback requirements. It is only these dispensers, which are installed at public retail motor vehicle refueling stations, that are permitted to be operated by the general public to refuel vehicles. Therefore, because of the zero setback and time-out provisions in Handbook 44, there really is no opportunity for the customer to "game" the dispenser system.

We propose to strike the nonretroactivity date from the proposal in recognition that vehicles that will be refueling from these dispensers will be utilizing the proper connection. New vehicles have had the connection for several years and existing vehicles are being retrofit to accommodate the safety features that the K15 connection offers. The revisions proposed to the definition of "liquefied petroleum gas retail motor-fuel device" will complete the loop and ensure that the dispenser technology is consistent with the requirements of NFPA 58 "LP-Gas Code."

Comments in Favor:

Regulatory:

-

Industry:

-

Advisory:

-

Comments Against:

Regulatory:

-

Industry:

-

Advisory:

-

Neutral Comments:

Regulatory:

-

Industry:

-

Advisory:

-

Item Development:

New Proposal

Regional Associations' Comments:

New Proposal

CWMA 2023 Interim Meeting: Greg VanderPlaats from Minnesota asked if there is a concern with one of the LPG items passing and not the others. Should they be blocked together?

The committee recommends this item as a voting item.

The committee believes that this item is an attempted revision of item LPG 23.1 and should not have been submitted. Now that this item has been submitted, the committee recommends that the discussion history for LPG 23.1 be moved to LPG 24.2. These recommendations are intended to clean up what we perceive to be an administrative error in that LPG 24.2 should not have been created but should have been an update to item LPG 23.1.

WWMA 2023 Annual Meeting: During the WWMA 2023 annual meeting comments were heard on LPG-24.1, LPG-24.2, and OTH-24.1 collectively:

Mr. Kevin Schnepf (California, Div. of Measurement Standards): Recommended items LPG-24.1, LPG-24.2, and OTH-24.1 be blocked. Mr. Scott Simmons (Colorado Div. of Oil and Public Safety) agreed.

Mr. Scott Simmons (Colorado, Div. of Oil and Public Safety): Commented that the items clarify what an LPG RMFD is, and that the zero-setback interlock requirement is only intended to apply to LPG RMFD, for example a standalone dispenser on an island. The result of applying this requirement to other LPG devices may negatively impact businesses and consumers through a rise in cost.

Mr. Kurt Floren (Los Angeles County, California) and Scott Simmons (Colorado Div. of Oil and Public Safety) had a discussion regarding the possibility of clarifying existing language in NIST HB 44 3.32 S.2.5.1 and S.2.5.2. which most find confusing. Mr. Kenn Burt (San Luis Obispo County, California) suggested that merging sections S.2.5.1. and S.2.5.2. might be a method of addressing the confusion of how to apply the code sections.

Mr. Kevin Schnepf (California, Div. of Measurement Standards): Questioned whether the intent of the items could better be addressed by exempting analog LPG devices from a zero-setback interlock requirement.

During open hearings there was a consensus of support for the items and a request to Block the three items. There were comments that this may be an opportunity to clarify existing language in HB 44 which most find confusing, and possibly merging S.2.5.1 and S.2.5.2. A question was also posed to the body to address the intent of the item by exempting analog devices from a Zero Set Back Interlock requirement.

Based on the comments heard during the open hearings the WWMA S&T Committee recommends this item be Blocked with LPG-24.2 and OTH-24.1 and that the Blocked items be assigned a Developing status to allow the body an opportunity to review the new language and allow the submitter time to address the comments heard during open hearings.

SWMA 2023 Annual Meeting:

Steven Benjamin, North Carolina, asked the committee to double check the language used in the agenda because he believed it to be incorrect. The committee found that the language format was incorrect compared to the language used in the Form 15. The committee has decided to consider the language and formatting used in the items Form 15. This language is as follows:

S.2.5. Zero-Set-Back Interlock.

S.2.5.1. Zero-Set-Back Interlock, Electronic Stationary Meters (Other than Stationary ~~Retail Motor-Fuel Dispensers~~ Liquefied Petroleum Gas Retail Motor-Fuel Device) and Electronic Vehicle-Mounted Meters. – *A device shall be constructed so that after an individual delivery or multiple deliveries at one location have been completed, an automatic interlock system shall engage to prevent a subsequent delivery until the indicating element and, if equipped, recording element have been returned to their zero positions.*

{Nonretroactive as January 1, 2021}

S.2.5.2. Zero-Set-Back Interlock for Stationary ~~Retail Motor-Fuel Devices~~ Liquefied Petroleum Gas Retail Motor-Fuel Device. – *A device shall be constructed so that:*

(a) after a delivery cycle has been completed by moving the starting lever to any position that shuts off the device, an automatic interlock prevents a subsequent delivery until the indicating elements and recording elements, if the device is equipped and activated to record, have been returned to their zero positions;

(b) the discharge nozzle cannot be returned to its designed hanging position (that is, any position where the tip of the nozzle is placed in its designed receptacle and the lock can be inserted) until the starting lever is in its designed shut-off position and the zero-set-back interlock has been engaged; and

(c) in a system with more than one dispenser supplied by a single pump, an effective automatic control valve in each dispenser prevents product from being delivered until the indicating elements on that dispenser are in a correct zero position.

{Nonretroactive as of January 1, 2017}

The committee recommends this item move forward as a Developing item, with the language and formatting used in the Form 15 and suggests blocking the item with LPG-24.1 and OTH-24.1.

1

2 NEWMA 2023 Interim Meeting: The State of New York opposes this item and does not see the need for the changes,
3 the new wording is no longer in italics and questions if the submitters are suggesting it be retroactive as it is not stated
4 in justification. It was pointed out that this item is similar to LPG-23.1 but does not include UHaul and the National
5 Propane Gas Association requested withdrawal of LPG-23.1 in this proposal. Upon consensus of the body, the
6 Committee recommends this item be Developing.

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

9 **MLK – MILK METERS**

10 **MLK-23.2 A Table T.1. Tolerances for Milk Meters**

11 **Source:**
12 Milk Meter Tolerances Task Group

Purpose:

Eliminate the current tolerance structure of a decreasing permissible tolerance allowance as the size of the test draft increases.

Item Under Consideration:

Amend Handbook 44, Milk Meters Code, as follows:

T.2. Tolerance Values. – Tolerances shall be as shown in Table 1. Tolerances for Milk Meters.

(Amended 1989, 20XX)

Table 1. Tolerances for Milk Meters		
Indication (gallons)	Maintenance Tolerance (gallons)	Acceptance Tolerance (gallons)
100	0.5	0.3
200	0.7	0.4
300	0.9	0.5
400	1.1	0.6
500	1.3	0.7
Over 500	Add 0.002 gallon per indicated gallon over 500	Add 0.001 gallon per indicated gallon over 500

(Added 1989)

Table 1. Tolerances for Milk Meters		
	<u>Acceptance Tolerance</u>	<u>Maintenance Tolerance</u>
<u>Complete Measuring System</u>	<u>0.5%</u>	<u>0.5%</u>
<u>Meter Only</u>	<u>0.3%</u>	<u>0.3%</u>

(Amended 20XX)

Previous Action:

2023: New Item

Original Justification:

This is a companion item to VTM-20.2 [Vehicle Mounted Milk Meters] currently being considered. It would be logical to block these two items as the data and discussion for changes to both Handbook 44 sections will be identical. This proposal is being made to eliminate the current tolerance structure of a decreasing permissible tolerance allowance as the size of the test draft increases. The proposed changes are identical to the current tolerance structure in the international community that follow OIML R-117. Without the changes to the tolerances, it would be possible for a device to be within tolerance at small test drafts and be out of tolerance for larger test drafts that are more representative of a typical delivery.

If OIML tolerances are adopted, the tolerances that are currently in place may increase at larger test drafts.

Requested Status by Submitter: Voting Item

Comments in Favor:

Regulatory:

- 2023 Interim: Mr. Matt Curran (Florida Department of Agriculture and Consumer Services) recommended item be blocked with VTM 20.2.
- 2023 Interim: Mr. Kevin Schnepf (California Division of Measurement Standards) Agreed with Mr. Curran.

Industry:

- None

Advisory:

- 2023 Interim: Ms. Tina Butcher (OWM/NIST) saw no issues with blocking the item.

Comments Against:

Regulatory:

- None

Industry:

- None

Advisory:

- None

Neutral Comments:

Regulatory:

- None

Industry:

- None

Advisory:

- None

Item Development:

NCWM 2023 Interim Meeting: The committee decided to leave this item as assigned status and hopes a new task group chair steps forward.

NCWM 2023 Annual Meeting: The Chair of the Specifications and Tolerances Committee asked for a volunteer for chair of the task group.

Regional Associations' Comments:

CWMA 2023 Interim Meeting: No comments were heard.

The committee recommends this item be blocked with VTM 20.2 and remain as assigned with the task group so that a chair can be assigned and established concerns continued to be addressed.

WWMA 2023 Annual Meeting: During the WWMA 2023 annual meeting the following comments were received:

Mr. Aaron Yanker (Milk Meter Tolerance Task Group): Commented that there is currently no Chair for the Task Group, and no updates were available.

The WWMA S&T Committee recommended this item remain Assigned to the NCWM Milk Meter Tolerance Task Group for further development. The committee looks forward to a Chair being assigned and an update provided. This committee also recommends this item be blocked with VTM-20.2.

SWMA 2023 Annual Meeting: This is an assigned item however Dr. Matt Curran, Florida, recommended blocking this item with VTM 20.2.

The committee recommends this item remain an Assigned item

NEWMA 2023 Interim Meeting: The State of New Jersey stated that the Task Group still does not have a chair, despite several requests from the NCWM S&T Committee, that manufacturers can meet the tolerances currently in the handbook, and recommends withdrawal. The Commonwealths of Massachusetts and Pennsylvania, and the State of New York concur. Upon consensus of the body, the Committee recommends this item be Withdrawn.

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

HGM – HYDROGEN GAS-MEASURING DEVICES

HGM-23.1 D UR.3.8. Safety Requirement

Source:

Quong and Associates, Inc.

Purpose:

Add safety requirement for hydrogen gas measuring devices.

Item under Consideration:

Amend Handbook 44 Hydrogen Gas-Metering Devices Code as follows:

UR 3.8 Safety Requirement –All hydrogen gas-measuring devices subject to this code shall maintain verification of testing demonstrating conformance with the latest version of SAE J2601 Fuel Protocols for Light Duty Gaseous Hydrogen Surface Vehicles, as determined by the latest version of ANSI/CSA HGV 4.3 “Test Methods for Hydrogen Fueling Parameter Evaluation.

(Nonretroactive as of January 1, 10XX)

Previous Action:

2023: New Item

Original Justification:

The proper fueling of hydrogen vehicles is critical to ensure that the vehicle and high pressure tank is not damaged. Unlike other gases, such as compressed natural gas, hydrogen heats as a vehicle is fueled due to the reverse Joule-Thompson effect. This means that the fueling rate and temperature of the hydrogen must be carefully controlled, or damage can occur to the vehicle hydrogen tanks. The hydrogen industry has done considerable work in developing standard fueling protocols in SAE J2601 (https://www.sae.org/standards/content/j2601_202005/) and validation methods in ANSI/CSA HGV 4.3

(<https://www.csagroup.org/store/product/CSA%25100ANSI%20HGV%204.3%3A22/>) to ensure that the vehicles are fueled correctly and safely.

The validation of SAE J2601 using ANSI/CSA HGV 4.3 has been performed on the 50+ hydrogen stations in California by the Air Resources Board (ARB) (<https://ww2.arb.ca.gov/resources/documents/annual-hydrogen-evaluation>). The proposed requirement provides assurances that dispensers have been verified to the proper fueling protocol which will protect the dispenser, vehicle, and consumer.

While the California Department of Food and Agriculture is discussing submitting the same language for the California Code of Regulations, adding the same language of Handbook 44 would allow other states to understand and adopt the key hydrogen fueling protocol standards, thereby expanding the use of hydrogen throughout the United States.

The submitter acknowledged that some may argue that the equipment to validate stations is not available except in California.

The submitter's response would be that, first, there are other private companies who have the equipment to test dispensers outside of California, including stations in the northeast US. Second, HGV 4.3 allows for factory acceptance testing of dispensers prior to installation and an abbreviated Site Acceptance Test. This approach shortens the time and equipment necessary to verify a station meets SAE J2601. Third, the design and software of the Hydrogen Station Equipment Performance (HyStEP) Device used by ARB is publicly available. (<https://h2tools.org/hystep-hydrogen-station-equipment-performance-device>).

The submitter provided the following links:

SAE J2601: https://www.sae.org/standards/content/j2601_202005/ (copyrighted)

ANSI/CSA HGV 4.3 (<https://www.csagroup.org/store/product/CSA%25100ANSI%20HGV%204.3%3A22/>) (copyrighted)

California Air Resources Board: Annual Evaluation of Fuel Cell Electric Vehicle Deployment & Hydrogen Fuel Station Network Development

<https://ww2.arb.ca.gov/resources/documents/annual-hydrogen-evaluation> (many reports available, latest is too large to attach)

EVSE Pre_Rule Wkshop Shared Deck.pdf

The submitter requested that this be a Voting item in 2023.

Comments in Favor:

Regulatory:

- 2023 Interim: Mr. Kevin Schnepf (California Division of Measurement Standards) stated California has 68 stations that all require this standard and 33 private stations that do not have this requirement. Facilitates accurate and safe fueling. Supports item.
- 2023 Interim: Mr. Kevin Schnepf (California Division of Measurement Standards) in response to Mr. Currans comment, "it's a performance protocol as well", not just for safety.

Industry:

- 2023 Interim: Mr. Spencer Quong (QAI) gave a presentation during open hearings. Heat generated from filling can cause damage. This is important to protect the consumer. Requests informational status, so it can be continued to be developed.

Advisory:

- None

Comments Against:

Regulatory:

- None

Industry:

- None

Advisory:

- None

Neutral Comments:

Regulatory:

- 2023 Interim: Mr. Matt Curran (Florida Dept of Agriculture and Consumer Services) echoed Mrs. Butcher's comments.

Industry:

- None

Advisory:

- 2023 Interim: Mrs. Tina Butcher (NIST) stated, typically HB44 does not include safety requirements. That generally rests with non-WM agencies. She doesn't question the need but does question if HB44 is the right place for this.

Item Development:

CWMA 2023 Interim Meeting: No comments were heard.

The committee recommends this item be withdrawn. The committee questions the merit of this information being provided in Handbook 44, and have not received answers to questions outlined in the historical comments for this item.

WWMA 2023 Annual Meeting: During the WWMA 2023 annual meeting the following comments were received:

Mr. Kevin Schnepf (California, Division of Measurement Standards): Stated that data is being collected by CDFA-DMS and the California Air Resources Board. Mr. Schnepf requested that this item remain developing until the data can be provided.

The WWMA 2023 S&T Committee recommends this item remain Developing based on comments heard to allow the submitter the ability to provide data and address the concerns of the 2023 WWMA S&T and 2023 NCWM S&T comments. This Committee considered the comments recorded in the 2023 NCWM S&T Committee Interim Report in our analysis and echoes the concerns raised in the report on how this protocol affects performance in addition to safety.

SWMA 2023 Annual Meeting: Dr. Matt Curran, Florida, questioned if this is the proper venue for the safety requirements but supports safety concerns in the item.

The committee recommends this item remains as a Developing item to allow time for the data to be collected.

NEWMA 2023 Interim Meeting: Comments were heard that no additional data has been provided as to what the effects on the metrological parameters are. The States of New York and New Jersey, and Holliston, Massachusetts recommends withdrawal.

Upon consensus of the body, the Committee recommends this item be Withdrawn.

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

EVF – ELECTRIC VEHICLE FUELING SYSTEMS

EVF-24.1 S.1.3. Mobile Device as Indicating Element for AC Chargers.

Source:

Siemens Industry Inc., Smart Infrastructure eMobility

Purpose:

clarify that use of a hand-held mobile device such as a mobile phone to provide the Indicating Elements for an EVSE is an acceptable alternative to having the Indicating Elements built into the EVSE. This option is already accepted by the National Type Evaluation Program for certification.

Item under Consideration:

Amend Handbook 44 Electric Vehicle Fueling Systems as follows:

S.1.3. Mobile Device as Indicating Element for AC Chargers. – the indication requirements and elements specified in Section 3.40, sub-sections S.1.1., S.1.2., S.2.4.1, S.2.6, S.2.7, UR.1.1., and UR.3.1. may be fulfilled through either a display built into the EVSE or a display available via an application on a hand-held device such as a smart phone or in the purchaser’s vehicle receiving the electrical energy, such device or vehicle being in the immediate vicinity of the EVSE.

Previous Status:

2024: New Proposal

Original Justification:

Most AC chargers installed today for public charging do not have electronic displays. The requirements for showing prices, quantity delivered, cost of delivery, and other required data elements of Section 3.40 are fulfilled by displaying the data on a mobile phone or within the vehicle receiving the electrical energy. This alternative to having a display on the charger itself reduces the cost of the charger, as well as maintenance required when displays fail due to harsh outdoor conditions, including direct sunlight and wind, rain, and snow exposure. These conditions often make the built-in displays difficult to read. Having the option of providing the display on a mobile device or in the vehicle reduces costs, improves EVSE longevity, and, most importantly, improves the consumer experience. Moreover, EV drivers usually utilize their mobile phones to carry out charging transactions already, so the drivers are accustomed to receiving the information on their device or in their vehicle. Finally, the industry is moving toward Plug and Charge, based on the ISO 15118 standard. With Plug and Charge, the vehicle communicates with the charger to authenticate as well as initiate and end charging, with the fees processed automatically. With Plug and Charge, there is no interaction between the driver and the charger. ISO 15118 is a requirement for federal funding under the NEVI and FCI programs, as well as for some state funding, including in California.

The opposing arguments would be that there are, in fact, some AC chargers that have the Indication of Delivery on their face – but these are limited and much more expensive.

The submitter requested that this have Voting status in 2024 as a retroactive specification.

Comments in Favor:

Regulatory:

-

Industry:

-

Advisory:

-

Comments Against:

Regulatory:

-

Industry:

-

Advisory:

-

Neutral Comments:

Regulatory:

-

Industry:

-

Advisory:

-

Item Development:

New Proposal

Regional Associations' Comments:

New Proposal

CWMA 2023 Interim Meeting: No comments were heard.

The committee recommends this item as developing and seeks input from industry stakeholders.

WWMA 2023 Annual Meeting:

During the WWMA 2023 annual meeting the following comments were received:

General comments were heard from Mr. Chris King (Siemens), Ms. Francesca Wahl (Tesla), Mr. Kevin Schnepf (California, Division of Measurement Standards), Mr. Jose Arriaga (Orange County, CA), Mr. Mike Brooks (Arizona

- 1 Department of Ag: Weights and Measures), Mr. Brent Ricks (Montana Weights and Measures Program) supporting a
2 developing status of this item.
- 3 Mr. Chris King (Siemens) spoke to why this is needed, acceptable, and more affordable. He also claimed that there
4 are already devices nationally type evaluated in this manner. The committee questioned what NTEP approval number
5 Mr. King was referring to. Mr. King stated that he would provide a type evaluation number. He requested that members
6 review his presentation which is posted on the WWMA website and requested a developing status for this item.
- 7 Ms. Francesca Wahl (Tesla): Claimed that Tesla chargers are already using a display in vehicles not on the chargers
8 and that there is a CTEP (California Type Evaluation Program) for these chargers.
- 9 Mr. Kevin Schnepf (California, Division of Measurement Standards): Commented that there are no NTEP approved
10 systems with a remote device as an indicator and that Tesla's (CTEP) is for a charger and car as a system. Mr. Schnepf
11 also asked if we want the first ever device where the indication is the responsibility of the consumer? Stated that the
12 item requires further development.
- 13 Comments were also heard on the floor from Mr. Jose Arriaga (Orange County, CA), Mr. Mike Brooks (Arizona), and
14 Mr. Brent Ricks (Montana) regarding concern with this item, in particular:
- 15 - Accessibility of the mobile device by the consumer (credit card payment vs. mobile payment app).
 - 16 - Use and responsibility of the device indication by consumer.
 - 17 - Code should apply to DC as well as AC chargers.
 - 18 - Code should only apply to those devices which require a mobile app to activate.
 - 19 - Addressing potential wireless connection issues that may occur.
- 20 Mr. Brent Ricks (Montana Weights and Measures): Asked how the indication is connected to the charger (Bluetooth,
21 cell service, etc.). Mr. Chris King (Siemens) responded that an RFID is used to identify the user and also uses Bluetooth
22 on some devices. Ms. Francesca Wahl (Tesla) responded that per European regulation, it must be encrypted on back-
23 end with a key to tie them together.
- 24 The WWMA S&T Committee recommends that this item be assigned a Developing status to allow the submitter the
25 opportunity to consider the comments heard on the floor and receive feedback from stakeholders.
- 26 SWMA 2023 Annual Meeting: Tim Chesser, Arkansas, recommended the item be withdrawn because he was not
27 going to enforce indicating element requirements on cell phones of customers.
- 28 Dr. Matt Curran, Florida, echoed Mr. Chesser's comments and raised concern of privacy with customer cell phones.
- 29 Patrick Bean, Tesla, stated their devices rely on customer phones and vehicle indicators for customer user interface.
30 He also stated DC Chargers should be included with the item.
- 31 John Stokes, North Carolina, was not in support of this item.
- 32 The committee has reservations about having the customer cell phone as the sole indicating element for these devices.
- 33 The committee recommends the item be Withdrawn.
- 34 NEWMA 2023 Interim Meeting: A written statement from Siemens was provided and read during the comment period,
35 which is included on the NCWM website. A regulator from Holliston, Massachusetts commented that when the MOS

was approved for EV, it was specified that there be physical displays on the devices and what is being recommended is highly appropriate. A regulator from the Commonwealth of Pennsylvania questioned what ramifications would this cause for other display requirements across the board eg: gasoline. Other devices have proved they can have markings on displays in all kinds of weather and doesn't agree with the proposal. The States of Vermont, New Hampshire, New Jersey, New York, and the Commonwealth of Massachusetts agree with Pennsylvania that the display must appear on the device. Upon consensus of the body, the Committee recommends this item be Developing.

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-24.2 S.2.7. Indication of Delivery, N.5.2. Accuracy Testing., and T.2.1. EVSE Load Test Differences.

Source:

California Department of Food and Agriculture, Division of Measurement Standards

Purpose:

Change the exemption period for DC EVFS from 2028 to 2025.

Item under Consideration:

Amend Handbook 44 Electric Vehicle Fueling Systems Code as follows:

S.2.7. Indication of Delivery. – The EVSE shall automatically show on its face the initial zero condition and the quantity delivered (up to the capacity of the indicating elements).

All DC EVSE are exempt from this requirement until January 1, ~~2028~~2025.
(Amended 2022 and 2025)

And

N.5.2. Accuracy Testing. – 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.

(a) For AC systems:

(1) Accuracy test of the EVSE system at a load of not less than 85 % of the maximum deliverable amperes (expressed as MDA) as determined from the pilot signal for a total energy delivered of at least twice the minimum measured quantity (MMQ). If the MDA would result in maximum deliverable power of greater than 7.2 kW, then the test may be performed at 7.2 kW.

(2) Accuracy test of the EVSE system at a load of not greater than 10 % of the maximum deliverable amperes (expressed as MDA) as determined from the pilot signal for a total energy delivered of at least the minimum measured quantity (MMQ).

(a) For DC systems (see note):

(1) Accuracy test of the EVSE system at a load of not less than 85 % of the maximum deliverable amperes current (expressed as MDA) as determined from the digital communication message from the DC EVSE to the test standard for a total energy delivered of at least twice the minimum measured quantity (MMQ).

- (2) Accuracy test of the EVSE system at a load of not more than 10 % of the maximum deliverable amperes (expressed as MDA) as determined from the digital communication message from the DC EVSE to the test standard for a total energy delivered of at least the minimum measured quantity (MMQ).

All DC EVSE are exempt from this requirement until January, ~~2028~~2025.
(Amended 2022 and 2025)

And

T.2.1. EVSE Load Test Tolerances. – The tolerances for EVSE load tests are:

- (a) Acceptance Tolerance: 1.0 %; and
(b) Maintenance Tolerance: 2.0 %.

All DC EVSE are exempt from this requirement until January 1, ~~2028~~2025.
(Amended 2022 and 2025)

Previous Status:

2024: New Proposal

Original Justification:

The 2028 exemption was provided for DC EVFS due to the lack of available field test equipment that could accurately test and verify conformance of DC EVFS to established tolerances. Testing equipment capable of testing DC EVFS at the higher power levels of modern DC EVFS is now available and new manufactures of test equipment are entering the market now. The justification for the exemption for DC EVFS is no longer valid as regulating jurisdictions have access to test equipment that can properly evaluate installations of DC EVFS for conformance to the adopted specifications and tolerances. The availability of DC EVFS test equipment has been verified by two test equipment manufacturers and by research conducted by Argonne National Lab. With fully capable test equipment available in 2023 and 2024, establishing a 2025 effective is reasonable and provides a uniform, transparent, and equitable marketplace for both consumers and competing businesses.

T.2.1. Does not have any separate specifications for either AC or DC EVFS. It is intended to be applicable to all EVFS.

EVFS manufacturers and regulators agreed to a 2028 date due to lack of available testing equipment. During open hearings prior to adoption of the 2028 exemption date, industry representatives agreed that the 2028 could be amended once test equipment was available.

The submitter requested that this have Voting status in 2024 as nonretroactive provisions.

Comments in Favor:

Regulatory:

-

Industry:

-

Advisory:

-

Comments Against:

Regulatory:

-

Industry:

-

Advisory:

-

Neutral Comments:

Regulatory:

-

Industry:

-

Advisory:

-

Item Development:

New Proposal

Regional Associations' Comments:

New Proposal

CWMA 2023 Interim Meeting: Perry Lawton from TESCO spoke in support of the change of the date stating that the equipment will be available at the end of this year.

Theo Brillhart from Fluke support this modification in anticipating the equipment will be sufficiently available to inspectors using this timeline.

Scheleese Goudy from Electrify America is concerned that there is nothing beyond a prototype available at this time. Items should not be added to the Handbook in hopes we might be able to have equipment in the future because we might be creating a law that cannot be complied with. This item does not address legacy equipment. Electrify America recommends making this a developing item so that the submitter can address these concerns.

Mike Harrington from Iowa stated that he can be swayed either way and he believes the test equipment will be ready. He would not mind leaving the 2028 date in place. Recommend developing or informational while we await feedback from other regional meetings. Does not support voting status.

The committee recommends this item as a voting item.

WWMA 2023 Annual Meeting: Due to the WWMA S&T Committee Chairman being a submitter of this item, Matt Douglas (California Department of Food and Agriculture, Division of Measurement Standards) abstained from the committee during open hearing, committee work sessions, voting session, and subsequent deliberations.

During the WWMA 2023 annual meeting the following comments were received:

General comments from representatives of California and manufacturers of the test equipment were heard on the floor in support of this item being moved forward as a Voting item.

- 1 Scheleese Goudy (Electrify America): Questioned the meaning of the availability and lead time of the test
2 equipment. Expressed the concern of how to address legacy devices that are already installed and being used.
- 3 Francesca Wahl (Tesla): Echoed, Electrify America regarding the legacy device issue. Recommend this item be
4 given a Developing status.
- 5 Perry Lawton (TESCO): Clarified the availability of test equipment, it will be available in the first quarter of 2024.
- 6 Kevin Schnepf (California, Division of Measurement Standards): Legacy devices can be addressed by adding “Non-
7 Retroactive”.
- 8 Chris King (Siemens): Agreed with Electrify America and Tesla regarding concerns about the availability of the test
9 equipment, legacy equipment and recommended this item be given a Developing status.
- 10 The WWMA S&T Committee recommended that this item be assigned a Developing status to allow the submitter
11 the opportunity to consider the comments made on the floor and receive feedback from stakeholders.
- 12 During the voting session comments were received from Mr. Schnepf (CA DMS) requesting that the committee
13 reconsider the recommended developing status and change the item to a voting status.
- 14 Mr. Schnepf (CA. DMS) commented that the item is fully developed as there is nothing in this proposal that
15 requires any further explanation or data. He also commented that the item had majority support from membership
16 during open hearings for a voting status.
- 17 The WWMA S&T committee entered deliberations to discuss the request from the floor to amend the status of the
18 item from developing to voting. During deliberations, the committee reviewed the item and determined that the item
19 did have merit, was fully developed as presented in the agenda, and agreed with the motion to amend the status of
20 the item.
- 21 The WWMA S&T committee agreed with the motion to change the recommendation from a Developing status to a
22 Voting status for the item. It was moved, seconded, and voted on by the body. Furthermore, this committee
23 recommends the NCWM S&T Committee consider comments heard during open hearings, specifically the concerns
24 from industry regarding legacy devices and the potential addition of a nonretroactive date.
- 25 SWMA 2023 Annual Meeting: Perry Lawton, Tesco, was in support of this item.
- 26 Tim Chesser, Arkansas, was in support of this item.
- 27 Mauricio Mejia, Florida, was in support of this item.
- 28 Gene Robertson, Mississippi, supports this item.
- 29 ScheLeese Goudy, Electrify America, raised concerns what would happen with legacy equipment.
- 30 Alex Beaton, EVgo, echoed the statements of ScheLeese.
- 31 Patrick Bean, Tesla, agreed with Alex and ScheLeese’s comments and suggested waiting for test equipment to change
32 the date.
- 33 The committee recommends this item move forward as a Voting item.
- 34 NEWMA 2023 Interim Meeting: A representative from Tesco commented in support of the date change to 2025 as
35 equipment is readily available to allow testing. A representative from Electrify America expressed concerns on how

the date change would affect legacy devices. The States of New Hampshire, Vermont, New York, New Jersey and the Commonwealth of Massachusetts supports as voting. Upon consensus of the body, the Committee recommends this item be Voting.

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-23.4 D S.5.2. EVSE Identification and Marking Requirements, S.5.3. Abbreviations and Symbols, and N.5. Test of an EVSE System.

Source:

Power Measurements LLC

Purpose:

Update the details of the recommended tests in HB44 3.40 to better conform to current practice and Pub 14 instructions.

Item under Consideration:

Amend Handbook 44, Electric Vehicle Fueling Systems as follows:

S.5. Markings. – The following identification and marking requirements are in addition to the requirements of Section 1.10. General Code, paragraph G-S.1. Identification.

S.5.1. Location of Marking Information; EVSE. – The marking information required in General Code, paragraph G-S.1. Identification shall appear as follows:

- (a) within 60 cm (24 in) to 150 cm (60 in) from ground level; and
- (b) on a portion of the EVSE that cannot be readily removed or interchanged (e.g., not on a service access panel).

S.5.2. EVSE Identification and Marking Requirements. – In addition to all the marking requirements of Section 1.10. General Code, paragraph G-S.1. Identification, each EVSE shall have the following information conspicuously, legibly, and indelibly marked:

- (a) voltage rating;
- (b) maximum ~~current~~ deliverable amperes;
- (c) type of current (AC or DC or, if capable of both, both shall be listed);
- (d) minimum measured quantity (MMQ); and
- (e) temperature limits, if narrower than and within – 40 °C to + 85 °C (– 40 °F to + 185 °F). (Amended 2021)

S.5.3. Abbreviations and Symbols. – The following abbreviations or symbols may appear on an EVSE system.

- (a) VAC = volts alternating current;
- (b) VDC = volts direct current;
- (c) MDA = maximum deliverable amperes;

(d) ~~J=joule~~ Wh – kilowatt hours.

And

N.5. Test of an EVSE System.

N.5.12. Performance Verification in the Field. – Testing in the field is intended to validate the transactional accuracy of the EVSE system. Provided the EVSE under test has a valid type approval certificate, then ~~the~~ The following testing is deemed sufficient for a field validation.

(1) For AC EVSE

(i) A point between 10 % and 20 % of the maximum deliverable amperes, but not exceeding 8 A;

(ii) A point between 45 % and 55 % of the maximum deliverable amperes; and

(iii) A point between 70 % and 100 % of the maximum deliverable amperes.

(2) For DC EVSE

(i) A point at less than 30 A

(ii) A point between 20 % and 100 % of the maximum deliverable amperes with guidance to test at the maximum power level that is possible using the test equipment available.

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 provided that it is greater than 20 % of the maximum deliverable amperes.

All DC EVSE are exempt from this requirement until January 1, 2028.

(Amended 2023)

N.5.21. Laboratory Accuracy Testing. – 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).

(a) For AC systems:

~~(1) Accuracy tests of the EVSE system at a load of not less than 85 % of the maximum deliverable amperes (expressed as MDA) as determined from the pilot signal for a total energy delivered of at least twice the minimum measured quantity (MMQ). If the MDA would result in maximum deliverable power of greater than 7.2 kW, then the test may be performed at 7.2 kW. shall be performed at the following current levels:~~

(i) A point between 10 % and 20 % of the maximum deliverable amperes, but not exceeding 8A;

(ii) A point between 45 % and 55 % of the maximum deliverable amperes; and

(iii) A point between 70 % and 100 % of the maximum deliverable amperes.

~~(2) Accuracy test of the EVSE system at a load of not greater than 10 % of the maximum deliverable amperes (expressed as MDA) as determined from the pilot signal for a total energy delivered of at least the minimum measured quantity (MMQ).~~

(b) For DC systems ~~(see note)~~ tests shall be performed at two voltage points one between 350 VDC and 400 VDC and if supported by the EVSE a second at between 700 VDC and 800 VDC:

- (1) ~~Accuracy tests of the EVSE system at a load of not less than 85 % of the maximum deliverable amperes current (expressed as MDA) as determined from the digital communication message from the DC EVSE to the test standard for a total energy delivered of at least twice the minimum measured quantity (MMQ).~~ shall be performed at the following current levels:

(i) A point at less than 30A;

(ii) A point between 45 % and 55 % of the maximum deliverable amperes; and

(iii) A point between 70 % and 100 % of the maximum deliverable amperes.

- (2) ~~Accuracy test of the EVSE system at a load of not more than 10 % of the maximum deliverable amperes (expressed as MDA) as determined from the digital communication message from the DC EVSE to the test standard for a total energy delivered of at least the minimum measured quantity (MMQ).~~ (2) ~~Accuracy test of the EVSE system at a load of not more than 10 % of the maximum deliverable amperes (expressed as MDA) as determined from the digital communication message from the DC EVSE to the test standard for a total energy delivered of at least the minimum measured quantity (MMQ).~~

All DC EVSE are exempt from this requirement until January 1, 2028.

(Amended 2022 and 2023)

~~Note: 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. Circumstance, testing at the load presented by the vehicle shall be sufficient~~

Previous Action:

2023: New Item

Original Justification:

S.5.2:

Change (b) to maximum deliverable amperes because that is the term to be used throughout the document. Previously both terms had been used interchangeably.

S.5.3:

Joule is no longer used in the document. Replace with the abbreviation for kilowatt hours.

N.5:

When the HB44 code was originally written there had been no real experience in EVSE testing. Additionally, DC EVSE were quite new and power levels were low (typically 50kW) by today's standards where 350 kW systems are already deployed and megawatt systems are in discussion. The test points chosen at that time have been proven to be less than optimum to verify performance of the EVSE. Publication 14, which was developed later than HB44 adopted a set of test points similar to those proposed here. The tests proposed here have been extensively discussed in the NIST EVSE Working Group. However, that Work Group ran out of time for a formal vote to approve these proposals.

As background, the NIST WG is submitting Form 15s to start the restructuring of the test process. In those Form 15s the No Load and Starting load tests are removed from section 3.4. This proposal completes the restructuring of the EVSE testing.

Detailed review of proposed changes:

Logically section 5.2.1 should follow section 5.2.2 so both sections have been renumbered.

New 5.2.1:

In the new 5.2.1 (formerly 5.2.2) the word Laboratory was added to the title. As the power of both AC and DC EVSE has grown rapidly the equipment to test them at full power has become both large and expensive. It is perfectly reasonable for NTEP or a manufacturer to have this type of equipment but not reasonable for the average Weights and Measures inspector to have it available in the field. For that reason, this proposal breaks testing into two types: (1) testing for type verification done in a laboratory or at a manufacturer and (2) testing in the field for verification.

For testing AC systems in the laboratory three test points are proposed:

- (i) A point between 10 % and 20 % of the maximum deliverable amperes, but not exceeding 8A,
- (ii) A point between 45 % and 55 % of the maximum deliverable amperes,
- (ii) A point between 70 % and 100 % of the maximum deliverable amperes.

All test points are expressed in terms of a percent of the maximum deliverable amperes of the EVSE. For point (i) of the test a restriction has been added to ensure that high current chargers are tested near the nominal 6 A load that is the minimum charging current for most vehicles.

Today AC Level 2 chargers typically have maximum currents of 30 A to 80 A. Chargers with currents above 32 A were generally unavailable at the time HB44 3.4 was written. Several vehicles have recently been introduced that charge at 48 A. There is only one vehicle currently available that charges at 80 A. This test regime can be performed quickly. It can be performed on any AC Level 2 EVSE with test equipment commercially available and in the hands of multiple Weights and Measures authorities.

New 5.2.2:

Since HB44 3.40 was initially written a whole new generation of DC chargers have been developed. At that time the maximum power delivery was approximately 100 kW at 400 VDC. Today we have 350 kW systems operating at both 400 VDC and 800 VDC. The CCS EVSE standards have already been updated to allow chargers up to 1000 VDC and 800 A (800 kW). Because there are now two broad classes of DC EVSE; 400 VDC and 800VDC two voltage test points are included. Both voltage classes are capable of charging at 400V so a point between 350 VDC and 400VDC is required for both. For systems that can also operate at 800VDC a second point between 700 VDC and 800 VDC is required. Current points are to be tested at both voltages if they are appropriate for the EVSE.

For DC systems three test points are proposed:

- (i) A point at less than 30 A
- (ii) A point between 45 % and 55 % of the maximum deliverable amperes
- (iii) A point between 70 % and 100 % of the maximum deliverable amperes

This approach provides a test point at the lower end of the power transfer range where older vehicles may charge or where more modern EVs charge when topping off. The other two points are intended to bracket the power levels where most EV transfer most of their energy.

The power levels of DC EVSE are rapidly evolving to ever higher levels. For that reason, this change provides for flexibility in field testing of DC EVSE at the high power point. The high current point is revised to 20% to 100% of the maximum deliverable current **with guidance to test at the maximum power level that is possible using the test equipment available. The new code also provides for using a vehicle as the test load providing it meets the 20% of maximum deliverable current requirement.**

One objection might be the creation of a field testing regime for DC EVSE that is less rigorous than that applied in the laboratory. For many decades ANSI C12 meter testing has applied testing over the full range of voltage and current for meters during type testing but only done validation testing at two current values. For example, class 320 meters (320 A maximum current) are tested for accuracy at 11 points between 3 A and 320 A during type evaluation. However, for verification typically only two current points are used 5 A and 50 A.

Another objection might be the requirement to test 800 VDC EVSE at both 400 VDC and 800 VDC. Only a very few electric vehicles (three at this time) are capable of using 800 VDC charging. Therefore, even though an EVSE may be capable of 800 VDC operation because most EV operate at 400 VDC testing at 400 VDC on an 800 VDC capable system is appropriate.

The submitter requested that this be a Voting item in 2023.

Comments in Favor:

Regulatory:

- None

Industry:

- None

Advisory:

- None

Comments Against:

Regulatory:

- None

Industry:

- None

Advisory:

- None

Neutral Comments:

Regulatory:

- 2023 Interim: Mr. Kevin Schnepf (State of California, Division of Measurement Standards) recommends a developing status, recognizing the item has merit but needs more development. Mr. Schnepf recommends working with the NIST USNWG EVFE Subgroup on item development.

Industry:

- 2023 Interim: Mr. Keith Bradley (Electrify America) commented to one of the challenges in testing low current with the testing equipment. He expressed concerns with N.5.1.(b)(1)(i) and recommends a Developing status to evaluate the Note section.
- 2023 Interim: Ms. Francesca Wahl (Tesla) commented the item needs further development and recommends the submitter work with the NIST USNWG EVFE Subgroup on developing the item.
- 2023 Annual: Mr. Bill Hardy, Power Measurements, LLC-NIST USNWG SG is working on updated language.

Advisory:

- 2023 Interim: Ms. Tina Butcher (NIST OWM) commented there was no consensus from the NIST USNWG EVFE Subgroup on the item and encouraged the submitter to work with the Subgroup to evaluate the merit of the proposed testing criteria.

Item Development:

NCWM 2023 Interim Meeting: The Committee considered the comments heard during open hearings and assigned a Developing status to the item. The Committee recommends the submitter work with the NIST USNWG EVFE Subgroup for item development. The Committee discussed and changed the title to clarify the intent of the proposal.

NCWM 2023 Annual Meeting: The Committee heard from Bill Hardy, Power Measurements, LLC-NIST USNWG SG is working on updated language.

Regional Associations' Comments:

CWMA 2023 Interim Meeting: The committee heard comments on this item and item EVF 23.7 concurrently. Comments made about this item will also be found in the comments section on item EVF 23.7.

Theo Brillhart from Fluke presented material regarding the merge of EVF 23.4 and EVF 23.7 by the submitters as well as the passing of item EVF 23.1 at the 2023 Annual NCWM Meeting. The passing of item EVF 23.1 has forced a renumbering of sections within this current proposal. The submitters of EVF 23.4 and EVF 23.7 have reflected those changes in their proposal. With these changes (letter submitted), the submitter recommends this item as voting.

Scheleese Goudy from Electrify America agrees with the proposal because it makes testing easier. Language regarding '10 amps or above' fixes the concerns between item EVF 23.4 and item EVF 23.7.

Perry Lawton from TESCO applauds the work achieved between EVF 23.4 and EVF 23.7.

Steve Peter from Wisconsin supported this item.

The committee recommends this item moving forward as a voting item with the proposed changes by the submitter which are attached to the bottom of this report. [APPENDIX C]

WWMA 2023 Annual Meeting: During the WWMA 2023 annual meeting:

The Committee heard comments regarding item EVF-23.7 and this item. The WWMA S&T Committee received a letter with updated proposed language for this item and EVF-23.7. The letter has been posted to the WWMA website {Events – Meeting Documents – Letter from the Submitters EVF-23.4 and EVF-23.7}. This letter has also been provided to the NCWM S&T Committee.

Comments were heard from Theodore Brillhart (Fluke), Scheleese Goudy (Electrify America), Perry Lawton (Tesco), Francesca Wahl (Tesla), and Chris King (Siemens) supporting the proposed language in the Joint Letter dated August 22, 2023.

Mr. Kevin Schnepf (California Division of Measurement Standards): Supported this item with an additional proposed revision of changing the Exemption Date from 2028 to 2025.

The WWMA 2023 S&T Committee recommends this item be revised to reflect all proposed language in the Joint Letter dated August 22, 2023, and that the item remain Developing to allow all stakeholders the ability to review all proposed changes. This Committee recommends the withdrawal of item EVF-23.7 in favor of this item with the revisions per the letter.

The letter will be posted on the NCWM website.

SWMA 2023 Annual Meeting: ScheLeese Goudy, Electrify America, stated this was a joint proposal and will take the place of EVF-23.7.

Perry Lawton, Tesco, supported this item.

Juana Williams, NIST, the Test Procedures Sub-committee was asked to provide feedback on earlier combined proposal as well as an earlier proposal. They came back with 10 items they would like addressed and terms like optimal test load, convenient voltage, and optimal conditions.

The committee considered the proposed joint language from a letter dated August 22, 2023 from both submitters. The item itself still needs to be updated with this new language.

The committee recommends this item move forward as a Voting item.

NEWMA 2023 Interim Meeting: A representative from Electrify America provided a presentation on updates with this proposal. Comments were heard that the submitters of EVF-23.4 and 23.7 worked together on a joint proposal to come to a consensus on low end testing and specify minimum loads on DC meters. A representative from Tesco commented that the new proposal provides realistic testing constraints that will last and establishes minimums and parameters for “man in the middle” testing. Upon consensus of the body, the Committee recommends this item be Voting with the following changes:

Strike the entirety of N.3 and replace with:

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:

- (i) A point between 4 A and 10 A; and
- (ii) A point between 40 % and 60 % of the MDA; and
- (iii) A point between 70 % and 100 % of the MDA.

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:

- (i) A point between 10% and 20% of the MDA, but not less than 30 A;
- (ii) A point between 40 % and 60% of the MDA; and
- (iii) A point between 70 % and 100 % of the MDA.

N.3.3. Performance Verification in the Field of a DC EVSE

Accuracy tests shall be performed at any convenient voltage and the following current levels:

- (i) A point between 10% and 20% of the MDA, but not less than 30 A; and
- (ii) 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 equipment available.

Note: The test points (i) and (ii) 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 equipment 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 are exempt from this requirement until January 1, 2028.
Change S.3.2 (b) to read:

(b) Maximum current deliverable

Add S.3.3 (e) to read.

(e) MCD = Maximum current deliverable

Add the following definitions to Appendix D:

Maximum current deliverable: The maximum current that the EVSE can deliver as installed under optimum conditions.

Maximum deliverable amperage: The maximum current available from the EVSE at the time of the test as determined by the Control Pilot Pulse Width Modulation signal or via digital communication between the EVSE and EV or test equipment

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

EVF-23.6 S.5.2. EVSE Identification and Marking Requirements., and T.2. Tolerances.

Source:

Florida Department of Agriculture and Consumer Services; Electrify America; Tesla; EVGo, Siemens

Purpose:

The revised proposal would amend Handbook 44, Section 3.40 Tentative Code in the following ways:

1. Paragraph T.2.1 would be revised for DC chargers. The 1% (acceptance) / 2% (maintenance) tolerances would apply to devices installed after January 1, 2024. For devices installed before that date, the tolerances would be 5% (acceptance and maintenance).
2. For the sake of clarity and transparency for customers and inspectors, a device subject to the 5% tolerance would have to be marked as such. The proposal would require specific language for the marking.
3. If a manufacturer has achieved 1%-capable chargers earlier than the January 2024 timeframe, users of those chargers might prefer not to mark the chargers as 5% chargers; and then those chargers would be subject to the 1%/2% tolerance. The proposal includes language to establish this treatment.
4. The 5% tolerance for pre-2024 chargers would end on January 1, 2034. After that date, all DC chargers would be subject to the 1% (acceptance) / 2% (maintenance) tolerance.

Item under Consideration:

Amend Handbook 44, Electric Vehicle Fueling Systems as follows:

S.5.2. EVSE Identification and Marking Requirements. – In addition to all the marking requirements of Section 1.10. General Code, paragraph G-S.1. Identification, each EVSE shall have the following information conspicuously, legibly, and ~~indelibly~~ **permanently** marked:

- (a) voltage rating;
- (b) maximum current deliverable;
- (c) type of current (AC or DC or, if capable of both, both shall be listed);
- (d) minimum measured quantity (MMQ); and

(e) temperature limits, if narrower than and within – 40 C to + 85 C (– 40 F to + 185 F).

S.5.2.1. Marking of Accuracy Limits, DC EVSEs Installed Prior to 2024. - A DC EVSE installed and placed into service prior to 2024 shall be marked with the following:

NOTICE:

“This charger operates at a tolerance of up to +/- 5 percent versus other chargers which operate at a maximum tolerance of up to +/- 2 percent.”

This marking shall be conspicuously and legibly displayed in a position plainly visible to a person accessing a charging port of the EVSE. The indicating element may be used to display this notice, provided the notice is presented to the customer prior to the beginning of the transaction.

This marking requirement does not apply to DC EVSEs that are capable of meeting an acceptance tolerance of +/- 1 percent and a maintenance tolerance of +/- 2 percent.

(Added 202X)

T.2. Load Accuracy Test Tolerances.

T.2.1. EVSE Load Accuracy Test Tolerances for AC Systems. – The tolerances for EVSE load tests **for AC Systems** are:

(a) Acceptance Tolerance: 1.0 %; and

(b) Maintenance Tolerance: 2.0 %.

T.2.2. EVSE Load Accuracy Test Tolerances for DC Systems. -- The tolerances for EVSE load tests on DC systems shall be as follows:

(a) For DC systems installed and placed in service prior to January 1, 2024, and that bear the notice specified in paragraph S.5.2.1. Marking of Accuracy Limits, DC EVSEs installed and placed in service prior to 2024, acceptance and maintenance tolerances are: 5.0 percent. This paragraph T.2.2(a) shall expire on January 1, 2034; after that date, all DC EVSEs shall be subject to the tolerances of paragraph T.2.2(b).

(b) For DC systems installed and placed in service on or after January 1, 2024, or that do not bear the notice specified in paragraph S.5.2.1. Marking of Accuracy Limits, DC EVSEs installed and placed in service prior to 2024 tolerances are:

(1) Acceptance Tolerance: 1.0 percent; and

(2) Maintenance Tolerance: 2.0 percent.

All DC EVSE are exempt from this requirement **paragraph T.2.2** until January 1, 2028.

Previous Action:

2023: New Item

Original Justification:

A. The effect of the proposed revisions

The changes we propose would work as follows: All DC chargers would remain exempt from the accuracy tolerances until January 1, 2028, as NCWM adopted at the 2022 annual meeting. When accuracy tolerances come into force, a DC charger installed after January 1, 2024, would have to satisfy the 1% (acceptance) / 2% (maintenance) tolerance, the same levels as for AC chargers. But a DC charger installed before January

1, 2024, would have to meet only a 5% accuracy tolerance. That 5% accuracy tolerance would expire on January 1, 2034, at which point all the legacy chargers will have to have been retrofitted or replaced.

The proposal would require a charger that is subject to the 5% tolerance to display a marking, with specified language, informing customers and inspectors of that fact. But the proposal leaves open the possibility that a given manufacturer might achieve the 1%/2% tolerance earlier, and then would specify that capability for a given model. Devices in that model would not have to be marked as 5% devices; but if they are not marked that way, they would of course be subject to the 1%/2% level as for new chargers.

B. The basic justification

DC and AC chargers are fundamentally different—in technology, in customer use, and in metering capabilities. AC charging technology, the older form, delivers energy in the same form—voltages and currents oscillating at 60 Hertz (in the United States) as utilities have provided it for a century. Because a vehicle has to convert AC energy to DC for charging the battery, AC charging stations operate at no more than 19.7 kW, and most no more than 6-7 kW. These charging rates will add 24-80 miles of range in an hour of charging a typical car, and consequently AC charging involves extended sessions—the median time that a customer uses an AC station is 22 hours.³ The voltages delivered are no more than 480 volts ac, and the current is no more than 50 amps ac (and more typically 30 amps ac). By contrast, DC chargers deliver energy in the same form that a battery ultimately needs it. Using voltages of 400 to 950 volts dc and currents up to 500 amps dc (higher levels are coming in the future for applications like charging heavy trucks), they are able to deliver 50 kW, 150 kW, 350 kW, or higher charging rates. These stations will add 200-1400 miles of range in an hour of charging, or, more meaningfully, 400 miles of range in as little as 20 minutes. A customer at a DC station will arrive, charge briefly, and then depart. Customers incorporate AC chargers into their regular routines, such as by driving to work and charging there. DC chargers are more commonly used to support long-distance trips.⁴

For AC charging, manufacturers have been able to utilize metering technology that has been developed over a century for electric utilities. When Handbook 44, section 3.40 was developed in 2015, that AC metering technology was well understood. There have been long-established standards for AC revenue meters—though those standards, in the utility sector, are not necessarily the same in every respect as how a weights and measures standard would work.

One indication of the relatively mature state of AC metering is that NIST has long provided ordinary-course calibration services for AC watt-hour meters that operate at 60 Hertz, within ranges of 69 to 480 volts and 0.5 to 30 amps (sufficient to cover typical AC chargers).⁵ DC metering technology, by contrast, has been “in research and development.”⁶ When section 3.40 was adopted, the accuracy tolerances of 1.0% (acceptance) and 2.0% (maintenance) were predictive and aspirational for DC chargers. As of November 2019, when California adopted its own regulation based on section 3.40, meters and chargers meeting that standard were not yet generally commercially available.⁷ Meanwhile, NIST calibration services for DC watt-hour meters are non-standard, and are available only up to 240 volts and 5 amps⁸—far below the levels needed for testing DC chargers.

Argonne National Lab has studied the availability of DC metering technology. Our understanding is that its draft report (not yet finalized, so far as we are aware) concludes that there are now on the market (at

³ Idaho National Laboratory, “Plugged In: How Americans Charge Their Electric Vehicles,” p.14, <https://avt.inl.gov/sites/default/files/pdf/arra/PluggedInSummaryReport.pdf>.

⁴ As the California Energy Commission has explained, “it is therefore useful to treat infrastructure for interregional travel (predominantly DCFCs) differently from infrastructure for intraregional travel (predominantly Level 1 and Level 2 chargers).” <https://efiling.energy.ca.gov/GetDocument.aspx?tn=233986&DocumentContentId=66805> at page 14.

⁵ https://shop.nist.gov/ccrz/ProductDetails?sku=56200C&cclcl=en_US.

⁶ Cal. Dep’t of Food & Agriculture, Final Statement of Reasons on Electric Vehicle Fueling Systems, p.23 (Nov. 1, 2019).

⁷ Id.

⁸ https://shop.nist.gov/ccrz/ProductDetails?sku=56110S&cclcl=en_US.

least in principle) meters for use in DC chargers that can meet a 1% acceptance / 2% maintenance tolerance. It is reasonable to conclude that the 1% / 2% tolerance will be achievable in general. The current proposal is focused on how to handle the chargers that are installed before that point. Previously installed chargers will not in general be able to satisfy a 1% / 2% accuracy tolerance. To be clear, we do not suggest that every existing charger would be more than 2% inaccurate. Indeed, it would not genuinely be possible to make that assessment, given the lack of NIST-traceable measurement apparatus to test fast DC chargers in the field.

There is presumably a distribution of potential deviations among devices in the field. Given what metering technology has been commercially available, a 2% maintenance accuracy would lead to inspection problems for a high proportion of devices.

The proposal would establish a tolerance of 5% for devices installed before January 1, 2024. The justification for this particular choice of tolerance and timeline is as follows:

1. In 2019, California adopted a regulation that put a modified version of section 3.40 into force for new devices. DC chargers installed before January 2023 are subject to no weights and measures standards at all until 2033. DC chargers installed after January 2023 (and before January 2033) are subject to a maintenance tolerance of 5.0% (and acceptance tolerance of 2.5%). Consequently, in California, which represents roughly 30% of the currently-existing base of DC chargers, the maintenance tolerance will be 5.0% for the coming decade. A maintenance tolerance of 5.0% for legacy chargers in section 3.40 will be stricter overall than the California regulation (because it will apply to all legacy chargers, whereas the California standard applies only to post-2023 chargers), but will align with the numerical tolerance used in California. Although a 5.0% tolerance is among the larger tolerances used in Handbook 44, it is not unprecedented. And the fact that new chargers in California will be subject to that standard will mean EV charging customers have substantial experience with that chargers at that tolerance, and the 5.0% tolerance we propose would be the same transactional experience as customers in California (the largest EV charging market in the country) receive. It bears mention, too, that as Measurement Canada prepares to implement standards for AC chargers, the tolerance (acceptance and maintenance) will be 3.0%, not the 1% acceptance in Handbook 44. The cost of a typical charging session is \$15 to \$20. A 5.0% maintenance standard would mean a variation, beyond that, of an additional plus or minus 40 cents. As with any tolerance, that variation could at any given charger be for or against either side to the transaction.
2. The industry submitters have studied carefully their existing chargers, measurement devices and existing models now available. They believe the 5% maintenance tolerance is achievable at a manageable cost in the future, because it will generally not require extensive reconfiguring of cabinets and the installation of four-wire cables.
3. The cost of bringing legacy chargers into line with the 1%/2% standard would be extreme. Although equipment is not available to test DC fast chargers in the field, some operators have found in tests of existing devices that they can be brought to a 5% tolerance, but cannot meet the 1%/2% standard without replacing the meters or implementing an entirely new measurement system, which means a physical reconfiguration at each station and/or replacing the cables for delivering the energy to vehicles. Section 3.40 standards are based on the energy delivered at the connector to the car; in other words, a charger must account for losses in the cables. The most straightforward way to account for losses is to measure the voltage at the vehicle connector; that means the cable must have two additional high-voltage leads, to carry that voltage back to the meter.⁹ In California's Initial Statement of Reasons (ISOR) for adopting specifications and tolerances requirement for commercial EVSE, California estimated that it costs approximately \$20,000 to retrofit an existing DC charger.¹⁰

⁹ Charging cables are themselves complex objects, with liquid coolant and high-voltage insulation. Cables for fast DC chargers that include additional high-voltage sensing leads were not available in 2015.

¹⁰ https://www.cdfa.ca.gov/dms/pdfs/regulations/EVSE_ISOR.pdf.

We understand that cost to represent the cost (parts and labor) to replace the charging cable, and possibly to replace the meter if that task is simple. This cost may be a significant underestimate for some models of charger, because replacing the meter may not always be possible without physical reconfiguration of the space within the charger. Which charger models would require that sort of reconfiguration, and what proportion of the installed base they represent, is impossible to know without a detailed model-by-model study and detailed model-by-model installation data across manufacturers. The upper end of cost would be simply the cost of replacing a charger, which many operators would find preferable to physical reconfiguration of charger internals anyway. The International Council on Clean Transportation (“ICCT”) reported in 2019 that fast DC chargers cost between \$75,000 and \$140,000 per charger, for the charger itself.¹¹ Installation costs range from \$18,000 per charger (for six 150 kW chargers at a site) to \$65,000 per charger (for one 350 kW charger at a site).¹² The total cost (installation and equipment) for a 4-charger site would be roughly \$720,000. That said, some amount of the installation cost represents upgrades to electrical supply lines and basic site construction, costs that would not be incurred anew to replace equipment. So for a rough estimate, it is appropriate to use the lowest cost estimate from the ICCT, which is \$17,692 (the cost per charger for a large site of 50 kW chargers). With that figure, replacing a 4-charger site of 350 kW chargers would cost roughly \$630,000, or \$157,000 per charger.

4. Based on data on the existing charge base from the National Renewable Energy Laboratory’s Alternative Fuels Data Center (“AFDC”), we can assume there will be about 36,000 “pre-2024” DC chargers.¹³ These are only a fraction of the overall chargers that will be installed nationwide over the coming decade, but bringing them into compliance with a 1%/2% tolerance will be highly costly. Taking out the 30% that are in California (which already has regulations with a 5.0% maintenance tolerance, for all post-2023 DC chargers), retrofitting all of those at the \$20,000 cost would total \$720 million. If meter replacement is not possible and those chargers must all be replaced, the total would be \$5.6 billion. The actual cost of bringing the pre-2024 chargers to compliance with a 2.0% maintenance tolerance would be somewhere between these numbers.¹⁴
5. The January 2024 date moves faster than the California regulation. Under the California regulation, the 1% / 2% tolerance would not come into force until 2033. It appears that meters capable of that tolerance are now available on the market. The submitters propose January 2024 as the date for distinguishing “legacy” from “new” chargers, because the existence of these meters on the market is not all that is needed. Manufacturers have to access the meters, design products incorporating them; revise production lines; test the new products to ensure they are safe and reliable; and obtain third-party certifications (such as from Underwriters Laboratory) of the revised products. After those steps, a manufacturer can begin delivering a revised product to operators. Installation of a charger is not simply a matter of placing it on a counter; charging sites involve construction work, leading to the secure attachment of a charger to a specially built concrete pad. In other words, from the first delivery of a new model of charger to the first installations of those chargers also takes time. The January

¹¹ Michael Nicholas, “Estimating electric vehicle charging infrastructure costs across major U.S. metropolitan areas,” ICCT Working Paper 2019-14, p.2 tab. 2 (Aug. 2019), https://theicct.org/sites/default/files/publications/ICCT_EV_Charging_Cost_20190813.pdf.

¹² Id. at 4 tab. 4.

¹³ According to the AFDC’s station locator database, there are 6,580 DC stations with 22,767 chargers. The AFDC also reports that the number of DC ports grew 29% year-on-year to the second quarter of 2021. https://afdc.energy.gov/files/u/publication/electric_vehicle_charging_infrastructure_trends_second_quarter_2021.pdf. With growth at this rate, about 6,600 additional DCFC stations will be installed in 2022 and 2023, leading to a total of about 36,000 DC chargers that would be “pre-2024” chargers under the proposal.

¹⁴ A charger that is not qualified for a given tolerance level may well be within the bounds of the tolerance, because there is some distribution in metering performance. Even if devices are replaced only after inspection, a significant fraction would need replacement, thus incurring this scale of cost. Moreover, it might be most sensible for an operator to ensure all its devices are qualified, rather than waiting to see what the results of inspection might be for a given charger.

2024 date is appropriate for expecting new chargers to incorporate meters that were available a few years before that date.

6. The proposal focuses on installation before January 2024, rather than using the concept of retroactive/non-retroactive that is more common in Handbook 44, because non-retroactive is ordinarily based on when a device is placed in service. Many states do not yet regulate EV chargers and consequently have no placed-in-service process. In these states, “placed in service” would not be a well-defined concept, and regulators might not have good ways to determine when a device was placed in service. Installation is a reasonably well-defined process, and it should be possible to identify when a given charger was installed. California’s regulation has differing status for pre-2023 and post-2023 chargers, and it bases that line on installation.
7. The proposal also specifies 5.0% as the acceptance tolerance, not just the maintenance tolerance. As a practical matter in field inspections, the acceptance tolerance for pre-2024 chargers will not be important. Section 3.40 (as amended at the 2022 NCWM meeting) exempts DC chargers from the accuracy tolerance until 2028. When they become subject to accuracy tolerances, no pre-2024 charger will be at the point of acceptance. The proposal specifies an acceptance tolerance for clarity in type evaluations, which ordinarily evaluate device models against the applicable acceptance tolerance.
8. The exemption until 2028 adopted at the 2022 meeting does not eliminate the need for this proposal. When DC chargers are subject to accuracy tolerance requirements, pre-2024 chargers will still need to meet the applicable tolerance or be retrofitted or replaced. The 2028 time frame is unreasonably soon to do that, given the cost estimates above. California estimated that chargers have an effective 10-year lifespan.¹⁵ This estimate is highly uncertain, in part because it was based in part on older AC chargers. Newer DC chargers, using more advanced technology for significantly more expensive equipment, are likely to have usable lifetimes greater than 10 years. The proposal recognizes that, nonetheless, there is a tradeoff between the cost of retrofitting or replacing devices, and the value of tighter tolerances. Some number of chargers will fail and need replacement earlier than 10 years, thus reducing the number that eventually need to be retrofitted or replaced to comply with tighter accuracy tolerances. Overall, the proposal uses the same 10- year period that several states have already adopted.¹⁶ Notably, the effect is significantly more stringent than in the California regulation. Under California’s rule, a charger installed before 2023 is subject to no standards for 10 years, and then becomes subject to standards in 2033; a replacement of the charger in 2032 would be subject to the 5.0% maintenance tolerance. A charger installed in 2023 (and that hypothetical 2032 installation) would be subject to the 5.0% tolerance indefinitely, with no end point. Our proposal, by contrast, would make a pre-2024 charger subject to the 5.0% tolerance once the 2028 compliance dates kicks in but only until 2034, at which point the charger would have to be retrofitted, replaced, or otherwise brought to the 1%/2% tolerance.

C. Potential objections

In response to the industry’s original proposal, some people commented that AC and DC chargers should be treated the same. As explained above, they are not the same, not only because of technology differences but also because customers use them and view them differently. California and NTEP have distinguished AC and DC chargers since at least 2021, and NCWM has already recognized important differences between them, in Handbook 44.

Some have also commented that there should not be parallel accuracy classes for a given application. But this approach is not unprecedented. In 1986, NCWM required new scales to be marked with an accuracy class. Pre-1986 scales could remain unmarked, and those unmarked scales were subject to various accuracy

¹⁵ Cal. Dep’t of Food & Agriculture, Final Statement of Reasons, p.6.

¹⁶ 4 Cal. Code of Regulations § 4002.11; Rev. Code Wash. § 19.94.190(6).

tolerances (depending on application) that ranged up to 5.0%, compared to the largest tolerance for any marked scale at 2.0%. For grain moisture meters, Handbook 44 has completely separate sections for pre-1998 and post-1998 devices, with some different tolerance specifications for older and newer devices. For both scales and grain moisture meters, there was no sunset date; the older devices have been allowed to continue in use for as long as they operated. We do not suggest that the circumstances with EV chargers are the same. Each of those past examples was based on justifications particular to that situation. Nonetheless, these examples show that it has been done to maintain parallel tolerances for a given application. In addition, there are already parallel, differing tolerances for EV chargers. If the proposal is not adopted, pre-2023 chargers in California will have no tolerance at all until 2033; post-2023 chargers will have a 5.0% maintenance tolerance for the indefinite future; and chargers elsewhere in the country, including in states neighboring California, will have the existing Handbook 44 tolerances. The proposal shifts the line between differing tolerances, but the situation of differing tolerances for the same application is already in place without the proposal.

There have been claims that some manufacturers may be able to achieve 1% devices (DC chargers) before January 2024, and one or more may already have done so. Even so, the proposal is still warranted. Operators of EV chargers should not be forced to replace their existing chargers simply because they could not get access to chargers made by a given manufacturer. It is generally agreed that when section 3.40 was adopted, the equipment to satisfy it did not exist for DC chargers. Reaching that point has required research and development by meter manufacturers and charger manufacturers. The goal of regulation should be to handle the technology transition in a reasonable, fair manner, without prejudice to operators that have made diligent efforts in procurement and operation of their chargers.

This proposal arrives without the formal approval of the U.S. National Work Group subgroup on EV charging. But a similar proposal did have general consensus at the Work Group. NIST personnel solicited views on the proposal through an email ballot at the end of June 2022. The resulting votes were 11 in favor, and 1 opposed. As of this filing, NIST has not provided information on whether this vote was sufficient for the subgroup to formally endorse the proposal. The one person voting “no” said that the person would have voted yes if the proposal included a 10-year end date for the 5% tolerance. The current proposal has that feature and thus addresses the only concern expressed by the sole “no” vote.

Comments in Favor:

Regulatory:

- 2023 Interim: Mr. Craig VanBuren (Michigan Department of Agriculture) supports the item as voting with submitted edits.
- 2023 Interim: Mr. Hal Prince (Florida Department of Agriculture and Consumer Services) supports the item as Voting, adding the EVF-23.5 is not complete and is missing needed language. Mr. Prince expressed the item is critical and is willing to work with the NIST USNWG EVFE Subgroup to move the item forward.
- 2023 Interim: Mr. Mahesh Albuquerque (Colorado Division of Oil and Safety) supports developing the item with suggestive edits, striking language in T.2.2.(b).
- 2023 Annual: Craig VanBuren (Michigan) states that the item meets his state needs and supports the item.
- 2023 Annual: James Cassidy (Massachusetts) in support of the item and feels strongly about moving the 2028 date to 2024 or 2025.
- 2023 Annual: Daniel Walker (Ohio) supports the item with digital notification.
- 2023 Annual: Steve Timar (New York) supports the item.
- Mauricio Mejia (Florida) supports the item and pointed out that the 2028 date is current code already in Handbook 44 and can be changed as the testing equipment is developed.
- Jason Flint (New Jersey) supports the item with the modifications proposed by the CWMA that allows digital display of the notice.

- Walt Remmert (Pennsylvania) commented the dates make sense and are a reasonable solution.
- Stephen Benjamin (North Carolina) supports the item.

Industry:

- 2023 Interim: Mr. Keith Bradley (Electrify America) commented on the 5% tolerance proposed in the item. Mr. Bradley referenced the October 15, 2022 letter submitted to the Committee and added the item does not create a conflict with the tolerances and the 2028 date.
- 2023 Interim: Ms. Francesca Wahl (Tesla) agreed with Mr. Bradley's comments and supports a Voting status.
- 2023 Annual: Keith Bradley (Electrify America) commented that DC chargers are newer and are going through constant change and updates with metrology capabilities supports the item.
- 2023 Annual: Francesca Wahl (Tesla) supports the item and noted that when the EV code was adopted in 2022 it established that all EV charges would be compliant by 2034. Any legacy charger that does not have the 5% statement would automatically have a 2% tolerance.
- 2023 Annual: Jared Ballew (ChargePoint) supports the language in the CWMA report and believes the 5% statement should be displayed digitally on the device.
- 2023 Annual: Alex Beaton (EVgo) supports the item and stated that if the device isn't marked with the 5% statement, it gets the 2% tolerance.
- Tom Lawton (TESCO) supports the tolerances and thinks the industry should come to a consensus on the dates. He commented TESCO is in the process of testing equipment and the 2028 date is not necessary for his company.

Advisory:

- None

Comments Against:

Regulatory:

- 2023 Annual: Kevin Schnepf (California) does not see the benefit of having a 2024 and a 2028 date and recommends withdrawal of the item.
- 2023 Annual: Stan Toy (Santa Clara County, CA) request making the item informational or withdrawal.
- 2023 Annual: Paul Floyd (Louisiana) supports the tolerance but does not support putting the notice on the item. Mr. Floyd stated he does not want to put a seal on a device that advertises a wider tolerance.

Industry:

- None

Advisory:

- None

Neutral Comments:

Regulatory:

- 2023 Interim: Mr. Kevin Schnepf (State of California, Division of Measurement Standards) suggests replacing the word "installed" with "installed and placed in service" in paragraph T.2.2.(a) and T.2.2.(b).
- 2023 Interim: Mr. Keith Bradley (Electrify America) responded to Mr. Schnepf's comment, noting not all jurisdictions have requirements for place in service.

Industry:

- None

Advisory:

- 2023 Interim: Ms. Tina Butcher (NIST OWM) referred to the written comments submitted by NIST OWM and commented on the formatting and dates in paragraph T.2.2. (b); adding the language in this paragraph should be made clearer. Ms. Butcher expressed support for EVF-23.5 and found EVF-23.6 confusing.
- 2023 Annual: Loren Minnich (NIST OWM) stated the item needed more work and should be informational. OWM has an issue with the three differing dates that appear in the proposal as they could be confusing and lead to enforcement issues.

Item Development:

NCWM 2023 Interim Meeting: The Committee considered the comments heard during open hearings and has assigned a Voting status to the item. The Committee worked on modifying the item based on the comments heard during open hearings and written comments submitted by NIST OWM.

NCWM 2023 Annual Meeting: The Committee considering comments from the floor and modified the item to match that proposed by the CWMA. The Committee agreed to make the item voting not changing any dates in the proposal. The item did not receive enough votes to pass or fail. The item was returned to committee.

Regional Associations' Comments:

CWMA 2023 Interim Meeting: Scheleese Goudy from Electrify America presented on this item. Scheleese recommends this as a voting item with revisions.

Mike Harrington from Iowa supports item with changes and that we should not put accuracy markings regarding tolerances on the meter because we might need to then do that for all devices. Tolerances are currently public information and consumers can find them if needed. Accuracy class marking will help inspectors know what tests/tolerances to apply and should be on the devices. Mike supports this item as voting.

Greg VanderPlaats from Minnesota supported this item at the 2023 NCWM Annual Meeting. The language in this updated proposal is better than the previous version. Greg supports as a voting item.

The committee recommends this item as a voting item with the following changes:

S.5.2. EVSE Identification and Marking Requirements. – In addition to all the marking requirements of Section 1.10. General Code, paragraph G-S.1. Identification, each EVSE shall have the following information conspicuously, legibly, and ~~indelibly~~ **permanently** marked:

- (a) voltage rating;
- (b) maximum current deliverable;
- (c) type of current (AC or DC or, if capable of both, both shall be listed);
- (d) minimum measured quantity (MMQ); and
- (e) temperature limits, if narrower than and within – 40 °C to + 85 °C (– 40 °F to + 185 °F).

S.5.2.1. Marking of Accuracy Class, DC EVSEs Placed in Service Prior to 2024. - A DC EVSE that was placed into service prior to 2024 and is subject to the tolerances of T.2.2(a) is an accuracy Class 5 EVSE, and shall be marked with Class 5. The marking shall be conspicuously and legibly displayed in a position plainly visible to a person accessing a charging port of the EVSE. The indicating element may be used for the marking, provided the marking is visible to the customer prior to the beginning of the transaction.

(Added 202X)

T.2. Test Tolerances.

T.2.1. EVSE ~~Load~~ **Accuracy** Test Tolerances for **AC Systems**. – The tolerances for EVSE load tests **for AC systems** are:

- (a) Acceptance Tolerance: 1.0 %; and
- (b) Maintenance Tolerance: 2.0 %.

T.2.2 EVSE Accuracy Test Tolerances for DC Systems. -- The tolerances for EVSE load tests on DC systems shall be as follows:

(a) For a DC system that was placed in service prior to January 1, 2024, and that is marked Class 5, acceptance and maintenance tolerances are: 5.0 %. This paragraph T.2.2(a) shall expire on January 1, 2034; after that date, all DC EVSEs shall be subject to the tolerances of paragraph T.2.2(b).

(b) For any DC system not subject to paragraph T.2.2(a), tolerances are:

(1) Acceptance Tolerance: 1.0 %; and

(2) Maintenance Tolerance: 2.0 %.

All DC EVSE are exempt from this requirement until January 1, 2028.

WWMA 2023 Annual Meeting: During the WWMA 2023 annual meeting:

Updated language to this item was provided to the WWMA S&T Committee and posted to the WWMA website, {Events – Meeting Documents – EVF-23.6 Proposal}.

A presentation was given by the submitters of this item. The submitters spoke to:

- 5% tolerance for legacy devices
- Marking requirement of class 5 based on comments received during the 2023 NCWM Annual Conference.

General comments from industry supported a Voting status with the updated language.

Kevin Schnepf (California, Division of Measurement Standards): Supports this item with the recommended revision of the Exemption Date from 2028 to 2025.

Mahesh Albuquerque (Colorado, Division of Oil and Public Safety): Supports this item as Voting status.

Comments from regulatory officials were heard regarding the concern of the language “placed into service” and the removal of the language of “Install” with the potential effect to “legacy devices” being used in the marketplace.

Lenny Vang (EV Testing Solutions): Questioned where the data on the 5% tolerance resulted from and requested from the submitter the data to justify the 5% tolerance.

Scheleese Goudy (Electrify America): Clarified that the tolerances were aligned originally with California standards and existing devices in use.

Questions were raised about whether the marking requirement of “Class 5” is fully informative to a consumer.

The WWMA 2023 S&T Committee recommends this item be assigned a Developing status with the recommendation the submitter consider comments heard on the floor. This committee notes there are two items on the 2023 WWMA S&T agenda that propose changes to section T.2 Load Test Tolerances (also see EVF-24.2).

Updated language will be posted on the NCWM website.

1 SWMA 2023 Annual Meeting:

The committee recommends the following language as a replacement for the above item:

S.5.2. EVSE Identification and Marking Requirements. – In addition to all the marking requirements of Section 1.10. General Code, paragraph G-S.1. Identification, each EVSE shall have the following information conspicuously, legibly, and **permanently** ~~indelibly~~ marked:

- (a) voltage rating;
- (b) maximum current deliverable;
- (c) type of current (AC or DC or, if capable of both, both shall be listed);
- (d) minimum measured quantity (MMQ); and
- (e) temperature limits, if narrower than and within –40°C to +85°C (40 F to +185°F).

S.5.2.1. Marking of Accuracy Class, DC EVSEs Placed in Service Prior to 2024. - A DC EVSE that was placed into service prior to 2024 and is subject to the tolerances of T.2.2(a) is a Class 5 EVSE, and shall be marked with Class 5. The marking shall be conspicuously and legibly displayed in a position plainly visible to a person accessing a charging port of the EVSE. The indicating element may be used for the marking, provided the marking is visible to the customer prior to the beginning of the transaction. (Added 202X)

T.2. ~~Load~~ **Accuracy** Test Tolerances.

T.2.1. EVSE ~~Load~~ **Accuracy** Test Tolerances for **AC Systems**. – The tolerances for EVSE load tests **for AC systems** are:

- (a) Acceptance Tolerance: 1.0 %; and
- (b) Maintenance Tolerance: 2.0 %.

T.2.2 EVSE Accuracy Test Tolerances for DC Systems. -- The tolerances for EVSE load tests on DC systems shall be as follows:

(a) For a DC system that was placed in service prior to January 1, 2024, and that is marked Class 5, acceptance and maintenance tolerances are: 5.0 %. This paragraph T.2.2(a) shall expire on January 1, 2034; after that date, all DC EVSEs shall be subject to the tolerances of paragraph T.2.2(b).

(b) For any DC system not subject to paragraph T.2.2(a), tolerances are:

- (1) Acceptance Tolerance: 1.0 %; and**
- (2) Maintenance Tolerance: 2.0 %.**

All DC EVSE are exempt from this requirement until January 1, 2028.

Paul Floyd, Louisiana, supports the revised item.

Mrs. Goudy gave a presentation of this item and supports the revision along with the other submitter and requests the NCWM S&T committee revise the item to the included language. She also stated the 5% tolerance because the

2% tolerance is unobtainable for legacy devices. She suggested the date change 2028 to 2025 remain a separate item. Ms. Goudy also stated that industry would roll out the marking requirements via the indicating element.

Mauricio Meija, Florida, supported this item.

Tim Chesser, Arkansas, supported this item.

Steve Benjamin, NC, stated support for this item.

John Stokes, South Carolina, asked whether jurisdictions had considered treating EVF as a service rather than a motor fuel.

Tim Chesser responded to Mr. Stokes that Arkansas views it as both, and both would fall under Weights and Measures jurisdiction.

Paul Floyd, LA, responded to Mr. Stokes, that Louisiana has redefined retail electricity meters as a commercial weighing and measuring device.

Alex Beaton, EVGo, stated that they will work hand in glove with the manufacturer to make adding the marking requirement seamless and requested a voting status for the item.

Juana Williams, OWM, stated that that NIST has some concern that the use of multiple dates will cause confusion, and cautioned moving forward without considering past discussions on digital markings.

Perry Lawton, Tesco, supported changing the date from 2028 to 2025.

The committee recommends this item move forward as a Voting item using the above language.

1
2 NEWMA 2023 Interim Meeting: A presentation was given by a representative from Electrify America which
3 described that this proposal would create a Class 5 EVSE device, which would alleviate concerns of having a tolerance
4 percentage on the face of the device and requested a voting status. Regulators from the Commonwealths of
5 Pennsylvania and Massachusetts, and the States of Vermont and New Jersey support the changes as they would address
6 the legacy devices. A regulator from the State of New Hampshire commented that there are concerns with “placed in
7 service” vs “installed”. When something is placed in service, it may have been installed 10 years prior. A regulator
8 from Holliston, Massachusetts questioned if the 2034 date is more of a convenience of manufacturers or a benefit to
9 consumers and how are they supposed to know what a Class 5 means. He also questioned if the number is to be in
10 Arabic or Roman numeral form. Regulators from the State of New York commented that he has concerns same as
11 New Hampshire. They prefer installed date, not placed in service, do not think Class 5 is transparent to consumers,
12 and questioned if it should be a user requirement instead of design requirement. Upon consensus of the body, the
13 Committee recommends this item be Developing.

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

16 **EVF-23.7 D ~~N.1. No Load Test, N.2. Startin Load Test., N.5.2. Accuracy Testing, And~~**
17 **Appendix D: maximum deliverable amperes.**

18 **Source:**
19 Electrify America

20 **Purpose:**

The proposal would have the testing conducted at the contemplated 10%. Because it is unlikely that tests would actually be at precisely 10%, the proposal would allow testing in a small range slightly above 10%.

Item under Consideration:

Amend Handbook 44 Electric Vehicle Fueling Systems Code as follows:

N.1. ~~No Load Test.~~ ~~A no load test may be conducted on an EVSE measuring system by applying rated voltage to the system under test and no load applied.~~

N.2. ~~Starting Load Test.~~ ~~A system starting load test may be conducted by applying rated voltage and 0.5 ampere load.~~

N.5.2. Accuracy Testing. –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.

(a) For AC systems:

(1) Accuracy test of the EVSE system at a load of not less than 85 % of the maximum deliverable amperes ~~(expressed as MDA) as determined from the pilot signal~~ for a total energy delivered of at least twice the minimum measured quantity (MMQ). If the MDA would result in maximum deliverable power of greater than 7.2 kW, then the test may be performed at 7.2 kW.

(2) Accuracy test of the EVSE system at a load ~~not greater than~~ between 10 % and 20% of the maximum deliverable amperes ~~(expressed as MDA) as determined from the pilot signal~~ for a total energy delivered of at least the minimum measured quantity (MMQ).

(b) For DC systems (see note):

(1) Accuracy test of the EVSE system at a load of not less than 85 % of the maximum deliverable amperes ~~current (expressed as MDA) as determined from the digital communication message from the DC EVSE to the test standard~~ for a total energy delivered of at least twice the minimum measured quantity (MMQ).

(2) Accuracy test of the EVSE system at a load ~~between not more than~~ between 10 % and 20% of the maximum deliverable amperes ~~(expressed as MDA) as determined from the digital communication message from the DC EVSE to the test standard~~ for a total energy delivered of at least the minimum measured quantity (MMQ).

All DC EVSE are exempt from this requirement until January 1, 2028.

(Amended 2022)

Note: 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 provided that it is greater than 30% of the maximum deliverable amperes of the EVSE system.

Appendix D:

maximum deliverable amperes. - The value in amperes, marked on an EVSE pursuant to paragraph S.5.2. EVSE Identification and Marking Requirements, of the maximum current that the EVSE can provide.

Previous Action:

New item in 2023

Original Justification:

The accuracy tests in section 3.40 contemplate testing an EV charger at two points, one at relatively low current and power, and the other at relatively high current and power. The low point was evidently intended to be at 10% of a charger's maximum current. It is likely that charger manufacturers have designed chargers with that 10% in mind as the "low" point of accuracy tests. But the code does not actually state that testing should be *at* 10%. It says testing can be at a current *less than* 10%. This formulation is problematic because it encompasses any current less than 10%. Zero is less than 10%, and 0.1 A is less than 10% even though it is less than the amount at which the code requires a charger to first register a load.

Even currents larger than these, but less than 10%, would be unnecessarily difficult for an accuracy test. The problem is that low currents are an area where accuracy is particularly difficult. For example, one common metering configuration is to measure the current being delivered by means of a shunt resistor, which generates a voltage from the high current passing through it. These resistors necessarily have very low resistances, because they are necessarily dissipating power in accordance with the resistance. A typical resistor in an EV charger metering setup might be 100 micro-ohms. For a 500 amps full-scale current in a DC charger, that resistor would be dissipating 25 watts of power - thus, a much larger resistor is not a practical option. At, say, 10 amps of delivered current, the voltage generated across the resistor would be 1 millivolt. A 1% measurement of that 1 millivolt would be 10 microvolts. At that level, a range of noise sources become quite significant, such as thermal EMF in the resistor itself and induced EMFs from the presence within the charger cabinet of voltages up to 480 volts ac or 950 volts dc, as well as any offsets or noise in the circuitry measuring the transduced voltage. The net result is that it is very challenging to achieve high accuracy at low currents in a device designed to handle and measure high currents. For reasons like these, the draft international (OIML) standard specifies that an accuracy test should be conducted *at* a given minimum current, rather than (like current Handbook 44) at any current *up to* that minimum.

Meanwhile, low currents are the levels least significant for transactional accuracy. At low current, a charger is delivering energy at a relatively low rate. As a practical matter, an EV will charge at the maximum rate possible in the circumstances. As the battery reaches a higher state of charge, it will draw less power from the EV, but only a small proportion of the overall energy will be delivered at low rates, precisely because the rates are low. Suppose, as a simplified example, an EV charges for 30 minutes at 300 amps and 30 minutes at 15 amps (at a voltage of 400 volts). The EV will have received 60 kWh in the first part of the session, and only 3 kWh in the second part. The low-current period of charging contributes relatively little to the accuracy/inaccuracy of the overall transaction.

Thus, it is important for Handbook 44 to set a minimum current for accuracy tests. Because the point of 10% of the maximum deliverable amperes is already in the code and has probably been used as a design basis for chargers, the proposal would keep that as the low-current point. The overall concept would be for testing to occur *at* 10% of maximum deliverable amperes, rather than *up to* 10%. But it is impractical to specify a single point. An inspection that does not achieve a test at precisely the 10% should not, as a consequence, be an invalid inspection. To make this practical, the proposal would have the low-end test occur in a range of currents, namely 10% to 20% of the charger's maximum.

The code presents a similar problem for DC chargers tested using EVs as loads. The code allows an EV to be used as the load, rather than using a controlled load that draws the loads specified in the code. But the code provides no specifications about how to use an EV in this sort of test. So it is possible that a tester could use an EV that is, say, at 95% state of charge in the battery, and that would arrive at the charger and draw very low levels of current (sometimes called a "trickle charge"). For the reasons discussed above, that sort of test would not be a productive test of the meaningful accuracy of the charger. The code should set a minimum current for an EV-based test to be usable. The proposal would have that minimum be 30% of the charger's maximum. It is set at more than 10% because the EV-based test uses a single test point, which should therefore be somewhere in the middle of the charger's range.

The proposal would also add a definition of "maximum deliverable amperes." This quantity is the same as used in the existing code as the basis for the 10% figure, but it is not currently defined. The definition would state that maximum deliverable amperes means the amount marked on the charger. (The code already requires that amount to be marked.) This amount might be less than the manufacturer's specification for the potential maximum of the device, if for example the installation limits the charger to a particular amount, or the installer has selected a configuration

with a lower maximum. But the maximum deliverable amount is a quantity that is fixed at installation, and marked on the charger. The current code suggests that maximum deliverable amperes is the amount that the charger communicates to a vehicle or test apparatus. That approach is confusingly ambiguous, because the charger might for various reasons sometimes communicate a lower available current than its marked maximum. The proposal clarifies that for accuracy tests based on a percentage of maximum current, the “maximum” being used is the maximum marked on the device.

These concepts have been discussed in the U.S. National Work Group’s subgroup on EV charging. There is general consensus in favor of the proposal, but there has not been a quorum to vote formally in favor of it.

Finally, the proposal would eliminate the no-load and starting-load tests. These tests take unnecessary time, because an inspector has to wait to verify that a load of zero genuinely produces no response and a starting load of just 0.5 amps produces a response. Meanwhile, these tests are not meaningful for the transactional accuracy of an EV charger. In the process of establishing a handshake that the EV charger is connected to a vehicle, the charger might provide minute test amounts of current, so that a truly zero load is not pertinent to any real transaction; and these minute test currents may well be above 0.5 amps, so that this threshold is also not pertinent to transactions. It would be possible to verify that a charger does not register an energy delivery when no transaction is started, but that test would be redundant of verifying that the charger starts at zero. Meanwhile, 0.001 kWh (the minimum resolution under Handbook 44) corresponds to roughly 3 to 5 hundredths of a cent, so that verifying the registration of such tiny amounts given a tiny current is not helpful for the overall transactional accuracy.

The submitter is not aware of objections that would be raised to this proposal. The concept is consistent with the discussions at the U.S. National Work Group based on information from testing over the past six years, and input from regulators and industry.

The submitter requested that this be a Voting item in 2023.

Comments in Favor:

Regulatory:

- None

Industry:

- None

Advisory:

- None

Comments Against:

Regulatory:

- 2023 Interim: Mr. Ed Williams (Ventura County Agricultural Commissioner, CA) commented the language needs clarification on the maximum deliverable amperes and suggested the current language may be restrictive since there is a prescriptive range to test within.

Industry:

- 2023 Interim: Mr. Keith Bradley (Electrify America) commented it is difficult to test EVSE devices at low current and has the least impact to the commercial transaction. Mr. Bradley stated it is more appropriate to have a range and recommends striking language in Pub 15, page S&T-287, lines 6-7. Mr. Bradley added this item is needed to address low limit testing.
- 2023 Annual: Mr. Keith Bradley, Electrify America (submitter)-working on updates.

Advisory:

-

Neutral Comments:

Regulatory:

- 2023 Interim: Mr. Kevin Schnepf (State of California, Division of Measurement Standards) agrees with Ms. Butcher's comments and recommends the submitter work with the NIST USNWG EVFE Subgroup for item development.

Industry:

- None

Advisory:

- Ms. Tina Butcher (NIST OWM) referred to the written comments submitted by NIST OWM. Ms. Butcher added there is more work needed to develop this item and referred to WWMA's recommendation to combine with EVF-23.4 and to work with NIST USNWG EVFE Subgroup for item development.

Item Development:

NCWM 2023 Interim Meeting: The Committee considered the comments heard during open hearings and assigned a Developing status to the item. The Committee recommends the submitter work with the NIST USNWG EVFE Subgroup for item development.

NCWM 2023 Annual Meeting: The Committee heard from Keith Bradley, Electrify America (submitter) that they are working on updates.

Regional Associations' Comments:

CWMA 2023 Interim Meeting: The committee heard comments on this item and item EVF 23.4 concurrently. Comments made about this item will also be found in the comments section on item EVF 23.4.

Theo Brillhart from Fluke presented material regarding the merge of EVF 23.4 and EVF 23.7 by the submitters as well as the passing of item EVF 23.1 at the 2023 Annual NCWM Meeting. The passing of item EVF 23.1 has forced a renumbering of sections within this current proposal. The submitters of EVF 23.4 and EVF 23.7 have reflected those changes in their proposal. With these changes (letter submitted), the submitter recommends this item as voting.

Scheleese Goudy from Electrify America agrees with the proposal because it makes testing easier. Language regarding '10 amps or above' fixes the concerns between item EVF 23.4 and item EVF 23.7.

Perry Lawton from TESCO applauds the work achieved between EVF 23.4 and EVF 23.7.

Steve Peter from Wisconsin supported this item.

The committee recommends this item moving forward as a voting item with the proposed changes by the submitter which are attached to the bottom of this report (same proposal referenced in item EVF 23.4). [APPENDIX C]

WWMA 2023 Annual Meeting: During the WWMA 2023 annual meeting:

The Committee heard comments regarding item EVF-23.4 and this item. The WWMA S&T Committee received a letter with updated proposed language for this item and EVF-23.4. The letter has been posted to the WWMA website, {Events – Meeting Documents – Letter From the Submitters EVF-23.4 and EVF-23.7}. This letter has also been provided to the NCWM S&T Committee.

Comments were heard supporting the proposed language in the Joint Letter dated August 22, 2023.

Mr. Kevin Schnepp (California Division of Measurement Standards): Supported this item with an additional proposed revision of changing the Exemption Date from 2028 to 2025.

The WWMA 2023 S&T Committee recommends this item be assigned a Withdrawn status in favor of item EVF-23.4. Based on comments heard during open hearings from industry, and in consideration of the Letter from the Submitters this committee recommends that EVF-23.4 be updated with the proposed language in the letter and EVF-23.7 be withdrawn.

SWMA 2023 Annual Meeting: The committee recommends incorporating this item into EVF-23.4, and withdrawing this item based upon the proposed joint language provided in a letter dated August 22, 2023 from William Hardy and Keith Bradley the submitters of these two items.

The committee recommends this item be withdrawn.

NEWMA 2023 Interim Meeting: After hearing comments on EVF-23.4 and upon consensus of the body, the Committee recommends this item be Withdrawn.

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

GMA – GRAIN MOISTURE METERS 5.56 (A)

GMA-19.1 D Table T.2.1. Acceptance and Maintenance Tolerances Air Oven Method for All Grains and Oil Seeds.

Source:

NTEP Grain Analyzer Sector

Purpose:

Reduce the tolerances for the air oven reference method.

Item Under Consideration:

Amend Handbook 44, Grain Moisture Meter Code 5.56 (a) as follows:

T.2.1. Air Oven Reference Method. – Maintenance and acceptance tolerances shall be as shown in Table T.2.1. Acceptance and Maintenance Tolerances Air Oven Reference Method. Tolerances are expressed as a fraction of the percent moisture content of the official grain sample, together with a minimum tolerance. (Amended 2001)

Table T.2.1. Acceptance and Maintenance Tolerances Air Oven Reference Method		
Type of Grain, Class, or Seed	Tolerance	Minimum Tolerance
Corn, oats, rice, sorghum, sunflower	0.05 of the percent moisture content	0.8 % in moisture content
All other cereal grains and oil seeds	0.04 of the percent moisture content	0.7 % in moisture content

<u>Table T.2.1.</u> <u>Acceptance and Maintenance Tolerances Air Oven Reference Method</u> <u>for All Grains and Oil Seeds</u>	
<u>Tolerance</u>	<u>Minimum Tolerance</u>
<u>0.03 of the percent moisture content</u>	<u>0.5 % in moisture content</u>

(Amended 2001 **and 20XX**)

Background/Discussion:

This item has been assigned to the submitter for further development. For more information or to provide comment, please contact:

Mr. Karl Cunningham
 Illinois Department of Agriculture
 217-785-8301, karl.cunningham@illinois.gov

Samples and list of grains that AMS, FGIS request from states to include in their ongoing calibration program. States and other interested parties wanted to verify that corn samples from their state were included in the calibration data for NTEP meters because of variations states reported between UGMA meter and other meter technologies on corn samples.

During the 2016 Grain Analyzer Sector Meeting, numerous instances of inconsistent moisture meter measurements involving grain shipments from U.S. interior facilities to U.S. export port facilities were reported. The Sector received a suggestion that if the UGMA can make better measurements, then the Sector should consider reducing the applicable tolerances in HB 44. At the 2016 and 2017 Grain Analyzer Sector meetings Mr. Charlie Hurburgh (Iowa State University) agreed to chair a GA Sector Task Group to review the current HB 44 tolerance with both UGMA meters and Non-UGMA meters. During the 2018 meeting Mr. Hurburgh reported that based on data he analyzed from Iowa State Weights and Measures Grain Inspection reports, UGMA meters read closer to the reference air oven moisture results than non-UGMA meters.

It was also noted during the 2018 NTEP Grain Analyzer Sector meeting that the current tolerances were developed in 1991 and have not been changed to coincide with the change in technology for these devices; and this action is needed for grain industry risk management.

Prior to the 2019 NCWM Interim Meeting, all four regional weights and measures associations agreed to forward the proposal as a voting item on the Interim Agenda. However, following the regional meetings, additional data was submitted to the Sector which indicates a need to consider developing different tolerance for some grain types. Through a subsequent ballot, and a majority vote, the Sector agreed to recommend changing the status of the item to developing to provide the Sector time to consider additional data and changes to its original proposal.

NCWM 2019 Interim Meeting: The NCWM S&T Committee heard comments to agenda item GMA-3. Mr. Loren Minnich (KS) commented that he spoke with Ms. Diane Lee (NIST OWM) and she reported that one state was concerned with the application of the reduced tolerances to all grain types, specifically grains with hulls or husks. Mr. Minnich suggested that this item be assigned a “Developing” status to allow for more research into this issue. The committee also received written comments from NIST, OWM (see NIST, OWM Analysis posted on the NCWM Website). During the 2019 Interim Meeting, the S&T Committee considered the comments during the opening hearing and comments submitted prior to the meeting and assigned a “Developing” status for this item.

1 NCWM 2019 Annual Meeting: Ms. Diane Lee (NIST OWM) provided an update on the history of the item. Ms. Lee
2 noted that the NTEP Grain Analyzer Sector will review data from Arkansas at its 2019 meeting intended to assure that
3 proposed changes to the tolerances can be applied to all grains. Ms. Lee speaking on behalf of the Sector stated that
4 the Developing status assigned to this item is appropriate.

5 NCWM 2020 Interim Meeting: The Committee heard from Ms. Diane Lee (NIST OWM) who stated that when this
6 item was initially submitted the GMM Sector agreed to reduce tolerance based on data that was limited to corn and
7 soybeans. Following the review of the initial data, additional data from Long Grain Rough Rice was reviewed and
8 the sector agreed that additional data was needed on other grains to include oats, rice, and barley, prior to changing
9 the tolerances. Ms. Lee requested that the item remain developing status as additional data is collected.

10 During the Committee's work session, the committee agreed to retain this item as Developing to allow the submitter
11 to continue working with members of the grain analyzer sector to collect additional data.

12 NCWM 2020 Annual Meeting: Due to the 2020 Covid-19 pandemic, this meeting was adjourned to January 2021, at
13 which time it was held as a virtual meeting. Due to constraint of time, only those items designated as 2020 Voting
14 Items were addressed. All other items were addressed in the subsequent 2021 NCWM Interim Meeting.

15 NCWM 2021 Annual Meeting: The Committee heard comments from Ms. Diane Lee (NIST OWM) who noted that
16 additional data is needed to assess the proposed tolerances. Ms. Lee requested that this item remain Developing.
17 During the Committee's work session, the Committee agreed to a Developing status for this item.

18 NCWM 2022 Interim Meeting: The Committee heard comments from Ms. Diane Lee (NIST OWM) who noted that
19 additional data is needed to assess the proposed tolerances. Ms. Lee added that states would be submitting more data.
20 Ms. Lee requested that this item remain Developing. During the Committee's work session, the Committee agreed to
21 a Developing status for this item.

22 NCWM 2022 Annual Meeting: The Committee heard updates from Ms. Tina Butcher, NIST OWM. The original
23 intent of this item was to apply the proposed tolerance to corn and soybeans, however, other grains were identified for
24 areas of study. The Grain Sector was working with States to collect additional data; however, the pandemic has slowed
25 the process. The Grain Sector is requesting additional time to collect this data. The Committee has agreed to maintain
26 a Developing status for this item.

27 NCWM 2023 Interim Meeting: The S&T Committee heard comments from the floor during open hearings. Mrs. Tina
28 Butcher (OWM/NIST) commented that COVID has put a hamper on the collection of data that is needed for the study.
29 Request that the item remain developing. The committee left the item Developing.

30 NCWM 2023 Annual Meeting: The S&T Committee heard comments from NIST that they were still waiting on
31 sample data and that North Carolina had submitted some data for review as stated in the OWM Analysis.

32 **Regional Associations' Comments:**

33 CWMA 2023 Interim Meeting: No comments were heard.
34 The committee recommends this item as developing to allow time to collect additional data.

35 WWMA 2023 Annual Meeting: During the WWMA 2023 annual meeting no comments were received from the body
36 on this item.

37 The WWMA 2023 S&T Committee recommends this item remain a Developing status based on comments heard
38 and included in the 2023 NCWM S&T Committee Annual Report; those comments indicate data is being collected
39 and reviewed.

SWMA 2023 Annual Meeting: Jason Glass, Kentucky, recommended withdrawing the item due to lack of feedback from the submitter.

Aaron Webb, Maryland, stated that the current tolerances were already difficult to achieve, and would not support changing them.

The committee recommends Withdrawal of this item, due to no comments in support, feedback, or development of this item over several years.

NEWMA 2023 Interim Meeting: A regulator from the Commonwealth of Pennsylvania commented that the Task Group was still waiting for additional data to move forward with this item. A regulator from Holliston, Massachusetts recommended this item be withdrawn as it has been on the agenda for four years without data collection being completed, and once it has been collected and analyzed, it can be reintroduced. The States of New Hampshire, Vermont, Connecticut, and the Commonwealths of Pennsylvania and Massachusetts concur. Upon consensus of the body, the Committee recommends this item be Withdrawn.

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

OTH – OTHER ITEMS

OTH-16.1 I Electric Watthour Meters Tentative Code

Source:

NIST, Office of Weights and Measures

Purpose:

- 1) Make the weights and measures community aware of work being done within the NIST U.S. National Work Group (USNWG) on Electric Vehicle Fueling and Submetering to develop proposed requirements for electric watthour meters used in submeter applications in residences and businesses;
- 2) Encourage participation in this work by interested regulatory officials, manufacturers, and users of electric submeters.
- 3) Allow an opportunity for the USNWG to provide regular updates to the S&T Committee and the weights and measures community on the progress of this work;
- 4) Allow the USWNG to vet specific proposals as input is needed.

Item Under Consideration:

Add Non-Utility Electricity-Measuring Systems Code to Handbook 44, as follows:

NIST Handbook 44 Device Code Requirements for

Non-Utility Electricity-Measuring Systems

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27

28 Section 3.XX. Non-Utility Electricity-Measuring Systems – Tentative Code

29 **This tentative code has only a trial or experimental status and is not intended to be enforced. The requirements**
30 **are designed for study prior to the development and adoption of a final code. Officials wanting to conduct an**
31 **official examination of a Non-Utility Electricity-Measuring System (NUEMS) are advised to see paragraph**
32 **G-A.3. Special and Unclassified Equipment.**
33 **(Tentative Code Added 20XX)**

34 **NUEMS Acronym and Definition: As used throughout this code, a Non-Utility Electricity-Measuring System**
35 **or “NUEMS” is defined as an electricity measuring system comprised of all the metrologically relevant**
36 **components required to measure electrical energy, store the result, and report the result used in non-utility**
37 **sales of electricity wherein the sale is based in whole or in part on one or more measured quantities.**

38 **Safety Note: This code does not specifically discuss Safety. It is essential that all personnel working with the**
39 **devices covered by this code and associated electrical equipment be properly trained and adhere to all**
40 **applicable safety standards, regulations, and codes. See also General Code Paragraph G-N.1. Conflict of Laws**
41 **and Regulations.**

A. Application

A.1. General. – This code applies to measuring systems used in non-utility sales of electric energy wherein the sale is based in whole or in part on one or more measured quantities.

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

(a) The use of any measuring system owned, maintained, and/or used by a utility.

(b) Measuring systems used solely for delivering electric energy in connection with operations in which the amount delivered does not affect customer charges or compensation.

(c) Electric vehicle fueling systems. (See 3.40. Electric Vehicle Fueling Systems Code)

(d) Transactions not subject to weights and measures authority.

A.3. Additional Code Requirements. – In addition to the requirements of this code, Non-Utility Electricity-Measuring Systems shall meet the requirements of Section 1.10. General Code.

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.

A.5. NUEMS Type Notation. – Code sections and subsections with an [ES] notation apply to External Sensor NUEMS only. Code sections and subsections with a [IS] notation apply to Internal Sensor NUEMS only. Code sections and subsections without [ES] or [IS] notation apply to both NUEMS types.

S. Specifications

S.1. Indicating and Recording Elements.

S.1.1. Units. – Units for any indicated or recorded measurements shall be as follows:

Active Energy: kilowatt-hours (kWh)

S.1.1.1. Numerical Value of Quantity-Value Divisions. – The value of an increment shall be equal to a decimal multiple or submultiple of 1.

Examples: quantity-value divisions may be 10; or 0.01; or 0.1; etc.

S.1.1.2. Digital Indications. – An indication shall include the display of a number for all places that are displayed to the right of the decimal point and at least one place to the left. Otherwise, leading zeros are not required.

S.1.2. Nominal Capacity. – A device shall have a minimum capacity indication of five digits of resolution.

[Nonretroactive as of January 1, 20XX]

S.1.3. NUEMS Indications.

S.1.3.1. Primary Indicating Element. – Each NUEMS shall be equipped with a primary indicating element that includes a display visible and accessible after installation which clearly indicates the number of kilowatt-hours measured by the NUEMS.

1 S.1.3.2. Test Output. – A NUEMS shall have either: (1) a rotating disk indicator; (2) a pulse output
2 (visible or infrared), or (3) an electrical pulse (in the form of a closure relay or an electronic means),
3 which provides a pulse with K_t or K_h Watt-Hours per pulse. The value of K_t or K_h shall be such that
4 the NUEMS's accuracy can be tested in 5 minutes or less for any specific test.

5 S.1.3.3. Segments. – A segmented digital indicating element shall have an easily accessible provision
6 for checking that all segments are operational.

7 S.1.3.4. Real-time Indicating Element. – If the indicating element is not on continuously, it shall be
8 accumulated continuously so that real-time measurement is indicated during activation.

9 S.1.3.5. Multiple NUEMS, Single Indicating Element. – A primary indicating, or combination
10 indicating-recording element coupled to two or more NUEMS shall be provided with a means to easily,
11 clearly, and definitely display information from a selected NUEMS and shall automatically indicate
12 which NUEMS is associated with the currently displayed information.

13 S.1.3.6. NUEMS With External Sensors Located Remotely from the Test Output. – For NUEMS
14 with external sensors located remotely from the test output which can be installed as described in
15 paragraph UR.2.4.8. External Sensors Located Remotely from the Test Output, means shall be
16 provided to allow the test output to be remotely used.

17 S.1.3.7. NUEMS With a Register Ratio. – For NUEMS with a register ratio, the register ratio shall
18 be indicated on the front of the registers that are not an integral part of the NUEMS nameplate. Means
19 shall be provided for the tenant to read the register.

20 S.2. Design of Measuring Elements and Measuring Systems.

21 S.2.1. Metrological Components. – A NUEMS shall be designed and constructed so that metrological
22 components are adequately protected from environmental conditions likely to be detrimental to accuracy
23 based on the specified installation locations for the NUEMS.

24 S.2.2. Provision for Sealing. – Adequate provision shall be made for an approved means of security
25 (e.g., data change audit trail) or physically applying security seals in such a manner that undetected access
26 to metrologically significant mechanisms and parameters is prevented. Specifically, after sealing no
27 adjustment or change may be made to:

28 (a) any measuring element;

29 (b) any metrological parameter that affects the metrological integrity of the device or system; and

30 (c) any wiring connection which affects the measurement.

31 When applicable, any adjusting mechanism shall be readily accessible for purposes of affixing a security
32 seal. Audit trails shall use the format set forth in Table S.2.3. Categories of Device and Methods of Sealing.

<u>Table S.2.3.</u> <u>Categories of Device and Methods of Sealing</u>	
<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.</u> <u>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.</u>
<u>Category 3: Remote configuration capability access may be unlimited or controlled through a software switch (e.g., password).</u> <u>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.</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 through the device or through another on-site 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.)</u>

S.2.4. NUEMS Watthour Registration Retention. – The NUEMS shall retain the total accumulated watthour registration and shall not be affected by electrical, mechanical or temperature variations, radio-frequency interference, power failure, or any other environmental influences to the extent that accuracy is impaired. This also applies to other billable quantities.

S.3. Markings. – The following identification and marking requirements are in addition to the requirements of Section 1.10 General Code, paragraph G-S.1. Identification.

S.3.1. Location of Marking Information. – The marking information may be placed either internally or externally (as specified in paragraphs S.3.2. Device Identification and Marking Requirements and S.3.3. External Sensor Identification and in the associated tables) provided:

i. the information is permanent and easily read; and accessible for inspection;

1 ii. the information is on a portion of the device that cannot be readily removed or interchanged (e.g.,
2 not on a service access panel). A readily removable cover is an acceptable location for the required
3 information provided: (1) the information is permanently marked elsewhere on the device or is
4 readily accessible through other means such as through an electronic display; or (2) a unique
5 marking on the removable cover can be matched with what is programmed into or permanently
6 marked on the meter, thus linking that marking (and any other markings) included on the cover
7 with that specific device.

8 iii. accessing the information does not require accessing an area with live exposed voltages greater
9 than 40 V.

10 The use of a key or tool to access internal marking information is permitted for retail electricity-measuring
11 devices. Where possible, clear covers should be used to enable viewing of internally marked information.

12 S.3.2. Device Identification and Marking Requirements. – In addition to all the marking
13 requirements of Section 1.10 General Code, paragraph G-S.1. Identification, each device shall have the
14 following information conspicuously, legibly, and indelibly marked on the nameplate or register.

15 S.3.2.1. Device Identification and Marking Requirements of Meter with External Sensors – Sensor
16 input connection with intended polarity shall be physically marked on the meter when direction-
17 sensitive.

18 S.3.2.2. Device Identification and Marking Requirements, Internal Sensor (IS) NUEMS. – The
19 following markings shall be physically marked on an Internal Sensor (IS) NUEMS:

20 (a) AC voltage range or rating in VAC;

21 (b) Watthour constant (K_h) or Watthour test constant (K_t);

22 (c) Register ratio (R_r or K_r) for meters with a rotating disc and multiplier (if greater than one)
23 preceded by “multiply by” or “mult by” or “ K_r ”;

24 (d) Number of wires (W);

25 (e) Form designation (FM) (for A-base and socket NUEMS only); and

26 (f) Current Class (CL).

27 S.3.2.3. Device Identification and Marking Requirements of Meters, External Sensor (ES) NUEMS.
28 – In addition to all the marking requirements of Section 1.10 General Code, paragraph G-S.1.
29 Identification, External Sensor (ES) NUEMS shall have the following legibly, and indelibly marked on
30 the meter as shown in:

31 • Tables S.3.2.3.a. Device Identification and Marking Requirements of Meter – External
32 Sensor (ES) NUEMS; and

33 • Table S.3.2.3.b. Descriptors for Table S.3.2.3.a. Device Identification and Marking
34 Requirements of Meter – External Sensor (ES) NUEMS.

35 (a) service type or service configuration.

Table S.3.2.3.a. Device Identification and Marking Requirements for External Sensor (ES) NUEMS		
	<u>Physical Marking</u>	<u>Electronic Display^{*,**}</u>
<u>Manufacturer or Distributor name, initials, or trademark (1)</u>	<u>R</u>	<u>D</u>
<u>Model Prefix (2)</u>	<u>O</u>	<u>D</u>
<u>Model (3)</u>	<u>R</u>	<u>D</u>
<u>Serial Number Prefix (4)</u>	<u>O</u>	<u>D</u>
<u>Serial Number (5)</u>	<u>R</u>	<u>D</u>
<u>NTEP CC Number with Prefix (6)</u>	<u>R</u>	<u>D</u>
<u>NUEMS Voltage Input Rating (7) Nonretroactive as of January 1, 2024.</u>	<u>O</u>	<u>D</u>
<u>Voltage Sensor Rating (8) Nonretroactive as of January 1, 2024.</u>	<u>O</u>	<u>D</u>
<u>Voltage Sensor Ratio (9) Nonretroactive as of January 1, 2024.</u>	<u>O</u>	<u>D</u>
<u>NUEMS Current Input (10) Nonretroactive as of January 1, 2024.</u>	<u>O</u>	<u>D</u>
<u>Sensor Primary Current Rating (11) Nonretroactive as of January 1, 2024.</u>	<u>O</u>	<u>D</u>
<u>Sensor True Ratio (12) Nonretroactive as of January 1, 2024.</u>	<u>O</u>	<u>D</u>
<u>K_h or K_t (13)</u>	<u>O</u>	<u>D</u>
<u>Bi-directional (14)</u>	<u>O</u>	<u>D</u>
<u>Temperature Range if narrower than -20 °C to + 50 °C (- 4 °F to + 122 °F) (15)</u>	<u>O</u>	<u>D</u>
R Required to be marked on the NUEMS O Required to be marked on the NUEMS only if information is not available on a display D Alternate when information is not marked physically on the NUEMS. If device identification and marking is provided on an electronic display, then all fields must be provided.		

***“Electronic Display” includes, but is not limited to, displays of the required marking information through a NUEMS display, a mobile device, or other electronic means as specified by the manufacturer and retrievable through the NUEMS. This may include providing access directly from the meter to a webpage. If the information is provided via a mechanism other than the NUEMS display, the mechanism must be provided by the device owner/operator as specified in UR.2.4.10. Devices for Viewing Marking Information Provided Via an Electronic Display, External Sensor (ES) NUEMS.**

****Instructions on how to view required markings shall be marked on the device or provided in the NTEP CC.**

General:

- **Numbers appearing in parentheses (e.g., (1)) following each marking requirement above correspond to numbered descriptors in Table S.3.2.2.b. Descriptors for Table S.3.2.3.a. Device Identification and Marking Requirements of External Sensor (ES) NUEMS.**
- **For requirements and details on application, see Table S.3.2.3.b. Descriptors for Device Identification and Marking Requirements of External Sensor (ES) NUEMS.**

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<u>Table S.3.2.3.b.</u> <u>Descriptors for Device Identification and Markings Requirement of External Sensor (ES) NUEMS</u>	
<u>1. Manufacturer’s Identification. Marked per General Code paragraph G-S.1. Identification.</u>	
<u>2. Manufacturer’s Model Prefix. For an External Sensor (ES) NUEMS having its NTEP number clearly identified, conspicuously and indelibly marked on the meter, where the NTEP certificate contains the complete marking details (including a description of the location and purpose of specific markings), the associated NUEMS is not required to meet General Code paragraph G-S.1. Identification (b)(1).</u>	
<u>3. Manufacturer’s Model Identifier. Marked per General Code paragraph G-S.1. Identification.</u>	
<u>4. Serial Number Prefix. For an External Sensor (ES) NUEMS having its NTEP number clearly identified, conspicuously and indelibly marked on the meter, where the NTEP certificate contains the complete marking details (including a description of the location and purpose of specific markings), the associated NUEMS is not required to meet General Code paragraph G-S.1. Identification (c)(1).</u>	
<u>5. Serial Number. Also see General Code paragraph G-S.1. Identification.</u>	
<u>6. NTEP Certificate of Conformance Number and Prefix. NUEMS electronics that has been evaluated by NTEP and has its own NTEP CC shall be marked per General Code paragraph G-S.1. Identification.</u>	
<u>7. NUEMS Voltage Input Rating (V_{nom}). The nominal voltage input(s) for the voltage channel of the NUEMS electronics (e.g., 120VAC, 600VAC, 120-480VAC, etc.). Multiple forms of the term such as “Rated Voltage,” “Max Voltage,” and “Reference Voltage” are permitted.</u> <u>[Nonretroactive as of January 1, 2024]</u>	
<u>8. Voltage Sensor (V_{nom}). The nominal input at the voltage sensor. If a voltage sensor is not used this marking is not required. If a voltage sensor is used, a multiplier can be used in place of V_{nom} and voltage sensor ratio.</u> <u>[Nonretroactive as of January 1, 2024]</u>	
<u>9. Voltage Sensor Ratio. Ratio of sensor primary voltage to sensor output voltage. If a voltage sensor is not used this marking is not required. If a voltage sensor is used, a multiplier can be used in place of V_{nom} and voltage sensor ratio.</u> <u>[Nonretroactive as of January 1, 2024]</u>	

<p>10. NUEMS Current Input (<i>Input I_{nom} or I_{max}</i>). <i>The nominal current or voltage input for the current channel of the NUEMS electronics. The output of the current sensor must match the input configuration of the meter.</i> <i>[Nonretroactive as of January 1, 2024]</i></p>
<p>11. Sensor Primary Current Rating (<i>Sensor I_{nom}</i>). <i>The nominal current input through the sensor.</i> <i>[Nonretroactive as of January 1, 2024]</i></p>
<p>12. True Ratio – True Ratio. <i>The True Ratio, in primary amperes or volts to secondary amperes or volts shall be physically marked on a meter unless it is contained in either electronic or printed documentation. This is to be expressed as xxxA:yyyA; or xxxA:yyyV; or xxxV:yyyV. The number of digits is the number needed to express the values.</i> <i>[Nonretroactive as of January 1, 2024]</i></p> <p>Examples of sensor ratio markings include: <u>200A:5A</u> <u>400A:0.3V</u> <u>480V:120V</u></p>
<p>13. Kh or Kt. Watthour test constant.</p>
<p>14. Bi-Directional. Marking via a “Separate Document” is permissible only if instructions for accessing that information is described in an accompanying NTEP Certificate of Conformance.</p>
<p>15. Temperature Range if Narrower Than -20°C to $+50^{\circ}\text{C}$ (-4°F to $+122^{\circ}\text{F}$): If the device is rated for use over a range that is narrower than and within -20°C to $+50^{\circ}\text{C}$ (-4°F to $+122^{\circ}\text{F}$), this must be physically and/or electronically marked.</p>

S.3.3. Device Identification and Marking Requirements – External Sensors. – In addition to all the marking requirements of Section 1.10 General Code, paragraph G-S.1. Identification, each external sensor that is non-integral with the meter shall have the following conspicuously, legibly, and indelibly marked as shown in Table S.3.3.a. Device Identification and Marking Requirements – External Sensors and in Table S.3.3.b. Descriptors for Table S.3.3.a. Device Identification and Marking Requirements – External Sensors.

Table S.3.3a. Device Identification and Marking Requirements - External Sensors			
	<u>Physical Marking</u> <u>on Sensor</u>	<u>Electronic</u> <u>Display</u>	<u>Separate</u> <u>Document</u> <u>(Hard Copy or</u> <u>Electronic)</u>
<u>Manufacturer name, initials, trademark</u> <u>(1)</u>	<u>R</u>	<u>D</u>	<u>D</u>
<u>Model Prefix (2)</u>	<u>O</u>	<u>D</u>	<u>D</u>
<u>Model (3)</u>	<u>R</u>	<u>D</u>	<u>D</u>
<u>Serial Number Prefix “S/N” (4)</u>	<u>O ±</u>	<u>D ±</u>	<u>D ±</u>
<u>Serial Number (5)</u>	<u>O ±</u>	<u>D ±</u>	<u>D ±</u>
<u>NTEP CC Prefix and Number (6)</u>	<u>O †</u>	<u>D †</u>	<u>D †</u>
<u>True Ratio (7) [Nonretroactive as of</u> <u>January 1, 2024]</u>	<u>O</u>	<u>D</u>	<u>D</u>

<u>Maximum Primary Current (8)</u>	<u>Q</u>	<u>D</u>	<u>D</u>
<u>Rated Frequency (Hz) (9)</u>	<u>Q</u>	<u>D</u>	<u>D</u>
<u>Maximum Safety Voltage Rating (10)</u>	<u>Q</u>	<u>D</u>	<u>D</u>
<u>Polarity (11)</u>	<u>Q</u>	<u>D</u>	<u>D</u>
<u>R</u> Required to be marked on the device <u>O</u> Required to be marked on the device if information is not available on a display or in printed form <u>D</u> Required when data is displayed on an electronic display or printed document <u>‡</u> Required only when a specific sensor must be matched to a specific meter input to meet accuracy specifications <u>†</u> Required only when a sensor has separate approval from the metering system as a whole.			
<u>Notes:</u> <ul style="list-style-type: none"> Numbers appearing in parentheses (e.g., (1)) following each marking requirement above correspond to numbered descriptors in Table S.3.3.b. Descriptors for External Sensor Marking Requirements. For requirements and details on application, see Table S.3.3.b. Descriptors for External Sensor Marking Requirements. “Electronic” includes, but is not limited to, displays of the required marking information through a NUEMS display, a mobile device, or other electronic means as specified by the manufacturer. 			
<u>Summary:</u> When a NUEMS system is approved as a system, then the only hard marking required on sensors is the Manufacturer’s name and the Model Number, unless pairing a specific sensor to a specific NUEMS input is required, then the serial number is required.			

1

<u>Table S.3.3.b.</u> <u>Descriptors for Device Identification and Marking Requirements - External Sensors</u>	
1.	<u>Manufacturer’s Identification. Marked per General Code paragraph G-S.1. Identification.</u>
2.	<u>Manufacturer’s Model Prefix. The General Code paragraph G-S.1. Identification (b)(1) model prefix marking requirement for the sensor(s) may be met with a physical marking. Alternatively, the marking requirement may be satisfied through an electronic display or in a separate document accompanying the NUEMS provided that the NUEMS has its NTEP number clearly identified, conspicuously and indelibly marked on the meter, where the NTEP certificate contains the complete marking details (including a description of the location and purpose of specific markings).</u>
3.	<u>Manufacturer’s Model. Marked per General Code paragraph G-S.1. Identification.</u>
4.	<u>Serial Number Prefix. For a NUEMS having its NTEP number clearly identified, conspicuously and indelibly marked on the sensor(s), where the NTEP certificate contains the complete marking details (including a description of the location and purpose of specific markings), the associated sensor is not required to meet General Code paragraph G-S.1. Identification (c)(1).</u>
5.	<u>Serial Number. Also see General Code paragraph G-S.1. Identification.</u>

6.	<u>NTEP Certificate of Conformance Prefix and Number.</u> A current sensor that has been evaluated separately by NTEP and has its own NTEP CC shall be marked per General Code paragraph G-S.1. Identification.
7.	<u>True Ratio.</u> <i>The True Ratio, in primary amperes or volts to secondary amperes or volts shall be physically marked on a sensor unless it is contained in either electronic or printed documentation. This is to be expressed as xxxA:yyyA; or xxxA:yyyV; or xxxV:yyyV. The number of digits is the number needed to express the values.</i> <i>[Nonretroactive as of January 1, 2024]</i> <u>Examples of sensor ratio markings include:</u> <u>200A:5A</u> <u>400A:0.3V</u> <u>480V:120V</u>
8.	<u>Maximum Primary Current.</u> The maximum primary current at which the sensor can be safely and accurately operated.
9.	<u>Rated Frequency.</u> A sensor shall be marked with its rated frequency if other than 40Hz to 400Hz.
10.	<u>Maximum Safe Operating Voltage.</u> A sensor shall be marked with a Maximum Safe Operating Voltage if it is less than 600VAC. <u>Examples of sensor maximum safe operating voltage ratings:</u> <ul style="list-style-type: none">• <u>250 Vac</u>• <u>250 VAC</u>• <u>50 V</u> <u>Note:</u> The maximum safe operating voltage rating marking may not be higher than the voltage to which the device was verified during type evaluation.
11.	<u>Polarity Marking.</u> The sensor shall be marked to indicate proper orientation when the accuracy of the NUEMS is affected by orientation.

S.3.4. Abbreviations and Symbols. – When using abbreviations or symbols on a meter , sensor, or indicator, the following shall be used.

- (a) **FM = Form**
- (b) **CL = Class**
- (c) **V = Volts**
- (d) **Hz = Hertz, Frequency or Cycles Per Second**
- (e) **TA = Test Amperes**
- (f) **Kh = Watthour Constant; Revolution or Pulse**
- (g) **Rr = Register Ratio**
- (h) **CSR = Current Sensor Ratio (may also be referred to as “current transformer ratio” or “CTR”)**
- (i) **VTR or PTR = Voltage or Potential Transformer Ratio**
- (j) **MULT BY = Multiply By**
- (k) **W = wire (example: 240V 3W)**

(l) Y = WYE Power Supply

(m) IEEE = Institute of Electrical and Electronics Engineers

(n) B = Burden

(o) BIL = Basic Lightning Impulse Insulation Factor

(p) Kt = Watthour Test Constant

(q) AC = Alternating Current (i.e., VAC)

(r) J = Joule

(s) Wh = Watthour

(t) kWh = Kilowatt-hour

(u) Δ = Delta Power Supply

(v) SD = Soft Data

(w) PD = Printable Data

N. Notes

N.1. NUEMS No-Load Test. – A NUEMS no-load test shall be conducted by applying rated voltage to the NUEMS under test and no current load applied. This test shall be conducted during type evaluation and may be conducted during field testing as deemed necessary. The test duration shall be ten minutes.

N.2. NUEMS Starting Load Test. – A NUEMS starting load test shall be conducted by applying rated voltage at a load of 0.25% of the Current Class (CL) or the Sensor Primary Current Rating at unity power factor. The rated voltage. The test shall be conducted during type evaluation and may be conducted during field testing as deemed necessary.

N.3. NUEMS Minimum Test Duration. – A NUEMS full load test shall consist of a minimum of 10 watthour test constants and a light load test shall consist of a minimum of one watthour test constant.

N.4. NUEMS Test Loads.

(a) Internal Sensor (IS) NUEMS shall be balanced-load tested, and may be single-element tested, for NUEMS accuracy at full and light loads.

(b) External Sensor (ES) NUEMS shall be single-element tested for system accuracy at full and light loads. NUEMS testing shall be accomplished by applying the test load to the sensor(s) with the voltage circuits energized. When it is not feasible to test the system by injecting a primary current, testing using customer load shall be sufficient for field verification.

(c) The reference voltage phases (A, B, or C) at the NUEMS shall be the same phase as the load.

N.5. Test of a NUEMS.

(a) Each NUEMS submitted for test shall have the necessary components required to test such as meter, sensor(s), indicators(s), system software, etc. Testing may be performed in the field.

(b) The test load applied for a full load test shall be 15 % of either the Current Class (CL) or the Sensor Primary Current Rating.

(c) The test load applied for a light load test shall be conducted at 1.5 % to 3 % of either the Current Class (CL) or the Sensor Primary Current Rating.

(d) The test load applied for a full load test of a NUEMS for a 0.5 power factor lagging setting shall be 15 % of either the Current Class (CL) or the Sensor Primary Current Rating. This test shall be conducted during type evaluation and may be conducted during in-service (field) or laboratory testing as deemed necessary.

(e) The test load applied for a light load test for a 0.5 power factor lagging setting shall be conducted at 3 % to 6 % of either the Class (CL) or the Sensor Primary Current Rating. This test shall be conducted during type evaluation and may be conducted during in-service (field) or laboratory testing as deemed necessary.

(f) All tests shall be made at the rated voltage ± 10 %.

N.6. Repeatability Tests. – When conducted, 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.

T. Tolerances

T.1. Tolerances, General.

(a) The tolerances apply equally to errors of underregistration and errors of overregistration.

(b) The tolerances apply to all electric energy measured at any load within the rated measuring range of the device.

(c) Where sensors or other components are used, the provisions of this section shall apply to the entire NUEMS.

T.2. No-Load Test. – A NUEMS shall not emit more than one test pulse output.

T.3. NUEMS Starting Load Test. – The watt-hour test constant (Kt or Kh) output indications or register indication shall continue to advance. The purpose of this section is to verify that the NUEMS accumulates energy at the starting load.

T.4. Load Test Tolerances. – Tolerances for NUEMS shall be as shown in Table T.4. Tolerances for NUEMS. When it is not feasible to test the system by injecting a primary current, tolerances specified under “Tests Conducted at 0.5 Lagging Power Factor” shall apply.

<u>Table T.4.</u> <u>Tolerances for NUEMS</u>		
	<u>Tests Conducted at Unity Power Factor</u>	<u>Tests Conducted at 0.5 Lagging Power Factor</u>
<u>Acceptance Tolerances</u>	<u>1.0 %</u>	<u>2.0 %</u>
<u>Maintenance Tolerance</u>	<u>2.0 %</u>	<u>3.0 %</u>

T.5. Repeatability. – When multiple load tests are conducted at the same load condition, the range of the load test results shall not exceed 25 % of the absolute value of the maintenance tolerance and the results of each test shall be within the applicable tolerance.

UR. User Requirements

UR.1. Selection Requirements.

UR.1.1. Customer Indicating Element, Accessibility. – For systems in which the primary indicating element is not reasonably accessible to the customer, such as one of the following shall be provided.

(a) Console display which is accessible to the customer on which the customer can unambiguously select the NUEMS output associated with this load.

(b) Remote display which is provided to customer as a part of the system.

(c) At the option of the customer, through an application that provides readings in real time.

UR.1.2. Submeter Required. – When a tenant is not directly served by the serving utility, and charges for electric energy are not included in the fixed periodic rent charges, a dedicated NUEMS that measures only the energy used at the discretion of the tenant shall be used.

UR.1.3. Suitability of Equipment. – A NUEMS shall be suitable for use on its electrical system.

UR.1.3.1. Service Applications. – A NUEMS shall accurately measure all loads 5 percent or greater of the electric service capacity of the tenant. Service capacity shall be determined by the master thermal overload protectors to the tenants' service or by the rated capacity of the wiring and its circuits used to provide power from the service panel to the tenant.

$$Annual\ Max = \sum_{phases} [(Phase\ Voltage * Current\ Class)/1000] * HoursPerYear$$

UR.1.3.2. Maximum Quantity-Value Division. – The maximum quantity-value division shall not exceed the minimum increment to be used in billing.

UR.1.4. Current Sensor. – The current sensor output shall be correctly matched to the meter current input.

UR.2. Installation Requirements.

UR.2.1. Manufacturer's Instructions. – A device shall be installed in accordance with the manufacturer's instructions, and the installation shall be sufficiently secure and rigid to maintain this condition.

UR.2.2. Load Range. – A device shall be installed so that the current and voltage will not exceed the maximum continuous ratings of the NUEMS. Means to limit current and/or voltage shall be incorporated in the installation if necessary.

UR.2.3. Regulation Conflicts and Permit Compliance. – If any provision of this section (UR.2. Installation Requirements) is less stringent than that required of a similar installation by the National Electrical Code®, as amended and adopted by the Local Authority having Jurisdiction, the installation shall be in accordance with the National Electric Code.

The installer of any new NUEMS service shall obtain all necessary permits and shall conform to all applicable regulations.

UR.2.4. NUEMS Installation Requirements.

UR.2.4.1. Certification. – It is the responsibility of the owner of a NUEMS to obtain written certification for each device from the appropriate regulatory agency.

The required certification shall meet the requirements of that agency and should identify the address, space, or number, of the premise served by the NUEMS connection; be signed by an agency representative; and shall clearly state the:

- installation is on a tariff schedule that qualifies for NUEMS use,
- billing format, rates, and charges conform to all applicable tariff rules,
- date of such determination, and
- designee's name and title if performed by a designee, and

The certification shall be provided prior to a NUEMS being used for commercial purposes.

UR.2.4.2. NUEMS Test Features. – All NUEMS shall be provided with test features to facilitate common tests methods used in the electrical submetering industry.

UR.2.4.3. Safety Mechanism. – NUEMS installations that are equipped with current transformers with a current output that is not self-limiting shall have a mechanism installed to allow the meter to be connected to or removed for safe testing without the risk of dangerous voltages that can result from secondary open circuit CTs.

UR.2.4.4. Metered Circuits (Submeter Load Service). – For NUEMS with separate line and load service connections, all electricity used by a tenant shall be taken exclusively from the load service of the tenant's NUEMS. This service and its associated NUEMS shall accurately measure the tenant's load and be capable of being used only at the discretion of the tenant.

UR.2.4.5. Dedicated Tenant NUEMS Service. – A NUEMS shall serve only the space, lot, building, room, suite, stall, slip, or premise occupied by the tenant.

UR.2.4.6. NUEMS Tenant Premise Identification. – Tenant premise identification shall be clearly and permanently shown on or at the NUEMS, and on all separate components of a NUEMS, including, but not limited to, current sensor(s), modem(s), and transmitter(s) if equipped. Remote indications and all printed indications shall be readily identifiable and readily associated with the tenant's premise. Printed indications shall also include time and date information. For field configured systems the information shall be after actual configuration is established.

UR.2.4.7. Devices for Viewing Marking Information Provided Via an Electronic Display, External Sensor (ES) NUEMS. – When required markings are provided via an electronic display the owner/operator of the NUEMS is responsible for providing means for viewing this information on the site at the time of inspection or on request. See also Table S.3.2.3.a. Device Identification and Marking Requirements for External Sensor (ES) NUEMS.

UR.2.4.8. External Sensors Located Remotely From the Pulse Output or Display. – If the NUEMS is installed in such a way that testing cannot be conducted by a single inspector from a reasonable testing position, then means shall be provided to allow the pulse output or display to be remotely used at the sensor location. For example, a portable device that receives the pulse by radio/WiFi and provides the pulse as a dry contact closure to the test equipment.

UR.3. Use of Device.

UR.3.1. Recorded Representations. – A record, either printed or electronic, providing the following information on electrical energy usage shall be available at the end of the billable interval:

(a) the total quantity of the energy delivered with unit of measure;

(b) the total computed price of the energy sale;

(c) the unit price of the energy.

For systems capable of applying multiple unit prices for energy during the billable interval, the following additional information is required:

(1) A schedule of the rate time periods and the unit price applied for each

(2) the total quantity of energy delivered during each;

(3) the total purchase price for the quantity of energy delivered during each rate time period.

Appendix D. Definitions

The following definitions are proposed for addition to NIST Handbook 44 Appendix D, Definitions at the time when the status of this Tentative Code is changed from “tentative” to “permanent.” Until such time that the status of the code is designated as “permanent,” these proposed definitions will remain in this section of the Tentative Code.

The specific code to which the definition applies is shown in [brackets] at the end of the definition. Definitions for the General Code [1.10] apply to all codes in Handbook 44.

A

active energy. – The integral of active power with respect to time. Typically measured in units of kilowatt-hours (kWh), or watt-hours.

$$E(T) = \int_0^T v(t) \cdot i(t) \cdot dt \quad \text{Eq. 1}$$

Where T is much greater than the period of the AC line frequency.

alternating current (AC). – An electric current that reverses direction in a circuit at regular intervals. [3.XX]

ampere. – The practical unit of electric current. It is the quantity of current caused to flow by a potential difference of one volt through a resistance of one ohm. One ampere is equal to the flow of one coulomb of charge per second. One coulomb is the unit of electric charge equal in magnitude to the charge of 6.24×10^{18} electrons. [3.XX]

audit trail. – An electronic count and/or information record of the changes to the values of the calibration or configuration parameters of a device. [1.10, 2.20, 2.21, 2.24, 3.30, 3.37, 3.39, 3.XX, 5.56(a)]
(Added 1993)

B

balanced load. – **Balanced load is used to indicate equal currents in all phases and relatively equal voltages between phases and between each phase and neutral (if one exists); with approximately equal watts in each phase of the load. [3.XX]**

basic lightning impulse insulation level (BIL). – **A specific insulation level expressed in kilovolts of the crest value of a standard lightning impulse. (Example: BIL = 10 Kv) [3.XX]**

bidirectional. – **A NUEMS equipped to register the accumulation of energy in both directions (i.e., for delivered and received energy:**

A bidirectional NUEMS shall fall into at least one of the following categories:

(a) **Single register or net meter that displays the difference between the delivered and received energy;**

or

(b) **Separate register(s) for delivered or received. [3.XX]**

burden (B). – **The impedance of the circuit connected to the instrument transformer's secondary winding. (Example: B = 21 Ohms Max) [3.XX]**

C

calibration parameter. – **Any adjustable parameter that can affect measurement or performance accuracy and, due to its nature, needs to be updated on an ongoing basis to maintain device accuracy, e.g., span adjustments, linearization factors, and coarse zero adjustments. [2.20, 2.21, 2.24, 3.30, 3.37, 3.39, 3.XX, 5.56(a)]**
(Added 1993)

configuration parameter. – **Any adjustable or selectable parameter for a device feature that can affect the accuracy of a transaction or can significantly increase the potential for fraudulent use of the device and, due to its nature, needs to be updated only during device installation or upon replacement of a component, e.g., division value (increment), sensor range, and units of measurement. [2.20, 2.21, 2.24, 3.30, 3.37, 3.XX, 5.56(a)]**
(Added 1993)

current. – **The rate of the flow of electrical charge past any one point in a circuit. The unit of measurement is amperes or coulombs per second. [3.XX]**

current class (CL). – **For self-contained meters, the manufacturer's designated maximum rated current a NUEMS can measure continuously without damage and without exceeding limits of accuracy. (Example: CL 200) [3.XX]**

current sensor. – **A device able to measure and output analog or digital representations of one or more currents. Examples of current sensors are current transformers, low-voltage current transducers, and Rogowski coils. (OWM is seeking written permission from National Electrical Manufacturers Association (NEMA) to reprint. Oral permission was received.)**

E

element. – **A combination of a voltage-sensing unit and a current-sensing unit, which provides an output proportional to the quantities measured. Meters can include multiple elements based on service type. For mechanical meters, this is also referred to as a “stator.” (OWM is seeking written permission from National Electrical Manufacturers Association (NEMA) to reprint. Oral permission was received.) [3.XX]**

energy flow. – The flow of energy between line and load terminals (conductors) of a NUEMS. Flow from the line to the load terminals is considered energy delivered. Energy flowing in the opposite direction (i.e., from the load to line terminals) is considered as energy received. [3.XX]

equipment, commercial. – Weights, measures, and weighing and measuring devices, instruments, elements, and systems or portion thereof, used or employed in establishing the measurement or in computing any basic charge or payment for services rendered on the basis of weight or measure. As used in this definition, measurement includes the determination of size, quantity, value, extent, area, composition (limited to meat and poultry), constituent value (for grain), or measurement of quantities, things, produce, or articles for distribution or consumption, purchased, offered, or submitted for sale, hire, or award. [1.10, 2.20, 2.21, 2.22, 2.24, 3.30, 3.31, 3.32, 3.33, 3.34, 3.35, 3.38, 3.XX, 4.40, 5.51, 5.56.(a), 5.56.(b), 5.57, 5.58, 5.59]
(Added 2008)

external sensor. – Any voltage sensor or current sensor not located inside of the meter body NUEMS itself and not inside the sealed enclosure containing the NUEMS. [3.XX]

event counter. – A nonresettable counter that increments once each time the mode that permits changes to sealable parameters is entered and one or more changes are made to sealable calibration or configuration parameters of a device. [2.20, 2.21, 3.30, 3.37, 3.39, 3.XX, 5.54, 5.56(a), 5.56(b), 5.57]
(Added 1993)

event logger. – A form of audit trail containing a series of records where each record contains the number from the event counter corresponding to the change to a sealable parameter, the identification of the parameter that was changed, the time and date when the parameter was changed, and the new value of the parameter. [2.20, 2.21, 3.30, 3.37, 3.39, 3.XX, 5.54, 5.56(a), 5.56(b), 5.57]
(Added 1993)

F

form designation (FM). – An alphanumeric designation denoting the circuit arrangement for which the NUEMS is applicable and its specific terminal arrangement. The same designation is applicable to equivalent NUEMS for all manufacturers. (Example: FM 2S) [3.XX]

H

hertz (Hz). – Frequency or cycles per second. One cycle of an alternating current or voltage is one complete set of positive and negative values of the current or voltage. [3.XX]

I

internal sensor. – Any voltage sensor or current sensor located inside of the meter body NUEMS itself or inside the sealed enclosure containing the NUEMS. [3.XX]

K

kilowatt (kW). – A unit of power equal to 1,000 watts. [3.XX]

kilowatt-hour (kWh). – A unit of energy equal to 1,000 watthours. [3.XX]

L

line service. – The service terminals or conductors connecting the (NUEMS) to the power source. [3.XX]

load service. – The service terminals or conductors connecting the (NUEMS) to the electrical load (e.g., vehicle, tenant, etc.). [3.XX]

load, full. – A test condition with rated voltage, current at 100% of test amps level, and power factor of 1.0. [3.XX]

load, light. – A test condition with rated voltage, current at 10% of test amps level, and power factor of 1.0. [3.XX].

M

master meter, electric. – A (NUEMS) owned, maintained, and used for commercial billing purposes by the serving utility. All the electric energy served to a submetered service system is recorded by the master meter. [3.XX]

metrological components. – Elements or features of a measurement device or system that perform the measurement process or that may affect the final quantity determination or resulting price determinations. This includes accessories that can affect the validity of transactions based upon the measurement process. The measurement process includes determination of quantities; the transmission, processing, storage, or other corrections or adjustments of measurement data or values; and the indication or recording of measurement values or other derived values such as price or worth or charges. [3.XX]

N

non-integral. – Used to describe external sensors that can be disconnected from the meter body. [3.XX]

non-utility electricity measuring system (NUEMS). – An electricity measuring system comprised of all the metrologically relevant components required to measure electrical energy, store the result, and report the result used in non-utility sales of electricity wherein the sale is based in whole or in part on one or more measured.

O

ohm. – The practical unit of electric resistance that allows one ampere of current to flow when the impressed potential is one volt. [3.XX]

P

percent error. – Percent error is calculated as follows:

percent error = (NUEMS reading – standard reading)/standard reading x 100 [3.XX]

power factor (PF). – The ratio of “active power” to “apparent power” in an AC circuit. It describes the efficient use of available power. [3.XX]

primary indicating or recording elements. – The term “primary” is applied to those principal indicating (visual) elements and recording elements that are designed to, or may, be used by the operator in the normal commercial use of a device. The term “primary” is applied to any element or elements that may be the determining factor in arriving at the sale representation when the device is used commercially. (Examples

of primary elements are the visual indicators for meters or scales not equipped with ticket printers or other recording elements and both the visual indicators and the ticket printers or other recording elements for meters or scales so equipped.) The term “primary” is not applied to such auxiliary elements as, for example, the totalizing register or predetermined-stop mechanism on a meter or the means for producing a running record of successive weighing operations, these elements being supplementary to those that are the determining factors in sales representations of individual deliveries or weights. (See “indicating element” and “recording element.”) [1.10, 3.XX]

R

reactive power. – For sinusoidal quantities in a two-wire circuit, reactive power is the product of the voltage, the current, and the sine of the phase angle between them, using the current as the reference. [3.XX]

register ratio (R_r). – The number of revolutions of the gear meshing with the worm or pinion on the rotor shaft per complete rotation of the fastest (most sensitive) wheel or dial pointer. [3.XX]

remote configuration capability. – The ability to adjust a weighing or measuring device or change its sealable parameters from or through some other device that is not itself necessary to the operation of the weighing or measuring device or is not a permanent part of that device.[2.20, 2.21, 2.24, 3.30, 3.37, 3.39, 3.XX, 5.56(a)]
(Added 1993)

retail device. – A measuring device primarily used to measure product for the purpose of sale to the end user. [3.30, 3.32, 3.37, 3.39, 3.XX]

(Amended 1987 and 2004)

S

sensor ratio. – The stated ratio of the primary circuit current or voltage compared to the secondary circuit current or voltage. (example: CSR = 200 : 0.1) [3.XX]

serving utility. – The utility distribution company that owns the master meter and sells electric energy to the owner of a submeter system. [3.XX]

starting load. – The minimum load above which the device will indicate energy flow continuously. [3.XX]

submeter. – A meter or meter system downstream of the electric master meter. [3.XX]

T

tenant. – The person or persons served electric energy from a non-utility electricity-measuring system (NUEMS). [3.XX]

test amperes (TA). – The full load current (amperage) specified by the device manufacturer for testing and calibration adjustment. (Example: TA 30). [3.XX]

thermal overload protector. – A circuit breaker or fuse that automatically limits the maximum current in a circuit. [3.XX]

U

unit price. – The price at which the product is being sold and expressed in whole units of measurement. [1.10, 3.30, 3.XX]

(Added 1992)

utility. – A corporation, person, agency, authority, or other legal entity or instrumentality aligned with distribution facilities for delivery of electric energy for use primarily by the public. Included are investor-owned electric utilities, municipal and State utilities, Federal electric utilities, and rural electric cooperatives. A few entities that are tariff based and corporately aligned with companies that own distribution facilities are also included.

A list of recognized utilities in the U.S. can be found at the U.S. Energy Information Administration (EIA) at: <https://www.eia.gov/electricity/data/eia861> [3.XX]

V

volt. – The practical unit of electromotive force. One volt will cause one ampere to flow when impressed across a resistance of one ohm. [3.XX]

W

watt. – The practical unit of electric power. In an alternating-current circuit (AC), the power in watts is volts times amperes multiplied by the circuit power factor. [3.XX]

watthour (Wh). – The practical unit of electric energy, which is expended in one hour when the average power consumed during the hour is one watt. [3.XX]

meter – self-contained. – A meter in which the terminals are arranged for connection to the circuit being measured without using external instrument transformers. [3.XX]

watthour constant (K_h). – The expression of the relationship between the energy applied to the meter and the output indication, expressed as “watthours per revolution” or “watthours per output indication.” [3.XX]

watthour test constant (K_t). – The expression of the relationship between the energy applied to the meter and the output indication, expressed as “watthours per output indication,” when the meter is in test mode [3.XX]

Background/Discussion:

This item has been assigned to the submitter for further development. For more information or to provide comment, please contact:

Electric Vehicle Refueling Subgroup:

Ms. Juana Williams, Technical Advisor
NIST Office of Weights and Measures
301-975-2196, juana.williams@nist.gov

Electric Watthour Meters Subgroup:

Ms. Lisa Warfield, Chair
NIST Office of Weights and Measures
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This item was submitted as a Developing item to provide a venue to allow the USNWG to update the weights and measures community on continued work to develop test procedures and test equipment standards within its Electric Vehicle Refueling Subgroup. This item will also serve as a forum in which to report work on the development of a proposed tentative code for electric watthour meters in residential and business locations by the USNWG’s Electric Watthour Meters Subgroup and a placeholder for its eventual submission for consideration by NCWM.

Ms. Tina Butcher (NIST OWM), Chairman of the USNWG on Electric Refueling & Submetering has continued to provide regular updates to the Committee on this work. See the Committee’s 2016 through 2018 Final Reports for details.

NCWM 2018 Interim Meeting: No comments were heard on this item and the Committee agreed to maintain its “Developing” status. The Committee did not take comments during open hearings on Developing items at the 2018 NCWM Annual Meeting and agreed to allow only the submitter of a Developing item (or block of Developing items) to provide an update on the progress made to further develop the item(s) since the 2018 NCWM Interim Meeting. The Committee received an update on this item from Ms. Tina Butcher (NIST OWM), Chair of the USNWG on Electric Refueling & Submetering. See the Committee’s 2018 Final Report for Details.

OWM personnel were unable to attend the 2019 NCWM Interim Meeting due to the Federal Government shutdown in early 2019 due to a lack of appropriations; however, OWM provided written comments to the Committee on this item in the advance of the meeting, including the following update on this item:

- The Electric Watthour Meter Subgroup (EWH SG) of the USNWG on Electric Vehicle Fueling & Submetering has held multiple in-person and web meetings since the 2017 NCWM Annual Meeting.
- The SG met in September 2017, November 2017, May 2018, and August 2018. All meetings included web-conferencing to allow those not able to attend in person to participate.
- The SG developed a proposed addition to NIST Handbook 130’s Uniform Regulation for the Method of Sale (MOS) of Commodities (see Item MOS-8 on the L&R Committee’s Agenda) to specify a method of sale for electrical energy sold through these systems and submitted the proposal to the four regional weights and measures association meetings in Fall 2018.
 - Three of the four regions recommend the MOS proposal on the L&R Agenda as a voting item, with the fourth abstaining due to lack of experience with these systems within the region.
- The SG continues work on a proposed code for EWH-type meters for NIST Handbook 44 and expects to have a draft ready for the 2020 NCWM cycle.
- OWM requests this item be maintained on the S&T Committee’s agenda as a Developing Item while the SG finalizes its proposed HB 44 draft. OWM will continue to apprise the Committee of progress.
- At their Fall 2018 meetings, all four regional associations indicated support for maintaining this as a Developing item on the Committee’s agenda.
- The SG will hold its next in-person meeting in February 2019 in Sacramento, CA. *(Technical Advisor’s Note: This meeting was rescheduled to April 2019.)*
- Those interested in participating in this work are asked to contact SG Chair, Ms. Lisa Warfield, or Technical Advisor, Ms. Tina Butcher.

NCWM 2019 Interim Meeting: The Committee heard no comments on this item. At its work session, Committee members agreed with the submitter and the Regional Associations that this item should be assigned a Developing status.

NCWM 2019 Annual Meeting: Ms. Tina Butcher (NIST OWM) provided the Committee with an update on the further development of this item. Ms. Butcher reported that the EWH SG will meet next in August 2019 to continue its work and requested this item remain on the S&T Committee agenda as a Developing item. During the committee’s work session, the Committee agreed with the submitter to retain this item in a Developing status.

NCWM 2020 Interim Meeting: The Committee heard from Ms. Butcher who provided an update on developments in the Electric Watthour Meters Code which is also included in the NIST OWM analysis. Ms. Butcher requested that this item be given a developing status.

During the Committee work session, the committee agreed that this item should be given a Developing status.

NCWM 2020 Annual Meeting: Due to the 2020 Covid-19 pandemic, this meeting was adjourned to January 2021, at which time it was held as a virtual meeting. Due to constraint of time, only those items designated as 2020 Voting Items were addressed. All other items were addressed in the subsequent 2021 NCWM Interim Meeting.

NCWM 2021 Interim Meeting: The Committee heard from Ms. Tina Butcher who provided an update on the developments in the Electric Watthour Code which is include in the NIST OWM analysis and Ms. Butcher requested that this item be given a developing status. The Committee agreed that the item be given a Developing status.

NCWM 2021 Annual Meeting: Ms. Tina Butcher (NIST OWM) provided an update on the developments in the Electric Watthour Code which is included in the NIST OWM analysis. Ms. Butcher noted that the Electric Watthour Code is in Development and anticipates a Code by Fall 2021. There was discussion on definitions for electric master meters and possibly separating the definitions for gas and water master meters and Ms. Butcher requested that this item be given a developing status. The Committee agreed that the item be given a Developing status.

NCWM 2022 Interim Meeting: Matt Douglas (California – DMS) stated that California supports the development of this item but has concerns about identity marking requirements being on a separate document. Also that the devices should be easy to test before and after installation. This device should allow for electronic data logger. Juana Williams (NIST) commented that the subgroup had provided a draft code that is on the website. Ms. Williams requested comments be submitted to Tina Butcher (NIST) or Lisa Warfield (NIST) by March 22, 2022. Ms. Williams stated these comments will be used to provide and updated draft for the 2022-2023 submission cycle and the item remain in developing status. The Committee agreed that the item be given a Developing status.

As discussed at the weighing sector meeting, multiple vehicle types are tested during the NTEP publication 14 test. If a specific vehicle type is failed or not tested, there needs to be a restriction on the vehicle types passed on the certificate. This restriction must also be marked on the device.

NCWM 2023 Interim Meeting: Ms. Tina Butcher (NIST) commented that the USNWG on Electric Watthour Meters Subgroup believes that the draft code is ready for consideration as a voting item. Ms. Butcher asked for continued feedback from the weights and measures community. During the committee work session, the committee agreed that the item is fully developed and has merit, and assigned the item a voting status.

NCWM 2023 Annual Meeting: Henry Alton (METERGY) spoke as a member of industry and a member of the workgroup. He stated the item is ready for a vote and it has been worked on by the members of the workgroup, including regulators. The commentator referred to a letter of support submitted to the committee which was posted on NCWM website.

Andrew Kimura (Santa Cruz County, CA) requested the de-escalation of the item from voting to developing. The commentator noted the regulators on the work group were not in agreeance with the final draft of the agenda item. He provided feedback on specific areas and presented a PowerPoint during open hearing. Mr. Kimura stated the final draft of the agenda item does not address concerns by regulators. The commentator requested the work group consult with regulators to address specific concerns as presented during open hearings and in a letter submitted by the California Agricultural Commissioner and Sealers Association (CACASA). He commented there is no intent to delay the item any further, but expressed the need to develop the item further to address regulators concerns.

Mattew Douglas (Division of Measurement Standards, CA) referenced the letter submitted by California Agricultural Commissioner and Sealers Association (CACASA) and requested de-escalation of the item from voting to developing. He requested the work group work with regulators for further development.

Jose Arriaga (Orange County, CA) requested the de-escalation of the item from voting to developing. He requested the work group work closely with regulators for further development.

Austin Shepard (San Diego County, CA) requested de-escalation of the item from voting to developing. He requested the work group work with regulators for further development.

The committee agreed with many of the comments heard during open hearings and decided to downgrade the item to Informational prior to the voting session. The committee was notified the task group was no longer working on this specific item as it has considered it fully developed. The committee believes the Informational status will allow for further development of the item through the S&T Committee.

The committee received written comments from Mr. Kimura, the regulator representing the County of Santa Cruz, CA who presented during open hearings. Written comments included specific, proposed changes to the item which were referred to in open hearings and that were represented in the letter submitted by CACASA. The committee heard from a member of industry in support of the item and considered the National Electrical Manufacturers Association (NEMA) presentation posted on NCWM's website.

The committee considered the edits submitted by Mr. Kimura and cross-referenced those changes to the NIST OWM Electric Watthour Subgroup – Recommended Crosswalk. The committee has decided to incorporate the recommended edits from NIST OWM's crosswalk into the item under consideration to be forwarded to the regions. Additional changes recommended by Mr. Kimura are available for review on the NCWM website.

Regional Associations' Comments:

CWMA 2023 Interim Meeting: No comments were heard.

The committee recommends this item as informational.

WWMA 2023 Annual Meeting: During the WWMA 2023 annual meeting:

The proposed language for consideration is posted on the WWMA website {Events – Meeting Documents – OTH-16.1 Recommended Edits Agenda Item}. Comments heard on the floor were regarding the proposed updated language.

Austin Shepard (San Diego County, California): Supports this item moving forward as a Voting item with the proposed changes as posted on the WWMA website.

Due to the substantial changes to the proposed language the WWMA S&T Committee recommends this item remain Informational to allow the body of the NCWM the opportunity to review those proposed changes and provide feedback to the NCWM S&T Committee. The committee further recommends the NCWM S&T Committee consider the updates provided by Andrew Kimura – Santa Cruz County California in their deliberations.

The proposed language will be included in the WWMA S&T Committee 2023 Final Report as an Appendix to the item. Additional documentation of these changes will be published on NCWM's website. SWMA 2023 Annual Meeting: Andrew Kimura, Santa Cruz County, California, submitted a letter detailing many recent changes to this item ahead of our annual meeting.

Lisa Warfield, OWM, asked the Committee if they were considering the printed language or the language submitted by Andrew Kimura at the NCWM Interim.

The committee will consider this item with Mr. Kimura's most recent revisions.

The committee recommends this item remain an Informational item, so that the NCWM S&T Committee can continue to develop it with the opportunity to escalate it to voting status after the NCWM Interim Meeting.

NEWMA 2023 Interim Meeting: No comments were heard on this item and the Committee does not have a recommendation.

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

OTH-24.1 Appendix D, Definitions: liquefied petroleum gas retail motor-fuel device.

Source:

National Propane Gas Association

Purpose:

The proposal is a companion to the main proposal to modify 3.32, S.2.5.1 and S.2.5.2. There is another proposal that will substitute the term “liquefied petroleum gas retail motor-fuel device” for the terms “retail motor-fuel dispenser” and “retail motor-fuel device” throughout 3.32.

Item under Consideration:

Amend Handbook 44 Appendix D, Definitions as follows:

liquefied petroleum gas retail motor-fuel device. – A device designed for the measurement and delivery of liquefied petroleum gas used as a fuel for internal combustion engines in vehicles bearing a state or federal license plate for use on public roads. The device can be operated either by trained personnel or the customer. The term means the same as “retail motor fuel dispenser” and “retail motor fuel device” as it appears in section 3.32 LPG and Anhydrous Ammonia Liquid Measuring Devices. [3.32]

Note: These devices are required to be listed to UL 495 Power-Operated Dispensing Devices for LP-Gas and equipped with a Type K15 nozzle in accordance with ISO/DIS 19825, Road vehicles- Liquefied petroleum gas refueling connector.

Previous Status:

2024: New Proposal

Original Justification:

This is a companion to this group’s proposal to 3.32, S.2.5.1 and S.2.5.2. The proposed change to the definition will more precisely define what a liquefied petroleum gas retail motor-fuel device is. This is a UL-listed device that is electricity-powered and that has all of the features required by Handbook 44. It includes a safety nozzle that connects to the fill valve on the vehicle which will not flow gas unless a positive connection is made. These devices are required by NFPA 58 for all LP-gas dispensers installed at refueling facilities open to the public.

Opposition would most likely come from those opposed to the primary changes in S.2.5.1 and S.2.5.2. Opposition may also come from those concerned about vehicles that do not have the K15 mating connection on the fill valve of the vehicle. Rebuttal to that would be that propane industry sources indicate that older vehicles that do not have the K15 connection are being retrofit at a high rate to incorporate the safety features of the K15 connection. The submitter requested Voting status in 2024.

Comments in Favor:**Regulatory:**

•

Industry:

•

Advisory:

•

Comments Against:**Regulatory:**

•

Industry:

-

Advisory:

-

Neutral Comments:

Regulatory:

-

Industry:

-

Advisory:

-

Item Development:

New Proposal

Regional Associations' Comments:

New Proposal

CWMA 2023 Interim Meeting: No comments were heard.

The committee recommends this item as voting item blocked with item LPG 24.1.

WWMA 2023 Annual Meeting: During the WWMA 2023 annual meeting comments were heard on LPG-24.1, LPG-24.2, and OTH-24.1 collectively:

Mr. Kevin Schnepf (California Div. of Measurement Standards): Recommended items LPG-24.1, LPG-24.2, and OTH-24.1 be blocked. Mr. Scott Simmons (Colorado Div. of Oil and Public Safety) agreed.

Mr. Scott Simmons (Colorado Div. of Oil and Public Safety): Commented that the items clarify what an LPG RMFD is, and that the zero-setback interlock requirement is only intended to apply to LPG RMFD, for example a standalone dispenser on an island. The result of applying this requirement to other LPG devices may negatively impact businesses and consumers through a rise in cost.

Mr. Kurt Floren (Los Angeles County, California) and Scott Simmons (Colorado Div. of Oil and Public Safety) had a discussion regarding the possibility of clarifying existing language in NIST HB 44 3.32 S.2.5.1 and S.2.5.2. which most find confusing. Mr. Kenn Burt (San Luis Obispo County, California) suggested that merging sections S.2.5.1. and S.2.5.2. might be a method of addressing the confusion of how to apply the code sections.

Mr. Kevin Schnepf (California Div. of Measurement Standards): Questioned whether the intent of the items could better be addressed by exempting analog LPG devices from a zero-setback interlock requirement.

During open hearings there was a consensus of support for the items and a request to Block the three items. There were comments that this may be an opportunity to clarify existing language in HB 44 which most find confusing, and possibly merging S.2.5.1 and S.2.5.2. A question was also posed to the body to address the intent of the item by exempting analog devices from a Zero Set Back Interlock requirement.

Based on the comments heard during the open hearings the WWMA S&T Committee recommends this item be Blocked with LPG-24.2 and OTH-24.1 and that the Blocked items be assigned a Developing status to allow the body an opportunity to review the new language and allow the submitter to address the comments heard during open hearings.

SWMA 2023 Annual Meeting: The committee did not receive any comment on this item during Open Hearings.

The committee supports the modification of the definition for Liquefied Petroleum Gas Retail Motor-fuel Device.

The committee recommends blocking this item with LPG-24.1 and LPG-24.2.

The committee recommends moving this item forward as a Developing item.

NEWMA 2023 Interim Meeting: The States of New York and New Jersey, and the Commonwealth of Massachusetts recommend this item be developing as it is a companion to LPG-24.1. Upon consensus of the body, the Committee recommends this item be Developing.

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-24.2 Appendix D, Definitions: National Type Evaluation Program (NTEP) and Certificate of Conformance (CC)

Source:

Jerry Buendel

Purpose:

Add a definition of Certificate of Conformance (CC) and a definition of National Type Evaluation Program (NTEP) to Handbook 44, Appendix D.

Item under Consideration:

Amend Handbook 44 Appendix D, Definitions as follows:

Certificate of Conformance (CC) - A document issued based on testing by a Participating Laboratory, which the certificate holder maintains in active status under the National Type Evaluation Program (NTEP). The document constitutes evidence of conformance of a model or models of a particular device, measurement system, instrument, or element that positively identifies the design with the requirements of this document, NIST Handbook 44, "Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices," and the test procedures contained in NCWM Publication 14. By maintaining the Certificate in active status, the Certificate holder declares the intent to continue to manufacture or remanufacture the device consistent with the type and in conformance with the applicable requirements. A device is traceable to an active CC if: (a) it is of the same type identified on the Certificate, and (b) it was manufactured during the period that the Certificate was maintained in active status. For manufacturers of grain moisture meters, maintenance of active status also involves annual participation in the NTEP Laboratory On-going Calibration Program, OCP (Phase II). Some certificates may be designated as inactive. An inactive Certificate of Conformance is a Certificate which was previously active, but the devices are no longer being manufactured for commercial applications subject to local regulations or laws. However, devices already manufactured, installed or in inventory, but not yet sold, may be used, sold, repaired and resold under inactive Certificates of Conformance.

National Type Evaluation Program (NTEP) – A program operated by NCWM. NTEP is a program of cooperation between the NCWM, NIST, other federal agencies, the states, and the private sector for determining, on a uniform basis, conformance of a model or models of a particular device, measurement system, instrument, or element that positively identifies the design with the relevant provisions of NIST Handbook 44, "Specifications, Tolerances,

1 and Other Technical Requirements for Weighing and Measuring Devices,” and NCWM, Publication 14,
2 “National Type Evaluation Program, Technical Policy, Checklists, and Test Procedures.”

3 **Previous Status:**

4 2024: New Proposal

5 **Original Justification:**

- 6 • The term National Type Evaluation Program (NTEP) is used in the General, Scales, Automatic Weighing System,
7 Hydrogen Gas-Measuring, Electric Vehicle Fueling Systems, Grain Moisture Meter, Near-Infrared Grain
8 Analyzers, and Multiple Dimension Measuring Devices codes, and in Appendix A. Fundamental Considerations.
9 • Some users of the Handbook, including regulatory officials, have little or no knowledge of NTEP and the
10 significance of Certificates of Conformance.
11 • The terms NTEP and Certificate of Conformance appear in NCWM’s Basic Competency, Professional
12 Certification, and Service Agent examinations. Examinees are expected to be able to understand NTEP CCs and
13 apply information found on the CCs.
14 • The definition for NTEP and CC are taken from NIST Handbook 130, Uniform Regulation for National Type
15 Evaluation. The statements on inactive CCs are taken from the NCWM website, NTEP Frequently Asked
16 Questions page.
17 • The absence of definitions could cause enforcement or other legal issues.

18 The submitter requested Voting status for 2024.

19 **Comments in Favor:**

20 **Regulatory:**

- 21 •

22 **Industry:**

- 23 •

24 **Advisory:**

- 25 •

26 **Comments Against:**

27 **Regulatory:**

- 28 •

29 **Industry:**

- 30 •

31 **Advisory:**

- 32 •

33 **Neutral Comments:**

34 **Regulatory:**

- 35 •

Industry:

-

Advisory:

-

Item Development:

New Proposal

Regional Associations' Comments:

New Proposal

CWMA 2023 Interim Meeting: Greg VanderPlaats from Minnesota stated that Jerry Buendel proposed this item because in developing tests for service agents on the national level it was discovered that those terms are not defined in Handbook 44. Service people will have questions on these definitions. Recommend voting status for this item.

The committee recommends this item as voting.

WWMA 2023 Annual Meeting: During the WWMA 2023 annual meeting comments were heard from California, Arizona, and Oregon. The consensus was in support for the item, as it is needed. Comments were also heard suggesting simplifying both definitions and possibly removing the language regarding policy.

Based on the comments heard during the open hearings the WWMA 2023 S&T Committee recommends that this item be assigned a Developing status and recommends the submitter address the comments heard during open hearings.

SWMA 2023 Annual Meeting: The committee heard no comments on this item during Open Hearings.

The committee approves of defining these terms but acknowledges the language could be cleaned up some in regard to the differences in Active and Inactive status. Clarifying that both active and inactive certificates are both Certificates of Conformance. We would suggest striking "which the certificate holder maintains in active status" from the first sentence of the Certificate of Conformance definition (Lines 24-25.)

The committee recommends this item move forward as a Voting item.

NEWMA 2023 Interim Meeting: The States of New Hampshire, New Jersey, New York, and the Commonwealth of Massachusetts support voting. Upon consensus of the body, the Committee recommends this item be Voting.

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) TRANSFER STANDARD

Source:

California Department of Food and Agriculture, Division of Measurement Standards

B1-LMD-24.1 ~~N.3.5.X. Field Standard Meter Test~~ N.3.5.X. Transfer Standard Test.

Purpose:

Replace the undefined term "Field Standard Meter" with the defined term "Transfer Standard", harmonize the language in the paragraph with existing language in other sections regarding tests using transfer standards, and remove the non-retroactive status from the section.

Item under Consideration:

Amend Handbook 44 Liquid Measuring Devices Code as follows:

~~*N.3.5.X. Field Standard Meter Test. — The minimum quantity for any test draft shall be equal to or greater than the amount delivered in one minute at the flow rate being tested.
(Added 2023)
[Nonretroactive as of January 1, 2023]*~~

**N.3.5.X. Transfer Standard Test. – When comparing a meter with a calibrated transfer standard, the minimum quantity for any test draft shall be equal to or greater than the amount delivered in one minute at the flow rate being tested.
(Added 2023) (Amended 20XX)**

Previous Status:

2024: New Proposal

B1-VTM-24.1 ~~*N.3.5.X. Field Standard Meter Test*~~**N.3.5.X. Transfer Standard Test.**

Purpose:

Replace the undefined term “Field Standard Meter” with the defined term “Transfer Standard”, harmonize the language in the paragraph with existing language in other sections regarding tests using transfer standards, and remove the non-retroactive status from the section.

Item under Consideration:

Amend Handbook 44 Vehicle Tank Meters Code as follows:

~~*N.3.X. Field Standard Meter Test. — The minimum quantity for any test draft shall be equal to or greater than the amount delivered in one minute at the flow rate being tested.
(Added 2023)
[Nonretroactive as of January 1, 2023]*~~

**N.3.X. Transfer Standard Test. – When comparing a meter with a calibrated transfer standard, the minimum quantity for any test draft shall be equal to or greater than the amount delivered in one minute at the flow rate being tested.
(Added 2023) (Amended 20XX)**

Previous Status:

2024: New Proposal

Original Justification:

If the term “Field Standard Meter”, which is undefined, remains in NIST HB 44 this will lead to confusion regarding what a “Field Standard Meter” is. This proposal is intended to remove this confusion by replacing this term with one that is defined in NIST HB 44. The item is a test note which would only apply to tests of devices moving forward, the item also identifies when it was added to NIST HB 44, therefore a non-retroactive status is not necessary.

The section to be amended was recently added to NIST HB 44. There may be an additional purpose regarding the non-retroactive status of the section.

The submitter requested Voting status for this item in 2024 as a retroactive provision.

B1-LPG-24.3 ~~*N.3.2. Field Standard Meter*~~**Transfer Standard Test.**

Purpose:

Replace the undefined term “Field Standard Meter” with the defined term “Transfer Standard” and harmonize the language in the paragraph with existing language in other sections regarding tests using transfer standards.

Item under Consideration:

Amend Handbook 44 Liquefied Petroleum Gas and Anhydrous Ammonia Liquid-Measuring Devices Code as follows:

~~N.3.2. Field Standard Meter~~ **Transfer Standard** Test. – **When comparing a meter with a calibrated transfer standard,** the minimum quantity for any test draft shall be equal to or greater than the amount delivered in one minute at the flow rate being tested.
(Added 2023) (Amended 20XX)

Previous Status:

2024: New Proposal

Original Justification:

If the term “Field Standard Meter”, which is undefined, remains in NIST HB 44 this will lead to confusion regarding what a “Field Standard Meter” is. This proposal is intended to remove this confusion by replacing this term with one that is defined in NIST HB 44.

The section to be amended was recently added to NIST HB 44.

The submitter requested Voting status for this item in 2024 as a retroactive provision.

B1-MLK-24.1 ~~*N.3.2. Field Standard Meter Test.*~~ **N.3.2. Transfer Standard Test.**

Purpose:

Replace the undefined term “Field Standard Meter” with the defined term “Transfer Standard”, harmonize the language in the paragraph with existing language in other sections regarding tests using transfer standards, and remove the non-retroactive status from the section.

Item under Consideration:

Amend Handbook 44 Milk Meters Code as follows:

~~*N.3.2. Field Standard Meter Test. —The minimum quantity for any test draft shall be equal to or greater than the amount delivered in one minute at the flow rate being tested.*~~
~~*(Added 2023)*~~
~~*[Nonretroactive as of January 1, 2023]*~~

N.3.2. Transfer Standard Test. – When comparing a meter with a calibrated transfer standard, the minimum quantity for any test draft shall be equal to or greater than the amount delivered in one minute at the flow rate being tested.
(Added 2023) (Amended 20XX)

Previous Status:

2024: New Proposal

Original Justification:

If the term “Field Standard Meter”, which is undefined, remains in NIST HB 44 this will lead to confusion regarding what a “Field Standard Meter” is. This proposal is intended to remove this confusion by replacing this term with one

that is defined in NIST HB 44. The item is a test note which would only apply to tests of devices moving forward, the item also identifies when it was added to NIST HB 44, therefore a non-retroactive status is not necessary.

The section to be amended was recently added to NIST HB 44. There may be an additional purpose regarding the non-retroactive status of the section.

The submitter requested Voting status for this item in 2024 as a retroactive provision.

B1-MFM-24.1 N.3.2. ~~Field Standard Meter~~ Transfer Standard Test.

Purpose:

Replace the undefined term “Field Standard Meter” with the defined term “Transfer Standard”, harmonize the language in the paragraph with existing language in other sections regarding tests using transfer standards, and remove the non-retroactive status from the section.

Item under Consideration:

Amend Handbook 44 Milk Meters Code as follows:

N.3.2. ~~Field Standard Meter~~ Transfer Standard Test. – **When comparing a meter with a calibrated transfer standard,** the minimum quantity for any test draft shall be equal to or greater than the amount delivered in one minute at the flow rate being tested except for tests of the minimum measured quantity specified for the meter.
(Added 2023) (**Amended 20XX**)

Previous Status:

2024: New Proposal

Original Justification:

If the term “Field Standard Meter”, which is undefined, remains in NIST HB 44 this will lead to confusion regarding what a “Field Standard Meter” is. This proposal is intended to remove this confusion by replacing this term with one that is defined in NIST HB 44.

The section to be amended was recently added to NIST HB 44.

The submitter requested Voting status for this item in 2024 as a retroactive provision.

Comments in Favor:

Regulatory:

-

Industry:

-

Advisory:

-

Comments Against:

Regulatory:

-

Industry:

-

Advisory:

-

Neutral Comments:

Regulatory:

-

Industry:

-

Advisory:

-

Item Development:

New Proposal

Regional Associations' Comments:

New Proposal

CWMA 2023 Interim Meeting: No comments were heard.

The committee recommends this block as voting.

WWMA 2023 Annual Meeting: Due to the WWMA S&T Committee Chairman being a submitter of this item, Matt Douglas (California Department of Food and Agriculture, Division of Measurement Standards) abstained from the committee during open hearings, committee work sessions, and the voting session.

During the WWMA 2023 annual meeting the following comments were received:

Matt Douglas (California, CDFA, DMS): Clarified the intent of this item is to replace undefined terms with HB44 defined terms recently adopted at the 2023 NCWM Annual Conference.

Based on comments from the floor there was consensus with the item moving forward with a Voting status. Clarifying questions were asked and answered with sufficient responses during open hearings regarding the newly adopted definitions (Type 1 & Type 2 Transfer Standard) and the non-retroactive status removal from the code sections as they are in the notes section of HB44.

The WWMA S&T Committee recommended this item be assigned a Voting status. In review of this item and based on comments heard from the body, this committee feels this Block of items is fully developed, has merit, and meets the intended purpose.

SWMA 2023 Annual Meeting: The committee heard no comments on this item during Open Hearings.

The committee supports this item as it harmonizes the language used in these codes with existing language in other related sections of the handbook.

The committee recommends this item move forward as a Voting item.

- 1 NEWMA 2023 Interim Meeting: The States of New Hampshire, New Jersey and New York supports voting. Upon
- 2 consensus of the body, the Committee recommends this item be Voting.
- 3 Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to
- 4 <https://www.ncwm.com/publication-15> to review these documents.

Mr. Jason Flint, New Jersey | Committee Chair
Mr. David Aguayo, San Luis Obispo County, California | Vice-Chair
Mr. Brett Willhite, Minnesota | Member
Mr. James Willis, New York | Member
Mr. Mark Lovisa, Louisiana | Member
Mr. Éric Turcotte, Measurement Canada | Canadian Technical Advisor
Mr. Loren Minnich, NIST OWM | NIST Technical Advisor
Ms. Juana Williams, NIST, OWM | NIST Technical Advisor
Mr. Allen Katalinic, NCWM | NTEP Technical Advisor
Mr. Jeff Gibson, NCWM | NTEP Technical Advisor
Mr. Greg Gholston, Mississippi | Committee Coordinator

Specifications and Tolerances Committee

APPENDIX A

Item SCL-23.3 – Final Report of the Verification Scale Division Task Group

Note: This appendix originally appeared for Item Block 2 - Define True Value For Use In Error Calculations, which was withdrawn and replaced by SCL-23.3 - Verification Scale Division e: Multiple Sections Including, T.N.1.3., Table 6., T.N.3., T.N.4., T.N.6., T.N.8., T.N.9., T.1., T.2., S.1.1.1., T.N.1.2., Table S.6.3.a., Table S.3.6.b., Appendix D, S.1.2.2., Table 3., S.5.4., UR.3., Table 8. The Committee decided to preserve the appendix, since it remains relevant to item SCL-23.3.

Participants:

Doug Musick, Chair (KS)
Ross Andersen (NY, Retired and original submitter of the item)
John Barton (NIST OWM)
Luciano Burtini (Measurement Canada)
Anthony Bong Lee (Orange County, CA)
Steve Cook (CA, Retired)
Darrell Flocken (NTEP)
Eric Golden (Cardinal Scale)
Jan Konijnenburg (Rice Lake Weighing Systems)
Richard Suiter (Richard Suiter Consulting)
Steve Timar (NY)
Howard Tucker (FL)

The mission of the task group, as defined by the S&T Committee, is to review Handbook 44, Section 2.20. Scales and relevant portions of OIML R76, using the items included in S&T Agenda Items: Block 2 as a reference point, and recommend changes as necessary to:

5. Clarify how the error is determined in relation to the verification scale division (e) and the scale division (d)
6. Clarify which is the proper reference; the verification scale division (e) or the scale division (d) throughout this section
7. Ensure proper selection of a scale in reference to the verification scale division (e) and the scale division (d)
8. Clarify the relationship between the verification scale division (e) or the scale division (d)

This report is divided into three sections:

1. Clarify the relationship between e and d, i.e., ensure we understand the terms. (Mission items 4 and 1)
2. Propose changes to the Scales Code, if necessary, to ensure the code correctly identifies e or d as appropriate to the code paragraph. (Mission items 2 and 3)
3. Address other issues that arose as potential problems that might require additional investigation beyond the scope of this workgroup.

PART 1. Clarify the Relationship Between e and d.

We begin by looking at current HB44 definitions. The verification scale division e is used to express tolerance values and it is used in classification. The designations of e and the accuracy class are made by the manufacturer. The scale division d is a function of the actual scale function and display. Note that for weight classifiers, the weighing instrument may never display quantity at the resolution of e, and for ungraduated devices there is no scale division d to permit comparison to e.

verification scale division, value of (e). – A value, expressed in units of weight (mass) and specified by the manufacturer of a device, by which the tolerance values and the accuracy class applicable to the device are determined. The verification scale division is applied to all scales, in particular to ungraduated devices since they have no graduations. The verification scale division (e) may be different from the displayed scale division (d) for certain other devices used for weight classifying or weighing in pre-determined amounts, and certain other Class I and II scales.[2.20]

scale division, value of (d). – The value of the scale division, expressed in units of mass, is the smallest subdivision of the scale for analog indication or the difference between two consecutively indicated or printed values for digital indication or printing. (Also see “verification scale division.”) [2.20, 2.22]

scale division, number of (n). – Quotient of the capacity divided by the value of the verification scale division. [2.20]

$$n = \frac{\text{Capacity}}{e}$$

The values of e and d must be understood as referring to different things. The verification scale refers to the scale of measurement for the reference (or true value), think of the reference standard. The instrument scale refers to the scale of measurement of the instrument under test. Consider this assortment of instruments in the table below. It should be clear that the divisions of the verification scale do not always equal those on the instrument scale and may not even be in the same units. In addition, when we employ an artifact, like a test weight or slicker plate measure, the divisions of the verification scale are not visible since the artifact represents a single point on the measurement scale of the reference.

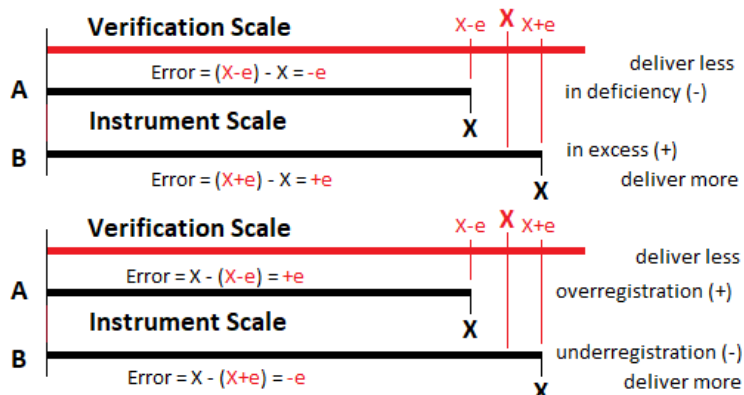
Instrument Scale	Scale div d	Verification “True Value” Scale	Scale div e	Relation e to d
Rule	1/16 in	Standard Rule or Tape	1/16 in	$e = d$
Taximeter	1/10 mi	Road Course	2 ft	$e \ll d$
LMD’s	0.1 gal	Prover indication	5 cu in	$e > d$
Mass Flow Meter	1 lb	Reference Scale	0.01 lb	$e < d$
Weighing Devices	0.01 lb	Test Weight (artifact)	mfr choice	$e < d, e = d, e > d$
Test Measure	1 cu in	Slicker Plate (artifact)	?	$e ? d$

For weighing instruments, it turns out that e and d have no fixed relationship. It is different for weight classifiers ($e < d$), for most instruments ($e = d$), and for high resolution instruments ($e > d$). The critical point is that the instrument scale and the verification scale are independent of each other. Once you have disconnected e (declared by the manufacturer) from d (displayed on the instrument), it may now become evident that much of our confusion arose because we thought of them as connected in some way.

In the graphics below both error and tolerance are always expressed in terms of the divisions (e) of the verification scale. The primary assumption is that the verification scale is constant, and it is the displayed scales of the instruments we test that move. The scales in black are depicted as in error by $+1 e$ or $-1 e$.

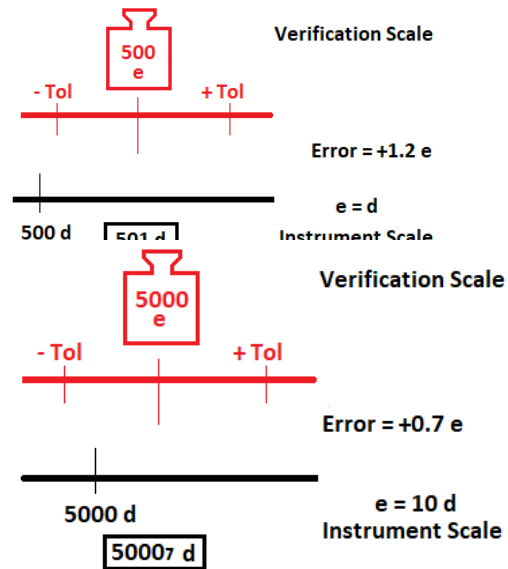
Error of delivery =
 verification scale – instrument scale
 + in excess
 – in deficiency

Error of Indication =
 instrument scale – verification scale
 + over registration
 – underregistration



Much of our confusion arises because scales are tested using artifacts with no visible scale divisions. We could mirror this in the test of a fuel dispenser. Normally you stop the test at 5 gallons on the instrument scale and read the error as -3 cu in from the test measure (verification) scale. Now change that procedure and stop the test at the zero mark on the test measure. How would you determine the error? Assume the instrument now reads 5.012 gal. The error is -0.012 gal (-3 cu in), and we calculate it as verification scale – instrument scale. We determined the error from the instrument scale. The verification scale division, however, did not switch from the test measure to the instrument simply because we changed the procedure. The verification scale division remains 1 cu in and is still on the test measure, the reference.

Consider the Class III scale at right where $e = d$. Technically you can't see divisions on either scale since the artifact has no visible divisions and the instrument is digital. The correct instrument indication of 500 d is 1.2 e short of 500 e on the verification scale. You could mirror this by applying 498.8 e of test weights to get indication of 500 d. It is not in tolerance, but only if you apply error weights in your test.



Consider the Class II scale at right where $e = 10 d$. You can't see divisions on either scale because the test weight is an artifact and the instrument are digital. The correct instrument indication of 50,000 d is short of the 5,000 e on the verification scale by 7 d. Thus, we say the error is $+0.7 e$. Error = instrument scale – verification scale. This instrument is clearly in tolerance. No error weights are necessary to see to finer than 1 e.

The principles of classification are found in the following HB44 paragraphs. In principle, the manufacturer tells the official what accuracy is to be applied to the instrument.

T.N.1. Principles.

T.N.1.1. Design. – The tolerance for a weighing device is a performance requirement independent of the design principle used.

T.N.1.2. Accuracy Classes. – Weighing devices are divided into accuracy classes according to the number of scale divisions (n) and the value of the scale division (d).

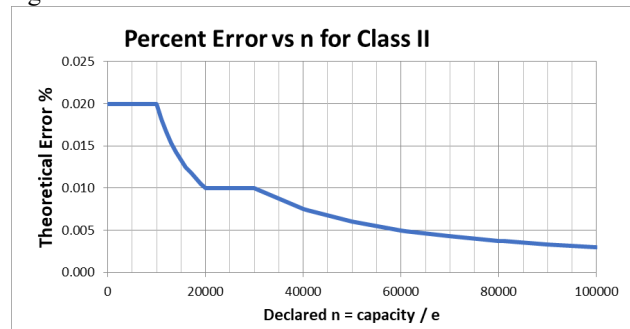
T.N.1.3. Scale Division. – The tolerance for a weighing device is related to the value of the scale division (d) or the value of the verification scale division (e) and is generally expressed in terms of d or e.

Yet, the T.N.1.2. and T.N.1.3. paragraphs conflict with the definitions. According to the definition of e, it is e "by which the tolerance values and the accuracy class applicable to the device are determined." When the Scales Code was drafted prior to adoption in 1984, it appears some things were lost in translation from the OIML R76 on which it was based. What was lost can be expressed as those things not included in HB44 and those things incorrectly translated in HB44.

For example, R76 expresses the classification information in four required markings, and one auxiliary marking. R76 requires marking of Class, Max, e, and Min, and requires marking of d if different from e. Those markings describe the maximum and minimum loads and the relative accuracy. In contrast, HB44 requires marking of Class, capacity, and d, and requires marking of e if different from d. HB44 does not require marking of minimum load. While R76 considers minimum load part of the class structure, HB44 does not.

It is this switch of e and d that causes confusion because the translation of R76 to HB44 lost some of the meaning. Much of the second part of this report covers the changes required to rectify the situation. The workgroup is attempting to ensure the Code states e when the requirement applies to e and d when it applies to d. The workgroup is also proposing to add important material from R76 that is missing.

Some additional confusion comes from the stepped tolerance structure. For example, it is common to think that the instrument gets 1 division of error over the first tolerance step (maintenance). The correct interpretation of the code requires the instrument maintain a % accuracy based on the number of divisions of load at the break points. The space under the step riser is not supposed to be used by the instrument provided you eliminate the rounding error.



Between 1 division and 10,000 divisions for Class II in R76, this is 0.02%. At 10,000 e, 0.02% is 2 e. At 1,000 e, 0.02% is 0.2 e, and at minimum load of 50 e, 0.02% is 0.01 e. The principle is: the larger the number of verification scale divisions (n) the more accurate the instrument must be, i.e. relative error. Section 2.2 of R76 makes this clear by stating that e represents absolute accuracy and n represents relative accuracy. The Scales Code has no parallel section. It is the relative accuracy that should be our focus, but that's not found in HB44.

PART 2. Proposed changes to the Scales Code (related issues are grouped for convenience)

Group 1. Changes to clarify definitions relating to e.

verification scale division, value of (e). – A value, expressed in units of weight (mass) and specified by the manufacturer of a device, by which the tolerance values and the accuracy class applicable to the device are determined. The verification scale division is applied to all scales, in particular to ungraduated devices since they have no graduations. ~~The verification scale division (e) may be different from the displayed scale division (d) for certain other devices used for weight classifying or weighing in pre-determined amounts, and certain other Class I and II scales.~~ [2.20]

(Amended 20XX)

The last sentence is explained fully in the technical requirements in the Code. The workgroup finds it unnecessary and believe it contributes to confusion.

verification scale division, number of (n). – Quotient of the capacity divided by the value of the verification scale division. [2.20]

$$n = \frac{\text{Capacity}}{e}$$

(Amended 20XX)

scale division, number of (n). – See “verification scale division, number of (n)”

The addition of the word “verification” to the definition of n is essential since without it the section refers to the scale division d. The second definition for n was added as a cross reference since the revision will move from the s section to the v section.

Group 2. Changes to ensure proper classification of instruments.

T.N.1.2. Accuracy Classes. – Weighing devices are divided into accuracy classes according to the number of verification scale divisions (n) and the value of the verification scale division ~~(d)~~ (e).

(Amended 20XX)

T.N.1.3. Verification Scale Division. – The tolerance for a weighing device is ~~related to the value of the scale division (d) or the value of the~~ in the order of magnitude of the verification scale division (e) and is generally expressed in terms of ~~d or e~~.

(Amended 20XX)

These changes bring the principles in the T.N. section in agreement with the definitions. Classification is exclusively based on e.

Table 3. Parameters for Accuracy Classes			
Class	Value of the Verification Scale Division (d or e ¹)	Number of <u>Verification Scale</u> ⁴ Divisions (n)	
		Minimum	Maximum
SI Units			
I	equal to or greater than 1 mg	50 000	--
II	1 to 50 mg, inclusive	100	100 000
III ^{2,5}	equal to or greater than 100 mg	5 000	100 000
	0.1 to 2 g, inclusive	100	10 000
	equal to or greater than 5 g	500	10 000
III L ³	equal to or greater than 2 kg	2 000	10 000
III	equal to or greater than 5 g	100	1 200

¹ ~~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 “e” is the value of the scale division immediately preceding the auxiliary means. The verification scale division e does not always equal the displayed scale division d. To ensure the correct value for e is used, refer to required markings on the device (see also notes 3 and 4 in Table S.6.3.b.).~~

² A Class III scale marked “For prescription weighing only” may have a verification scale division (e) not less than 0.01 g.

(Added 1986) (Amended 2003)

³ The value of a verification scale division for crane and hopper (other than grain hopper) scales shall be not less than 0.2 kg (0.5 lb). The minimum number of verification scale divisions, n, shall be not less than 1000.

⁴ On a multiple range or multi-interval scale, the number of verification divisions, n, for each range independently shall not exceed the maximum specified for the accuracy class. The number of verification scale divisions, n, for each weighing range is determined by dividing the scale capacity for each range by the verification scale division, e, for each range. On a scale system with multiple load-receiving elements and multiple indications, each element considered shall not independently exceed the maximum specified for the accuracy class. If the system has a summing indicator, the n_{max} for the summed indication shall not exceed the maximum specified for the accuracy class.

(Added 1997)

⁵ The minimum number of verification scale divisions, n, for a Class III Hopper Scale used for weighing grain shall be 2000.)

[Nonretroactive as of January 1, 1986]

(Amended 1986, 1987, 1997, 1998, 1999, 2003, ~~and~~ 2004 and 20XX)

The middle section of the table was not included for brevity. Notes continue below:

The changes to the header of Table 3 ensure the classification is based on e consistent with the definitions and the principles in T.N.1. The scale division d is not involved in classification. This change should reduce confusion. The changes to the notes at the bottom of the table again ensure e is correctly referenced instead of d or the “scale division.” Referencing “n” in notes 3, 4, and 5 ensure that it is referring to e since $n = \text{capacity} / e$.

Table S.6.3.a. Marking Requirements					
To Be Marked With ↓	Weighing Equipment				
	Weighing, Load-Receiving, and Indicating Element in Same Housing or Covered on the Same CC¹	Indicating Element not Permanently Attached to Weighing and Load-Receiving Element or Covered by a Separate CC	Weighing and Load-Receiving Element Not Permanently Attached to Indicating Element or Covered by a Separate CC	Load Cell with CC (11)	Other Equipment or Device (10)
Manufacturer’s ID (1)	X	X	X	X	X
Model Designation and Prefix (1)	X	X	X	X	X
Serial Number and Prefix (2)	X	X	X	X	X (16)
Certificate of Conformance Number (CC) (23)	X	X	X	X	X (23)
Accuracy Class (17)	X	X (8)	X (19)	X	
Nominal Capacity (3)(18)(20)	X	X	X		
Value of Scale Division, “d” (3 4)	X	X			
Value of <u>Verification Scale Division</u> , “e” (4 <u>3</u>)	X	X			
Temperature Limits (5)	X	X	X	X	

Note: The remainder of the table was not included for brevity.

The changes to column 1 in the 7th and 8th rows simply reverse the references to the notes in Table S.6.3.b. They reflect the primacy of e in classification, which is addressed in parallel changes to notes 3 and 4 in Table S.6.3.b. (see changes to Table S.6.3.b. below).

<p style="text-align: center;">Table S.6.3.b. Notes for Table S.6.3.a. Marking Requirements</p>	
1.	<p>Manufacturer's identification and model designation and <i>model designation prefix</i>.*</p> <p><i>[*Nonretroactive as of January 1, 2003]</i></p> <p>(Also see G-S.1. Identification.) <i>[Prefix lettering may be initial capitals, all capitals or all lower case]</i></p> <p>(Amended 2000)</p>
2.	<p><i>Serial number [Nonretroactive as of January 1, 1968] and prefix [Nonretroactive as of January 1, 1986].</i> (Also see G-S.1. Identification.)</p>
3.	<p>The device shall be marked with the nominal capacity. <i>The nominal capacity shall be shown together with the value of the <u>verification scale division</u>, “e” (e.g., 15 × 0.005 kg, 30 × 0.01 lb, or capacity = 15 kg, d e = 0.005 kg) in a clear and conspicuous manner and be readily apparent when viewing the reading face of the scale indicator unless already apparent by the design of the device. Each <u>verification scale division value</u> or weight unit <u>with its associated nominal capacity</u> shall be marked on multiple range or multi-interval scales. <u>In the absence of a separate marking of the scale division “d” (see Note 4), the value of the scale division “d” shall be equal to the value of the verification scale division “e.”</u></i></p> <p><i>[Nonretroactive as of January 1, 1983]</i></p> <p>(Amended 2005 <u>and 20XX</u>)</p>
4.	<p><i>Required only if different from “d” “e.” This does not apply to an ungraduated device (equal arm scale) where the graduations do not refer to a fixed weight value.</i></p> <p><i>[Nonretroactive as of January 1, 1986]</i></p> <p><u>(Amended 20XX)</u></p>

The original Scales Code adopted 1984 made d the primary mandatory marking but this resulted in confusion. The changes make e the mandatory marking and now requires d only if different from e.

The changes regarding multiple range and multi-interval scales makes the note say what we have always been applying. The intent was for each range or subrange of the instrument to have marking of capacity and e. The “or weight unit” could refer to lb or kg, but that is clearly not the intent.

There is some concern if this might pose problems for existing equipment. If the marking is of the form “capacity 30 lb x 0.01 lb” the workgroup sees not conflict. However, markings in the form “capacity = 30 lb d = 0.01 lb” would cause a conflict as devices using that form would no longer conform with the proposed changes. The workgroup decided to refer this to the scale manufacturers to see if there are any devices in the marketplace that would be affected. We also learned that this might cause a conflict with Measurement Canada as they do see devices with markings of capacity= d=. Note this is not an issue when e ≠ d as both markings is already required by the combination of notes 3 and 4. If necessary, a note with qualification “devices manufactured before January 1, 20XX” could be added to accept existing scales marked with d = provided d = e.

S.1.2.2. Verification Scale ~~Interval~~ Division

The magnitude of the verification scale division e relative to the scale division d for different types of devices is given in Table S.1.2.2. Relative Magnitude of e to d.

Table S.1.2.2. Relative Magnitude of e to d	
<u>Type of device (see Note)</u>	<u>Relative magnitude of e to d</u>
<u>Graduated, without an auxiliary indicating device</u>	<u>$e = d$</u>
<u>Graduated, with an auxiliary indicating device</u>	<u>$e > d$ and e is chosen by the manufacturer according to Table 3. and S.1.2.2.1.</u>
<u>Graduated, and marked for use in special applications (weight classifier)</u>	<u>$e \leq d$ and e is chosen by the manufacturer according to Table 3. and S.1.2.2.4.</u>

Note: Ungraduated devices, e.g. equal arm balances where the scale graduations do not represent a fixed weight quantity, are not included in this table since they have no scale divisions (d) to permit comparison with (e).

S.1.2.2.1. Class I and II Scales and Dynamic Monorail Scales. – If $e \neq d$, the verification scale ~~interval~~ division “e” shall be determined by the expression:

$$d < e \leq 10 d$$

If the displayed scale division (d) is less than the verification scale division (e), then the verification scale division shall be less than or equal to 10 times the displayed scale division.

The value of e must satisfy the relationship, $e = 10^k$ of the unit of measure, where k is a positive or negative whole number or zero. This requirement does not apply to a Class I device with $d < 1$ mg where $e = 1$ mg. If $e \neq d$, the value of “d” shall be a decimal submultiple of “e,” and the ratio shall not be more than 10:1. If $e \neq d$, and both “e” and “d” are continuously displayed during normal operation, then “d” shall be differentiated from “e” by size, shape, color, etc. throughout the range of weights displayed as “d.”

(Added 1999) (Amended 20XX)

S.1.2.2.2. Class I and II Scales Used in Direct Sales. – When accuracy Class I and II scales are used in direct sale applications the value of the displayed division “d” shall be equal to the value of the verification scale interval “e.”

[Nonretroactive as of January 1, 2020; to become retroactive as of January 1, 2023]

(Added 2017)

S.1.2.2.3. Deactivation of a “d” Resolution. – It shall not be possible to deactivate the “d” resolution on a Class I or II scale equipped with a value of “d” that differs from “e” if such action affects the scale’s ability to round digital values to the nearest minimum unit that can be indicated or recorded as required by paragraph G-S.5.2.2. Digital Indication and Representation.

(Added 2018)

S.1.2.2.4. Class III and III Scales. The value of “e” is specified by the manufacturer as marked on the device. Except for dynamic monorail scales, “e” must be less than or equal to “d.”

(Added 1999)

~~S.5.3. S.1.2.2.5.~~ **Multi-Interval and Multiple Range Scales, Division Value.** – On a multi-interval scale ~~and~~ or a multiple range scale, the value of “e” shall be equal to the value of “d.”

(Added 1986) (Amended 1995 and 20XX)

S.1.2.2.6. Class IIIL Scales. On Class IIIL scales the value of “e” shall equal the value of “d.”
(Added 20XX)

(Add new definition)

auxiliary indicating device. – a means to increase the display resolution of a weighing device, such as a rider or vernier on an analog device, or a differentiated least significant digit to the right of the decimal point on a digital device. [2.20]

(Added 20XX)

Section S.1.2.2. is a key part of understanding application of e and d. The first change was to make references uniform to verification scale “division” as used in all other parts of the code. This section currently uses the term verification scale “interval”. Several additions of the term “scale” were also added to S.1.2.2.1. for clarity. Of note, R76 exempts Class I from the e not greater than 10 d requirement when e = 1 mg or less.

A major addition is the new text and table in T.1.2.2. This would create a parallel section in HB44 to R76 section 3.1.2 and Table 2. This section describes four types of instruments:

1. Graduated without an auxiliary indicating device – most instruments e = d
2. Graduated with an auxiliary indicating device – Class I and II with high resolution e > d
3. Graduated & marked for special applications – weight classifiers (round down instruments) e < d
4. Ungraduated – equal arm balances where graduations don’t refer to fixed weight quantities. No d

These four types also impact application of minimum load in Table 8.

The current S.5.3. was moved to this section as S.1.2.2.5. to keep these paragraphs dealing with the magnitude of e and d together. A new paragraph S.1.2.2.6. was added to address Class IIIL where e should always equal d. Now all classes (I, II, III, IIIL, and IIIL) are covered in S.1.2.2. to clarify relative magnitude of e and d.

The addition of the definition rounds out the expansion of this section

S.5.4. S.5.3. Relationship of Minimum Load Cell Verification Interval Value to the Verification Scale Division. – The relationship of the value for the minimum load cell verification scale interval, v_{min} , to the verification scale division, d , for a specific scale using National Type Evaluation Program (NTEP) certified load cells shall comply with the following formulae where N is the number of load cells in a single independent¹ weighing/load-receiving element (such as hopper, railroad track, or vehicle scale weighing/load-receiving elements):

(a) $v_{min} \leq \frac{d * e}{\sqrt{N}}$ for scales without lever systems; and

(b) $v_{min} \leq \frac{d * e}{\sqrt{N} \times (\text{scale multiple})}$ for scales with lever systems.

~~[*When the value of the scale division, d, is different from the verification scale division, e, for the scale, the value of e must be used in the formulae above.]~~

This requirement does not apply to complete weighing/load-receiving elements or scales, which satisfy all the following criteria:

- the complete weighing/load-receiving element or scale has been evaluated for compliance with T.N.8.1. Temperature under the NTEP;
- the complete weighing/load-receiving element or scale has received an NTEP Certificate of Conformance; and
- the complete weighing/load-receiving element or scale is equipped with an automatic

zero-tracking mechanism which cannot be made inoperative in the normal weighing mode. (A test mode which permits the disabling of the automatic zero-tracking mechanism is permissible, provided the scale cannot function normally while in this mode.

[Nonretroactive as of January 1, 1994]

(Added 1993) (Amended 1996, ~~and~~ 2016, ~~and~~ 20XX)

The renumbering resulted from the move of S.5.3. to the S.1.2.2. section as S.1.2.2.5. The other changes correctly reference e instead of d in this section. Technically, v_{min} for load cells corresponds to verification scale division e for weighing instruments. They are accuracy ratings declared by the manufacturer. There is no significant change for the inspector in properly referring to e since for scales where e = d the issue is moot and when e ≠ d the section already directed the use of e. With the change the inspector will always use e.

Group 3. Changes to clarify appropriate application of tolerances (Marked Scales)

Table 6. Maintenance Tolerances (All values in this table are in <u>verification</u> scale divisions “e”)				
Tolerance in Scale Divisions				
	1	2	3	5
Class	Test Load			
I	0 - 50 000	50 001 - 200 000	200 001 +	
II	0 - 5 000	5 001 - 20 000	20 001 +	
III	0 - 500	501 - 2 000	2 001 - 4 000	4 001 +
IIIL	0 - 50	51 - 200	201 - 400	401 +
III L	0 - 500	501 - 1 000	(Add 1 d e for each additional 500 d e or fraction thereof)	

The proper reference in this section has always been e, and this is how it has always been interpreted. The current language says “scale divisions” which technically refers to d. This means we weren’t following the Code. The removal of “in Scale Divisions” after Tolerances in the second row was made to provide parallel construction with the header for Test Load. The parenthetical at the top should be sufficient to cover both sections of the table.

The change for Class IIIL was made since e should be used to specify tolerances and we added S.1.2.2.6. requiring that d = e for this class.

T.N.3.4. Crane and Hopper (Other than Grain Hopper) Scales. – The maintenance and acceptance tolerances shall be as specified in T.N.3.1. Maintenance Tolerance Values and T.N.3.2. Acceptance Tolerance Values for Class IIIL, except that the tolerance for crane and construction materials hopper scales shall not be less than 1 ~~e~~ or 0.1 % of the scale capacity, whichever is less.

(Amended 1986 ~~and~~ 20XX)

T.N.4.3. Single Indicating Element/Multiple Indications. – In the case of an analog indicating element equipped with two or more indicating means within the same element, the difference in the weight indications for any load other than zero shall not be greater than one-half the value of the verification scale division (~~e~~) and be within tolerance limits.

(Amended 1986)

The reference to tolerances in T.N.3.4. and T.N.4.3. should follow the principle of expressing tolerances in e.

Group 4. Changes to clarify appropriate application of tolerances (Unmarked Scales)

T.1. General. – The tolerances applicable to devices not marked with an accuracy class shall have the tolerances applied as specified in Table T.1.1. Tolerances for Unmarked Scales.

Note: When Table T.1.1. refers to T.N. sections it shall be accepted that the scale division d on the unmarked scale always equals the verification scale division e.
(Amended 20XX)

Prior to 1984, tolerances were based on percentage of load for most scales. There was no concept of verification scale division e. In the T.N. section all tolerances are expressed in e. The note is added to clarify that d for the T. section is always equal to e from the T.N. section.

The workgroup noted that several specific paragraphs in the T. section for unmarked scales refer to tolerances in terms of d. Those sections are shown below. With the addition of the note to T.1. General, it was decided that it was not appropriate or necessary to change the d to e in these paragraphs.

T.2.2. General. – Except for scales specified in paragraphs T.2.3. Prescription Scales through T.2.8. Railway Track Scales: 2 d, 0.2 % of the scale capacity, or 40 lb, whichever is least.

T.2.4.2. With More Than One-Half Ounce Capacity. – 1 d or 0.05 % of the scale capacity, whichever is less.

T.2.7. Vehicle, Axle-Load, Livestock, and Animal Scales.

T.2.7.1. Equipped With Balance Indicators. – 1 d.

T.2.7.2. Not Equipped With Balance Indicators. – 2 d or 0.2 % of the scale capacity, whichever is less.

T.2.8. Railway Track Scales. – 3 d or 100 lb, whichever is less.

Group 5. Changes to clarify appropriate scale selection (reference Table 8)

Table 8. Recommended Minimum Load		
Class	Value of <u>Verification Scale Division “e”</u> (d or e*)	<u>Recommended Minimum Load in</u> <u>scale divisions “d” (See notes) (d or</u> <u>e*)</u>
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
IIIH	All	10
<p>*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 “e” is the value of the scale division immediately preceding the auxiliary means. For Class III and IIIH devices the value of “e” is specified by the manufacturer as marked on the device; “e” must be less than or equal to “d.”</p> <p><u>The displayed scale division d is not always equal to the verification scale division e. To ensure the correct values are used, refer to required markings on the device (see also notes 3 and 4 in Table S.6.3.b.).</u></p> <p><u>For an ungraduated device, the scale division d shall be replaced with the verification scale division e in the last column.</u></p> <p>**A minimum load of 40 d 5 e is recommended for a weight classifier marked in accordance with a statement identifying its use for special applications.</p>		

In the header, the change in column 2 references e and the change in column 3 references d and directs you to the notes. Currently, the Code references (d or e) in both columns which causes confusion. We're never sure which one to use. The justification for d in the last column follows below.

It is vital to understand that Table 8. is tied closely to Table 3. You will find that header to the first two columns in both tables, with these changes, will be identical. The workgroup also revised the * note to remove the * and use parallel text to revised note 1 of Table 3. The notes section contains two special exceptions to the general values in column 3 the table. The first directs you to use e in the last column for ungraduated instruments, as these have no d values. The second directs you to use a minimum load of 5 e for weight classifiers. This aligns the value with R76. Note that the use of d for weight classifiers leads to unusual situations. Two weight classifiers with 100 lb capacity and e of 0.05 lb should have the same minimum load. However, they might have very different d values, say 1 lb and 0.2 lb. Declaring minimum load as 10 d for these result in very large differences of 10 lb minimum load for the first instrument and 2 lb for the second. Since $e < d$ for weight classifiers, the minimum load is correctly expressed in e.

Understanding Minimum Load

In R76, minimum load “Min” is included in the principles of classification, see 2.2. below. There are 4 mandatory markings; Class, Max, Min and e. When R76 was translated into HB44 a conscious decision was made to remove Min from the classification and make it a user requirement. Thus, HB44 only has 3 mandatory markings; Class, Capacity, and d. We have already proposed to change the d to e above.

2.2 Principles of the metrological requirements

The requirements apply to all instruments irrespective of their principles of measurement.

Instruments are classified according to:

- the verification scale interval, representing absolute accuracy; and
- the number of verification scale intervals, representing relative accuracy.

The maximum permissible errors are in the order of magnitude of the verification scale interval. They apply to gross loads and when a tare device is in operation they apply to the net loads. The maximum permissible errors do not apply to calculated net values when a preset tare device is in operation.

A minimum capacity (Min) is specified to indicate that use of the instrument below this value is likely to give rise to considerable relative errors.

In R76, the issue of instrument accuracy is focused on Class, Max and e, parallel to HB44. Absolute accuracy in terms of e and relative accuracy in terms of n. When the load is very small, i.e. less than Min, it might appear that R76 is addressing the large relative errors resulting in 1 e tolerance for some small number of e in load. However, this is not the case. The distinction is that Min applies to use of the instrument and not to testing of the instrument.

In testing under R76 tolerances, rounding errors are eliminated (see 3.5.3.2.). In practice this usually means error weights are used to resolve the instrument errors to at least 0.2 e (NTEP generally uses 0.1 e). In addition, R76 expects that instrument divisions are relatively uniform throughout the series. In order to get a +1 e error at 1 e load and still meet the requirement that the zero division be +/- 0.5 division wide, would require the 1 e divisions be 0 e wide (i.e. be skipped). To visualize in analog, imagine an indicator that starts at zero and jumps immediately to the 2 graduation. A load of 1 e would indicate 2 e. Likewise a load of 2 e would indicate 3 e and this pattern would repeat until the tolerance breakpoint, a load of 500 e would indicate 501 e. Then the second graduation after the break point would be skipped, i.e. the 502 e graduation. A load of 501 e would indicate 503 e with a +2 e error. All the loads up to 20,000 e would now show a +2 e error. Instruments obviously should not, and DO NOT, operate that way.

If we assume instrument divisions are uniform, as R76 does, then the divisions should be accurate to about the relative % of the accuracy class. For Class II in the first step this is 0.02%. Thus at 20 e load the maximum expected error (after eliminating rounding) should be in the order of 0.004 e, and not the 1 e permitted in the tolerance structure. So, what relative error can R76 be addressing when dealing with Min?

When an instrument is used in commerce, it is the rounding of the indication to $\frac{1}{2}$ scale division that results in large relative errors. Consider a cannabis sale of 1.05 g when the division size is 0.1 g. The instrument must round off to either 1.0 g or 1.1 g. Either one produces an error in the weighment of 0.05 g. That's 4.8% relative error in the weighment ($0.05 \text{ g} / 1.05 \text{ g}$) with an instrument that's supposed to be accurate to 0.02%. It is this rounding error "in use" that produces the large relative errors addressed in Min in R76 and the minimum load in HB44. This rounding error is a function of d , the displayed scale division, and not e . It is not a tolerance issue.

The confusion comes from the presentation of Min in terms of e in the last column of R76 Table 3. The table in R76 has an additional column for Min not found in HB44. In HB44 it has been relocated to Table 8. Looking closely at Table 8, you will find that the first two columns correspond to the first two columns in Table 3 in HB44. So why does R76 express this column in e instead of d ? I suspect they did it because all other values in Table 3 are in e . For instruments where $e = d$, the issue is moot. Note however, that R76 reveals the ties to d for the Class I and II instruments with an auxiliary indicating device (differentiated least significant digit). In 3.4.3. R76 directs that d replace e in the Min column of Table 3 for instruments with an auxiliary indicating device.

On an instrument where $e = 10 d$, we can create the same scenario as before but now with a load of 1.005 g. The instrument must now round to either 1.00 g or 1.01 g. The rounding error is now 0.50% of the weighment ($0.005 / 1.005$). That is 10 times smaller at the same $20 e$ load.

Returning to the four types of instruments from revised S.1.2.2. and applying revised Table 8.:

- | | |
|--|---------------------|
| 1. Graduated without an auxiliary indicating device: | minimum load in d |
| 2. Graduated with an auxiliary indicating device: | minimum load in d |
| 3. Graduated and marked for special use (weight classifier): | minimum load $5 e$ |
| 4. Ungraduated (equal arm scales): | minimum load in e |

Group 6. Changes to correctly reference to e or d as appropriate.

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 verification scale division.

*(b) A digital indicating device shall either automatically maintain a "center-of-zero" condition to $\pm \frac{1}{4}$ verification scale division or less, or have an auxiliary or supplemental "center-of-zero" indicator that defines a zero-balance condition to $\pm \frac{1}{4}$ of a verification scale division or less. A "center-of-zero" indication may operate when zero is indicated for gross and/or net mode(s).
[Nonretroactive as of January 1, 1993]*

(c) For electronic cash registers (ECRs) and point-of-sale systems (POS systems) the display of measurement units shall be a minimum of 9.5 mm (3/8 inch) in height.

[Nonretroactive as of January 1, 2021]

(Added 2019)

(Amended 1992, 2008, ~~and~~ 2019, and 20XX)

The changes correctly reference e in this section as this is an issue of ensuring the zero indication is accurate to $\frac{1}{4} e$. Hence it is a tolerance properly expressed in terms of e .

T.N.9. 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 one verification scale division ~~(d)~~ (e); or the equipment shall:

- (a) blank the indication; or
- (b) provide an error message; or

- (c) the indication shall be so completely unstable that it cannot be interpreted, or transmitted into memory or to a recording element, as a correct measurement value.

The tolerance in T.N.9. Radio Frequency Interference (RFI) and Other Electromagnetic Interference Susceptibility is to be applied independently of other tolerances. For example, if indications are at allowable basic tolerance error limits when the disturbance occurs, then it is acceptable for the indication to exceed the applicable basic tolerances during the disturbance.

(Amended 1997 and 20XX)

This is a tolerance for reaction to a disturbance and is properly expressed in e.

Group 7. Identify appropriate application of code sections (in order of appearance)

When the paragraph references d it is referring to the actual scale division and the concern is how the instrument operates. When the paragraph references e it is referring to the verification scale division and the concern is in classification of the instrument or in accuracy of the displayed values.

The sections in the table below currently correctly reference e or d as appropriate. The text of each section is not included for brevity. The justification may help explain the general rules above.

Code Section	Applies to	Justification
G-S.5.2.2.(c)	d	Rounding is a function of instrument operation not accuracy
G-S.5.2.2.(d)	d	Requires “d” to be an indicated zero and all digits to the left of “d” to be zero when $d < 1$. Requires “d” to be an indicated zero and all digits to the right of “d” to be zero when $d > 5$.
S.1.2.	d	1, 2, or 5 refers to d which is rounded. When $e \neq d$ refer to section S.1.2.2. for value of e.
S.1.2.1	d	Refers to rounded values of d.
S.1.2.3.	e	This is a classification issue. It ensures accuracy of the piece counts.
S.1.7.(b)	e	This is a classification issue addressing maximum indication above capacity.
S.2.1.2.	d	They must be in terms of d since stability of zero setting applies to d.
S.2.1.3.(all)	d	These limit the window for action of AZT. They must be in terms of d since zero setting applies to d.
S.2.3.	d	Tare division must equal smallest increment displayed.
T.N.7.	d	Discrimination requires an instrument to discriminate to the displayed scale division (zone of uncertainty). This relates to the rounding of the smallest increment.
UR.3.7.	d	Minimum load is correctly expressed in d. (see Group 5 above)
UR.3.10.	e	As written, this is clearly e. (See issues for additional study)

PART 3. Issues Identified as Requiring Additional Study (outside the scope of this workgroup)

A. The workgroup was in consensus that we should expand requirements in S.2.1.2. relating to semi-automatic zero to apply to all scales and not just scales used in direct sale. In first place, suitability is a User Requirement and not a specification. Second, correct operation to set zero should be applicable to all digital instruments as it is in R76.

B. The application of tolerances to net loads has always been assumed, even before the Scales Code adoption in 1984. Comparing T.2. for unmarked scales and T.N.2.1. for marked scales reveals important differences particularly regarding net loads. As written, T.N.2.1. exempts calculated net, but it appears to apply to both semi-automatic tare and preset tare. A comparison to R76 shows that OIML limits applicability of tolerances. Their MPE's do not apply to calculated net values or when preset tare (keyboard or programmed tare) is in operation (section 2.2). It appears net loads have MPE's applied only when the net zero is set in compliance with S.1.1.1.(b) which requires accuracy of zero to $\frac{1}{4}$ division.

This cannot be assured with preset tare or when net is based on two gross values. This has further ramifications to any case where all three (gross, tare and net) values are indicated/recorded for a transaction. OIML requires the gross and net weights be accurate but does not apparently require that the equation gross – tare = net be in mathematical agreement due to rounding issues. Note that in most transactions, the customer only gets one or two of the gross, tare or net values. Rounding issues do not arise for this reason. This may impact a current issue before NCWM dealing with printing tare on POS transaction receipts. Consider a POS transaction where the customer saw 1.02 lb on the weight display and sees 1.00 lb net and 0.03 lb tare. These are all accurate weights (and correct per R76) but the numbers don't add up. The customer will claim they were overcharged by 0.01 lb since $1.02 \text{ lb} - 0.03 \text{ lb} = 0.99 \text{ lb}$.

C. The resolution of errors in testing scales was identified as an issue. The original proposal included a revision requiring resolution of error to at least 0.2 e. R76 specifically declares that errors be resolved to at least 0.2 e to eliminate rounding error. HB44 has no such provision and it might appear that rounding error is included in the tolerance. Instead of tolerance steps of 1, 2, etc., it could be argued that the tolerances are 1.5, 2.5, etc. as the result of direct reading. NTEP uses the R76 approach exclusively in testing, but it has no technical basis in the Code. There are obvious issues involved in using error weights in the field. The challenge is that you either eliminate rounding in determining tolerances or you don't. We have two standards at play at present. In addition, it can be argued that Class IIIL instruments are already high resolution somewhat similar to Class I and II instrument with $e > d$. Class IIIL devices have enough resolution to read errors to 0.2 e or 0.1 e of the equivalent Class III instrument without using error weight.

D. The UR.3.10. requirement that transactions from dynamic monorail scales be based on e raises issues. It was discussed since it involves both e and d. The displayed scale divisions equal to e (i.e. 10 d) are not normally rounded. If $e = 10 d$ then the rounding point is not 5 up/4 down, as it is for d, but rather 9.5 up/0.5 down. Does this requirement mean the scale design has to produce a properly rounded value for the transaction that may be different from the display, e.g. 943.7 lb to d of 0.1 lb now must be recorded for the transaction as 944 lb? In addition, in brief discussion, it seemed there were many ways this could be interpreted. The workgroup concluded it would be beneficial to open some discussions with USDA and the manufacturers to explore some of these questions. This also addresses similar issues to the proposal to delete S.1.2.2.2. where questions of using e or d are impacting high precision scales in cannabis and jeweler's sales.

APPENDIX B

~~CURRENT CODE DELETION;~~ **REVISED AMENDMENT UNTIL JUL. 2023; ADDITIONAL
AMENDMENT FOR AUG. 2023;**

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SECTION 2.25. WEIGH-IN-MOTION SYSTEMS USED FOR VEHICLE ENFORCEMENT ~~SCREENING~~ – TENTATIVE CODE FOR VEHICLE SCREENING AND CODE FOR DIRECT ENFORCEMENT

This tentative code **for vehicle screening (Class A)** 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 2015)

The Class E systems used for direct enforcement shall follow this code.

A. APPLICATION

A.1. General . – This code applies to **fixed (not portable)** systems used to weigh vehicles, while in motion, for the purpose of screening and sorting the vehicles based on the vehicle weight to determine if a static weighment is necessary **(Class A) and direct enforcement of the weight limit of vehicles (Class E).**

A.2. Exception. – This code does not apply to weighing systems intended for the collection of statistical traffic data.

A.3. Additional Code Requirements. – In addition to the requirements of this code, weigh-in-motion screening 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:

(b) 1, 2, or 5; or

(c) 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” for a Class A and Class E, ~~weight-in-motion~~ weigh-in-motion (WIM) system shall not be greater than 50 kg (100 lb).

S.1.3.1. Number of Scale Division. – The number of scale divisions for Class E shall be a minimum of 200 and a maximum of 4,000.

S.1.3.2. Minimum Capacity. – The minimum capacity in scale division for Class E shall be 10.

S.1.4. Value of Other Units of Measure.

S.1.4.1. Speed. – Vehicle speeds shall be measured in miles per hour or kilometers per hour.

S.1.4.2. Axle-Spacing (Length). – The center-to-center distance between any two successive axles shall be measured in:

(a) meters and decimal submultiples of a meter;

(b) feet and inches; or

(c) feet and decimal submultiples of a foot.

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

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

S.1.6. Identification of a Fault. – Fault conditions that may affect the tolerance of accuracy as specified in Table T.2.2 Tolerances for Accuracy shall be presented to the operator in a clear and unambiguous means. The following fault conditions are recommended to ~~shall~~ be identified:

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

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

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

- (e) Imbalanced weight between the left and right wheels has exceeded the specified values.
- (f) Vehicle has changed lanes between or in the proximity of the first and the last sensors.
- (g) Any axle or wheel is not on the load-receiving element of the sensors.
- (h) Vehicle direction of travel is not valid for the installation.
- (i) The amount of time all vehicle axles are simultaneously on the scale is below the minimum data acquisition time per manufacturer.

S.1.7. Recorded Representations.

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

(a) transaction identification number;

(b) station ID;

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

~~(c)~~(d) vehicle speed;

~~(d)~~(e) number of axles;

~~(e)~~(f) weight of each axle;

~~(f)~~(g) identification and weight of axle groups;

~~(g)~~(h) axle spacing;

~~(h)~~(i) total vehicle weight;

(j) total vehicle length;

~~(i)~~(k) all fault conditions that occurred during the weighing of the vehicle, **as identified in paragraph S.1.6. Identification of a Fault;**

~~(j)~~(l) violations, as identified in paragraph S.2.1. Violation Parameters, which occurred during the weighing of the vehicle; and

~~(k)~~(m) time and date.

Note: For Class E, 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:

- (e) single axle weight limit;
- (f) axle group weight limit;
- (g) gross vehicle weight limit; and
- (h) 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, Accuracy Class.

S.4.1. Designation of Accuracy. – Weigh-in-motion systems meeting the requirements of this code shall be designated as accuracy Class A ~~and Class E~~.

Note: This does not preclude higher accuracy classes from being proposed and added to this Code in the future when it can be demonstrated that weigh-in-motion systems grouped within those accuracy classes can achieve the higher level of accuracy specified for those devices.

S.5. Design of Temperature.

S.5.1. Operating Temperature. – The operating temperature limit shall be from -10°C (14°F) to +40°C (104°F).

S.5.2. Temperature Effect on No-Load Balance. – The zero-load indication shall not vary by more than one division per 5°C (9°F) change in temperature.

S.6. Design of Electric Power Supply.

S.6.1. Power Supply, Voltage and Frequency.

- (a) AC main power: Weighing devices shall comply with Table T.2.2 Tolerances for Accuracy when tested over the range 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.**
- (b) DC main power (including rechargeable or non-rechargeable batteries): Weighing devices shall not indicate nor record values outside the applicable tolerance limits set forth in Table T.2.2 Tolerances for Accuracy when the battery power output is excessive or deficient.**

S.6.2. Power Interruption. – A power interruption shall not cause an indicating or recording element to display or record any values outside the applicable tolerance limits.

S.7. Design of Balance for Class E.

S.7.1. Zero-Load Adjustment.

- (a) An automatic zero adjustment outside the limits in S.7.1.(b) is prohibited.**
- (b) The maximum load that can be “re-zeroed” during normal operating conditions shall be 3.0 scale divisions.**

S.7.2. Zero-Tracking Device for Class E. – A zero-tracking device shall operate only when:

- (d) the indication is at zero;**
- (e) the instrument is in stable equilibrium;**
- (f) the corrections are not more than 0.5d per second; and**
- (g) within a range of 4% of Max around the actual zero.**

S.7.3. Totalizing Device. – WIM instruments may be provided with a totalizing device which operates:

- (h) automatically, in which case the instrument shall be provided with a vehicle recognition device defined in S.7.4. Vehicle Recognition/Presence Device; or**
- (a) semi-automatically (e.g., it operates automatically following a manual command).**

S.7.4. Vehicle Recognition/Presence Device for Class E – WIM instruments which are able to operate without the intervention of an operator shall be provided with a vehicle recognition device. The device shall detect the presence of a vehicle in the weigh zone and shall detect when the whole vehicle has been weighed. WIM instruments shall not indicate or print the vehicle mass unless all of the wheels of the vehicle have been weighed.

Note: S.7.1 and S.7.2 may not be applicable to all devices.

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

S.5.9. Marking Requirements. – In addition to the marking requirements in G-S.1. Identification (except G.S.1.(e)), the system shall be marked with the following information:

- (a) accuracy class;
- (b) value of the system division “d”;
- (c) operational temperature limits;
- (d) number of instrumented lanes (not required if only one lane is instrumented);
- (e) minimum and maximum vehicle speed;
- (f) maximum number of axles per vehicle;
- (g) maximum change in vehicle speed during weighment; and
- (h) minimum and maximum load.

S.5.9.1. Location of Marking Information. – The marking information required in Section 1.10. General Code, G-S.1. Identification and Section 2.25. Weigh-in-Motion Systems, S.5. Marking Requirements shall be visible after installation. The information shall be marked on the system or recalled from an information screen.

N. NOTES

N.1. Test Procedures.

N.1.1. Selection of Test Vehicles. – All dynamic testing associated with the procedures described in each of the subparagraphs of N.1.5 **and N.1.6** shall be performed with a minimum of ~~two~~ the following test vehicles for Class A and Class E, respectively.

N.1.1.1. Selection of Test Vehicles for Class A. – A minimum of two vehicles below shall be used.

- (a) The first test vehicle may be a two-axle, six-tire, single-unit truck; that is, a vehicle with two axles with the rear axle having dual wheels. The vehicle shall have a maximum gross vehicle weight of 10 000 lb.
- (b) The second test vehicle shall be a five-axle, single-trailer truck with a maximum gross vehicle weight of 80 000 lb.

N.1.1.2. Selection of Test Vehicles for Class E. – A minimum of three vehicles below shall be used.

- (e) The first test vehicle may be a two-axle, six-tire, single-unit truck or Federal Highway Administration (FHWA) Class 5; that is, a vehicle with two axles with the rear axle having dual wheels
- (f) The second test vehicle shall be a five-axle, single-trailer truck or FHWA Class 9 3S2 Type.
- (g) The third test vehicle shall be a three-axle, single-unit truck or FHWA Class 6.
- (h) The gross vehicle weights shall be as stated in N.1.2.3. *Dynamic Test Loads for Class E.*

Note 1: Consideration should be made for testing the systems using vehicles which are typical to the system's ~~daily operation~~ target vehicles.

Note 2: Vehicles with liquid loads should be excluded from the testing and from enforcement.

N.1.1.3. Weighing of Test Vehicles. – All test vehicles shall be weighed on a reference scale, meeting the requirements of Appendix A, before being used to conduct the dynamic tests.

N.1.1.4. Determining Reference Weights for Axle, 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 for Class A. – Test vehicles used for dynamic testing shall be loaded to 85 % to 95 % of their legal maximum Gross Vehicle Weight for a minimum of 20 runs per test vehicle type. The “load” shall be non-shifting and shall be positioned to present as close as possible, an equal side-to-side load.

N.1.2.3. Dynamic Test Loads for Class E. – Test vehicles used for dynamic testing shall be loaded in two (2) different load conditions. The “load” shall be non-shifting and shall be positioned to present as close as possible, an equal side-to-side load.

- (d) 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; and
- (e) a full load condition (> 85% of the legal load limit for the test vehicle) for a minimum of 20 runs per test vehicle type

N.1.3. Reference Scale. – Each reference vehicle shall be weighed statically on a multiple platform vehicle scale or a single-platform vehicle scale

N.1.3.1. Multi-Platform Vehicle Scale. – It is comprised of three individual weighing/load-receiving elements, each an independent scale. 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;

- (c) the simultaneous weighing of each single axle and axle group of the reference test vehicles on different individual elements of the scale; and
- (d) 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. Single-Platform Vehicle Scale. – *Each individual axle or axle group of the reference test vehicles shall be measured on the single platform vehicle 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 GVW shall be determined by summing all the single axles and axle groups.*

The scale shall be tested immediately prior to using it to establish reference test loads and in no case more than ~~24 hours~~ **4 weeks** prior. To qualify for use as a suitable reference scale, it must meet NIST Handbook 44, Class III L maintenance tolerances.

N.1.3.1. Location of a Reference Scale. – The location of the reference scale must be considered since vehicle weights will change due to fuel consumption.

N.1.4. Test Speeds. – All dynamic tests shall be conducted **at the designated speed(s).**

N.1.4.1. Test Speeds for Class A. – *Speed shall be within 20% below or at the posted speed limit.*

N.1.4.2. Test Speeds for Class E. – *Two speeds shall be used.*

- (a) **at a high speed – posted speed limit (Vmax); and**
- (b) **at a low speed – site-specific minimum speed, not below manufacturer's requirement (Vmin).**

N.1.5. Test Procedures **for Class A.**

N.1.5.1. Dynamic Load Test. – The dynamic test shall be conducted using the test vehicles defined in N.1.1.1. Selection of Test Vehicles. The test shall consist of a minimum of 20 runs for each test vehicle at the speed as stated in N.1.4.1. Test Speeds.

At the conclusion of the dynamic test, there will be a minimum of 20 weight readings for each single axle, axle group, and gross vehicle weight of ~~the each~~ test vehicle. The tolerance for each weight reading shall be based on the percentage values specified in Table T.2.2 Tolerances for Accuracy ~~Class A.~~

N.1.5.2. Vehicle Position Test. – During the conduct of the dynamic testing, ensure the vehicle stays within the defined roadway along the width of the sensor. The test shall be conducted with 10 runs with the vehicle centered along the width of the sensor; 5 runs with the vehicle on the right side along the width of the sensor; and 5 runs with the vehicle on the left side along the width of the sensor. Only gross vehicle weight is used for this test and the tolerance for each weighment shall be based on the tolerance value specified in T.2.3. Tolerance Value for Vehicle Position Test.

N.1.5.3. 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.

N.1.6. Test Procedures for Class E.

N.1.6.1. Dynamic Load Test. – The dynamic test shall be conducted using the test vehicles defined in N.1.1.2. Selection of Test Vehicles for Class E. The test shall consist of a minimum of 30 runs for each test vehicle. A minimum of 10 runs at half load condition and a minimum of 20 runs at full load condition.

At the conclusion of the dynamic test, there will be a minimum of 30 weight readings or 15 weight readings at each speed. The tolerance for each weight reading shall be based on the percentage values specified in Table T.2.2 Tolerances for Accuracy at 100% compliance.

- (a) **a half load condition.** – The test shall be conducted with 10 runs in total or 5 runs at each speed as stated in N.1.4.2. Test Speeds for Class E along the width of the sensor.
- (b) **a full load condition.** – The test shall be conducted with 20 runs in total or 10 runs at each speed as stated in N.1.4.2. Test Speeds for Class E along the width of the sensor.

See Table N.1.6 below to summarize the minimum number of test runs for Class E.

<u>Table N.1.6</u>	
<u>Minimum Number of Test Runs per Each Test Vehicle for Class E</u>	
<u>Load Condition</u>	<u>Speed</u>
<u>Half Load (10 runs)</u>	<u>High Speed V_{max} (5 runs)</u>
	<u>Low Speed V_{min} (5 runs)</u>
<u>Full Load (20 runs)</u>	<u>High Speed V_{max} (10 runs)</u>
	<u>Low Speed V_{min} (10 runs)</u>
<u>30 runs</u>	<u>15 runs x 2 speeds</u>

N.1.6.2. Vehicle Position Test. – During the conduct of the dynamic testing for Class E, ensure the vehicle stays within the defined roadway and load receiving element of the sensor. No position test shall be performed for Class E because of the natural behavior of the test truck drivers.

N.1.6.3. 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.

N.1.6.4. Reference Axle Spacing. – Before measuring the reference axle spacing, the test vehicle shall be positioned straight, and the driving axle shall also be straight. A steel tape measure shall be used to determine the reference axle spacing. 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.1.6.5 Test of Operating Speed Interlock. – To test the functioning of the operating speed interlock, test runs with one of the reference vehicles shall be made at speeds outside the range of operating speeds:

(a) at a speed of at least 5 % in excess of the maximum operating speed, OPVmax; and

(b) at a speed of at least 5 % below the minimum operating speed, OPVmin (if applicable).

The instrument shall detect the above conditions and not indicate or print any mass or load values unless there is a clear warning message on the indication and/or the printout.

N.1.6.6 Test of Operating Speed. – To determine and test the operating speed during an in-motion test, conduct six test runs of the unloaded two-axle rigid reference vehicle over the lateral center of the load receptor at constant speed. Three runs shall be near maximum operating speed, OPVmax, and three additional runs shall be just above minimum operating speed, OPVmin.

The reference value (conventional true value) for speed to be used in calculating the error in the indicated operating speed for each test run shall be the quotient of the measured axle spacing (to the nearest 10 mm) of the static two-axle rigid reference vehicle divided by the measured time interval (to the nearest millisecond) between arrival at a defined location (e.g., the leading edge) on the load receptor by the front and the rear axle of the moving two-axle rigid reference vehicle. No error in the indicated operating speed shall exceed 3 mph.

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 for Accuracy Class A and Class E.

T.2.1. Tests Involving Digital Indications or Representations. – To the tolerances that would otherwise be applied in paragraphs T.2.2. Tolerance Value for Dynamic Load Test and T.2.3. Tolerance Value for Vehicle Position Test, there shall be added an amount equal to one-half the value of the scale division to account for the uncertainty of digital rounding.

T.2.2. Tolerance Values for Dynamic Load Test. – The tolerance values applicable during dynamic load testing are as specified in Table T.2.2 for vehicle screening as well as direct enforcement purposes.

Table T.2.2. Tolerances for Accuracy Class A	
Load Description*	Tolerance as a Percentage of Applied Test Load
Axle Load	± 20 %
Axle Group Load <u>(including bridge formula)</u>	± 15 %
Gross Vehicle Weight	± 10 %
<p>* <u>Class A for Vehicle Screening Purposes:</u> No more than 5 % of the weighments in each of the load description subgroups shown in this table shall exceed the applicable tolerance.</p> <p>* <u>Class E for Direct Enforcement Purposes: All weighments shall be 100% compliance. Any weighments with any fault as identified in paragraph S.1.6 Identification of a Fault shall not be included in determining tolerances for accuracy.</u></p>	

T.2.3. Tolerance Value for Vehicle Position Test for Class A. – The tolerance value applied to each gross vehicle weighment is ± 10 % of the applied test load.

T.2.4. Tolerance Value for Axle Spacing. – The tolerance value applied to each axle spacing measurement shall be ± 0.15 m (~~0.5 ft~~ 6 inches) at 100% compliance.

T.3. Influence Factors. – The following factor is applicable to tests conducted under controlled conditions only.

T.3.1. Temperature. – Systems shall satisfy the tolerance requirements under all operating temperature unless a limited operating temperature range is specified by the manufacturer.

T.3.2. Power Supply. – System shall satisfy the tolerance requirements 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 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.2.2. Tolerances for Accuracy Class A.

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 scale divisions, value of the scale division, or verification scale division and minimum capacity.

UR.1.1. General. – The typical class or type of device for particular weighing applications is shown in Table 1. Typical Class or Type of Device for Weighing Applications.

Table 1. Typical Class or Type of Device for Weighing Applications	
Class	Weighing Application
A	Screening and sorting of vehicles based on axle, axle group, and gross vehicle weight.
<u>E</u>	<u>Enforcing of vehicles based on axle, axle group, and gross vehicle weight.</u>
Note: A WIM system with a higher accuracy class than that specified as “typical” may be used.	

UR.2. User Location Conditions and Maintenance. – The system shall be installed and maintained as defined in the manufacturer’s recommendation.

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 scale 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.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 user shall consult the specific jurisdictional legislation and/or protocol for additional values that may be required. 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.**

APPENDIX D. DEFINITIONS

The specific code to which the definition applies is shown in the [brackets] at the end of the definition. Definitions for the General Code [1.10] apply to all codes in NIST Handbook 44.

A

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. [2.25]

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. [2.25]

axle load. – The sum of all tire loads of the wheels on an axle; a portion of the gross-vehicle weight. [2.25]

axle spacing. – The distance between the centers of any two axles. When specifying axle spacing, the axels used also need to be identified. [2.25]

S

single-axle load. – The load transmitted to the road surface by the tires lying on the same longitudinal axis (that axis transverse to the movement of the vehicle and about which the wheels rotate). [2.25]

T

tandem-axle load. – The load transmitted to the road surface by the tires of two single-axles lying on the same longitudinal axis (that axis transverse to the movement of the vehicle and about which the wheels rotate). [2.25]

triple-axle load. – The load transmitted to the road surface by the tires of three single-axles lying on the same longitudinal axis (that axis transverse to the movement of the vehicle and about which the wheels rotate). [2.25]

W

weigh-in-motion (WIM). – A process of estimating 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. [2.25]

weigh-in-motion screening scale. – A weigh-in-motion system used to identify potentially overweight vehicles. [2.25]

wheel weight. – The weight value of any single or set of wheels on one side of a vehicle on a single axle. [2.25]

WIM System. – A set of sensors and supporting instruments that measure the presence of a moving vehicle and the related dynamic tire forces at specified locations with respect to time; estimate 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. [2.25]

S&T 2024 Interim Meeting Agenda

Appendix B – WIM-23.1: 2.26 Weigh-in-Motion Systems Used for Vehicle Direct Enforcement

FORM 15: PROPOSAL TO AMEND HANDBOOK 44, SECTION 2.25

PART 16: PROPOSAL FOR **S&T WIM.23-1**

Submitted by: NYCDOT, C2SMART, MDOT & KISTLER

Handbook 44 – 2020

2.25. Weigh-In-Motion Systems ~~—Tentative Code~~

APPENDIX C

NIST Handbook 44 Device Code Requirements for Non-Utility Electricity-Measuring Systems

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SECTION 3.XX. NON-UTILITY ELECTRICITY-MEASURING SYSTEMS – TENTATIVE CODE

This tentative code has only 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 Non-Utility Electricity-Measuring System (NUEMS) are advised to see paragraph G-A.3. Special and Unclassified Equipment.

(Tentative Code Added 20XX)

NUEMS Acronym and Definition: As used throughout this code, a Non-Utility Electricity-Measuring System or “NUEMS” is defined as an electricity measuring system comprised of all the metrologically relevant components required to measure electrical energy, store the result, and report the result used in non-utility sales of electricity wherein the sale is based in whole or in part on one or more measured quantities.

Safety Note: This code does not specifically discuss Safety. It is essential that all personnel working with the devices covered by this code and associated electrical equipment be properly trained and adhere to all applicable safety standards, regulations, and codes. See also General Code Paragraph G-N.1. Conflict of Laws and Regulations.

A. APPLICATION

A.1. General. – This code applies to measuring systems used in non-utility sales of electric energy wherein the sale is based in whole or in part on one or more measured quantities.

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

- (a) The use of any measuring system owned, maintained, and/or used by a utility.
- (b) Measuring systems used solely for delivering electric energy in connection with operations in which the amount delivered does not affect customer charges or compensation.
- (c) Electric vehicle fueling systems. (See 3.40. Electric Vehicle Fueling Systems Code)
- (d) Transactions not subject to weights and measures authority.

A.3. Additional Code Requirements. – In addition to the requirements of this code, Non-Utility Electricity-Measuring Systems shall meet the requirements of Section 1.10. General Code.

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.

A.5. NUEMS Type Notation. – Code sections and subsections with an [ES] notation apply to External Sensor NUEMS only. Code sections and subsections with a [IS] notation apply to Internal Sensor NUEMS only. Code sections and subsections without [ES] or [IS] notation apply to both NUEMS types.

S. SPECIFICATIONS

S.1. Indicating and Recording Elements.

S.1.1. Units. – Units for any indicated or recorded measurements shall be as follows:

Active Energy: kilowatt-hours (kWh)

S.1.1.1. Numerical Value of Quantity-Value Divisions. – The value of an increment shall be equal to a decimal multiple or submultiple of 1.

Examples: quantity-value divisions may be 10; or 0.01; or 0.1; etc.

S.1.1.2. Digital Indications. – An indication shall include the display of a number for all places that are displayed to the right of the decimal point and at least one place to the left. Otherwise, leading zeros are not required.

S.1.2. Nominal Capacity. – *A device shall have a minimum capacity indication of five digits of resolution.*

[Nonretroactive as of January 1, 20XX]

S.1.3. NUEMS Indications.

S.1.3.1. Primary Indicating Element. – Each NUEMS shall be equipped with a primary indicating element that includes a display visible and accessible after installation which clearly indicates the number of kilowatt-hours measured by the NUEMS.

S.1.3.2. Test Output. – A NUEMS shall have either: (1) a rotating disk indicator; (2) a pulse output (visible or infrared), or (3) an electrical pulse (in the form of a closure relay or an electronic means), which provides a pulse with K_t or K_h Watt-Hours per pulse. The value of K_t or K_h shall be such that the NUEMS's accuracy can be tested in 5 minutes or less for any specific test.

S.1.3.3. Segments. – A segmented digital indicating element shall have an easily accessible provision for checking that all segments are operational.

S.1.3.4. Real-time Indicating Element. – If the indicating element is not on continuously, it shall be accumulated continuously so that real-time measurement is indicated during activation.

S.1.3.5. Multiple Loads, Single Indicating Element. – A primary indicating, or combination indicating-recording element coupled to two or more loads shall be provided with a means to easily, clearly, and definitely display information from a selected load and shall automatically indicate which load is associated with the currently displayed information.

S.1.3.6. NUEMS With External Sensors Located Remotely from the Test Output. – For NUEMS with external sensors located remotely from the test output which can be installed as described in paragraph UR.2.4.8. External Sensors Located Remotely from the Test Output, means shall be provided to allow the test output to be remotely used. S.1.3.7. NUEMS With a Register Ratio. – For NUEMS with a register ratio, the register ratio shall be indicated on the front of the registers that are not an integral part of the NUEMS nameplate. Means shall be provided for the tenant to read the register.

S.2.1. Metrological Components. – A NUEMS shall be designed and constructed so that metrological components are adequately protected from environmental conditions likely to be detrimental to accuracy based on the specified installation locations for the NUEMS.

S.2.2. Provision for Sealing. – 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 undetected access to metrologically significant mechanisms and parameters is prevented. Specifically, after sealing no adjustment or change may be made to:

- (a) any measuring element;
- (b) any metrological parameter that affects the metrological integrity of the device or system; and
- (c) any wiring connection which affects the measurement.

When applicable, any adjusting mechanism shall be readily accessible for purposes of affixing a security seal. Audit trails shall use the format set forth in Table S.2.3. Categories of Device and Methods of Sealing.

Table S.2.3. 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.
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 through the device or through another on-site 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.)

S.2.4. NUEMS Watthour Registration Retention. – The NUEMS shall retain the total accumulated watthour registration and shall not be affected by electrical, mechanical or temperature variations, radio-frequency interference, power failure, or any other environmental influences to the extent that accuracy is impaired. This also applies to other billable quantities.

S.3. Markings. – The following identification and marking requirements are in addition to the requirements of Section 1.10 General Code, paragraph G-S.1. Identification.

S.3.1. Location of Marking Information. – The marking information may be placed either internally or externally (as specified in paragraphs S.3.2. Device Identification and Marking Requirements and S.3.3. External Sensor Identification and in the associated tables) provided:

- i. the information is permanent and easily read; and accessible for inspection;

- ii. the information is on a portion of the device that cannot be readily removed or interchanged (e.g., not on a service access panel). A readily removable cover is an acceptable location for the required information provided: (1) the information is permanently marked elsewhere on the device or is readily accessible through other means such as through an electronic marking display; or (2) a unique marking on the removable cover can be matched with what is programmed into or permanently marked on the NUEMS, thus linking that marking (and any other markings) included on the cover with that specific device.
- iii. accessing the information does not require accessing an area with live exposed voltages greater than 40 V.

The use of a key or tool to access internal marking information is permitted for retail electricity-measuring devices. Where possible, clear covers should be used to enable viewing of internally marked information.

S.3.2. Device Identification and Marking Requirements. – In addition to all the marking requirements of Section 1.10 General Code, paragraph G-S.1. Identification, each device shall have the following information conspicuously, legibly, and indelibly marked on the nameplate or register.

S.3.2.2. Device Identification and Marking Requirements, Internal Sensor (IS) NUEMS. – The following markings shall be physically marked on an Internal Sensor (IS) NUEMS:

- (a) AC voltage range or rating in VAC;
- (b) Watthour constant (K_h) or Watthour test constant (K_t);
- (c) Register ratio (R_r) for NUEMS with a rotating disc and multiplier (if greater than one) preceded by “multiply by” or “mult by”;
- (d) Number of wires (W);
- (e) Form designation (FM) (for A-base and socket NUEMS only); and
- (f) Current Class (CL).

S.3.2.3. Device Identification and Marking Requirements of External Sensor (ES) NUEMS. – In addition to all the marking requirements of Section 1.10 General Code, paragraph G-S.1. Identification, External Sensor (ES) NUEMS shall have the following legibly, and indelibly marked on the NUEMS as shown in:

- Tables S.3.2.3.a. Device Identification and Marking Requirements External Sensor (ES) NUEMS; and
- Table S.3.2.3.b. Descriptors for Table S.3.2.3.a. Device Identification and Marking Requirements External Sensor (ES) NUEMS.





Table S.3.2.3.a. Device Identification and Marking Requirements for External Sensor (ES) NUEMS		
	Physical Marking	Electronic Marking Display*, **
Manufacturer or Distributor name, initials, or trademark (1)	R	D
Model Prefix (2)	O	D
Model (3)	R	D
Serial Number Prefix (4)	O	D
Serial Number (5)	R	D
NTEP CC Number with Prefix (6)	R	D
NUEMS Voltage Input Rating (7) <i>Nonretroactive as of January 1, 2024.</i>	O	D
Voltage Sensor Rating (8) <i>Nonretroactive as of January 1, 2024.</i>	O	D
Voltage Sensor Ratio (9) <i>Nonretroactive as of January 1, 2024.</i>	O	D
NUEMS Current Input Rating (10) <i>Nonretroactive as of January 1, 2024.</i>	O	D
Sensor Primary Current Rating (11) <i>Nonretroactive as of January 1, 2024.</i>	O	D
Sensor True Ratio (12) <i>Nonretroactive as of January 1, 2024.</i>	O	D
K _h or K _t (13)	O	D
Sensor Input Polarity (14)	R	--
Bi-directional (15)	O	D
Temperature Range if narrower than -20 °C to + 50 °C (- 4 °F to + 122 °F) (16)	O	D

R	Required to be marked on the NUEMS
O	Required to be marked on the NUEMS only if information is not available on a display
D	Alternate when information is not marked physically on the NUEMS. If device identification and markings are provided on an electronic marking display, then all fields must be provided.
<p>*“Electronic Marking Display” includes, but is not limited to, displays of the required marking information through a NUEMS display, a mobile device, or other electronic means as specified by the manufacturer and retrievable through the NUEMS. This may include providing access directly from the NUEMS to a webpage. If the information is provided via a mechanism other than primary indicator, the mechanism must be provided by the device owner/operator as specified in UR.2.4.7. Devices for Viewing Marking Information Provided Via an Electronic Marking Display, External Sensor (ES) NUEMS. Also see S.3.4. Electronic Marking Display Security Protocol.</p> <p>**Instructions on how to view required markings shall be marked on the device or provided in the NTEP CC.</p> <p>General:</p> <ul style="list-style-type: none"> Numbers appearing in parentheses (e.g., (1)) following each marking requirement above correspond to numbered descriptors in Table S.3.2.3.b. Descriptors for Table S.3.2.3.a. Device Identification and Marking Requirements of External Sensor (ES) NUEMS. For requirements and details on application, see Table S.3.2.3.b. Descriptors for Device Identification and Marking Requirements of External Sensor (ES) NUEMS. 	

Table S.3.2.3.b.	
Descriptors for Device Identification and Markings Requirement of External Sensor (ES) NUEMS	
1.	Manufacturer’s Identification. Marked per General Code paragraph G-S.1. Identification.
2.	Manufacturer’s Model Prefix. For an External Sensor (ES) NUEMS having its NTEP number clearly identified, conspicuously and indelibly marked on the NUEMS, where the NTEP certificate contains the complete marking details (including a description of the location and purpose of specific markings), the associated NUEMS is not required to be physically marked per General Code paragraph G-S.1. Identification (b)(1).
3.	Manufacturer’s Model Identifier. Also see General Code paragraph G-S.1. Identification.
4.	Serial Number Prefix. For an External Sensor (ES) NUEMS having its NTEP number clearly identified, conspicuously and indelibly marked on the NUEMS, where the NTEP certificate contains the complete marking details (including a description of the location and purpose of specific markings), the associated NUEMS is not required to be physically marked per General Code paragraph G-S.1. Identification (c)(1).

5. Serial Number. Also see General Code paragraph G-S.1. Identification.
6. NTEP Certificate of Conformance Number and Prefix. Marked per General Code paragraph G-S.1. Identification.
7. <i>NUEMS Voltage Input Rating (V). The nominal voltage input(s) for the voltage channel of the ES NUEMS body (e.g., 120VAC, 600VAC, 120-480VAC, etc.). Multiple forms of the term such as “Rated Voltage,” “Max Voltage,” and “Reference Voltage” are permitted.[Nonretroactive as of January 1, 2024]</i>
8. <i>Voltage Sensor Rating (V_{nom}). The nominal input at the voltage sensor. If a voltage sensor is not used this marking is not required. If a voltage sensor is used, a multiplier can be used in place of V_{nom} and voltage sensor ratio. The Voltage Sensor Rating shall be prefaced with the abbreviation “V_{nom}”. [Nonretroactive as of January 1, 2024]</i>
9. <i>Voltage Sensor Ratio (V_{rat}). Ratio of sensor primary voltage to sensor output voltage. If a voltage sensor is not used this marking is not required. If a voltage sensor is used, a multiplier can be used in place of V_{nom} and voltage sensor ratio. The Voltage Sensor Ratio shall be prefaced with the abbreviation “V_{rat}”. [Nonretroactive as of January 1, 2024]</i>
<p>Example of Voltage Sensor Ratio Marking:</p> <p>480V:120V</p>
10. <i>NUEMS Current Input Rating (I_{nom}). The nominal current or voltage input for the current channel of the ES NUEMS body. The NUEMS Current Input Rating shall be prefaced with the abbreviation “I_{nom}”.</i> <p><i>The output of the current sensor must match the input configuration of the NUEMS. This is determined by dividing Sensor Primary Current Rating (11) by the True Ratio (12). The computed quotient must match the NUEMS Current Input Rating (10).A</i></p> <p><i>[Nonretroactive as of January 1, 2024]</i></p> <p>Example 1:</p> <p>Sensor Primary Current Rating = 200A</p> <p>True Ratio = 100A:5A</p> <p>Calculation: $(200A) \div (100A/5A) = (200A) \div (20) = 10A$</p> <p>Example 2:</p>

<p>Sensor Primary Current Rating = 200A</p> <p>True Ratio = 400A:0.3V</p> <p>Calculation: $(200A) \div (400A/0.3V) = (200A) * (0.3V/400A) = 60W/400A = 0.15V$</p> <p>NOTE: W=Watts=Amperes*Volts</p>
<p><i>11. Sensor Primary Current Rating (SI_{nom}). The nominal current input through the sensor. The Sensor Primary Current Rating shall be prefaced with the abbreviation “SI_{nom}”.</i></p> <p><i>[Nonretroactive as of January 1, 2024]</i></p>
<p><i>12. Current Sensor Ratio. The ratio of sensor primary amperes to sensor output amperes or volts shall be physically marked on a NUEMS unless it is displayed electronically. This is to be expressed as xxxA:yyyA or xxxA:yyyV. The number of digits is the number needed to express the values. The Current Sensor Ratio must match the marked ratio of the sensor as required in Table S.3.3.a. [Nonretroactive as of January 1, 2024]</i></p> <p>Examples of current sensor ratio markings include:</p> <p>200A:5A 400A:0.3V</p>
<p>13. Kh or Kt.  Watthour constant or watthour test constant.</p>
<p>14. Sensor Input Polarity. Sensor input connection with intended polarity shall be physically marked on the NUEMS when direction-sensitive.</p>
<p> Bi-Directional.</p>
<p>16. Temperature Range if Narrower Than $-20\text{ }^{\circ}\text{C}$ to $+50\text{ }^{\circ}\text{C}$ ($-4\text{ }^{\circ}\text{F}$ to $+122\text{ }^{\circ}\text{F}$): If the device is rated for use over a range that is narrower than and within $-20\text{ }^{\circ}\text{C}$ to $+50\text{ }^{\circ}\text{C}$ ($-4\text{ }^{\circ}\text{F}$ to $+122\text{ }^{\circ}\text{F}$), this must be physically and/or electronically marked.</p>


S.3.3. Device Identification and Marking Requirements – External Sensors. – In addition to all the marking requirements of Section 1.10 General Code, paragraph G-S.1. Identification, each external sensor that is non-integral with the NUEMS shall have the following conspicuously, legibly, and indelibly marked as shown in Table  S.3.3.a. Device Identification and Marking Requirements – External Sensors and in Table S.3.3.b. Descriptors for Table S.3.3.a. Device Identification and Marking Requirements – External Sensors.

Table S.3.3a.		
Device Identification and Marking Requirements - External Sensors		
	Physical Marking on Sensor	Electronic Marking Display*

S&T 2024 Interim Meeting Agenda
Appendix C – OTH-16.1- Electric Watthour Meters Tentative Code
Electric Watthour Subgroup – Recommendation Crosswalk
NIST HB 44 NUEMS Code to NCWM S&T Committee for 2023 NCWM Annual
Last modified 7/7/2023

Manufacturer name, initials, trademark (1)	R	D
Model Prefix (2)	O	D
Model (3)	R	D
Serial Number Prefix “S/N” (4)	O	D
Serial Number (5)	R	D
True Ratio (7) <i>[Nonretroactive as of January 1, 2024]</i>	R	D
Maximum Primary Current (8)	O	D
Rated Frequency (Hz) (9)	O	D
Maximum Safety Voltage Rating (10)	O	D
Polarity (11)	R	--
<p>R Required to be marked on the device</p> <p>O Required to be marked on the device if information is not available on a display or in printed form</p> <p>D Required when data is displayed on an electronic display or printed document</p> <p>*“Electronic Marking Display” includes, but is not limited to, displays of the required marking information through a NUEMS display, a mobile device, or other electronic means as specified by the manufacturer and retrievable through the NUEMS. This may include providing access directly from the NUEMS to a webpage. If the information is provided via a mechanism other than a dedicated display, the mechanism must be provided by the device owner/operator as specified in UR.2.4.7. Devices for Viewing Marking Information Provided Via an Electronic Display, External Sensor (ES) NUEMS. Also see S.3.4. Electronic Display Security Protocol.</p> <p>Notes:</p> <ul style="list-style-type: none"> Numbers appearing in parentheses (e.g., (1)) following each marking requirement above correspond to numbered descriptors in Table S.3.3.b. Descriptors for External Sensor Marking Requirements. For requirements and details on application, see Table S.3.3.b. Descriptors for External Sensor Marking Requirements. 		

Table S.3.3.b.

Descriptors for Device Identification and Marking Requirements - External Sensors	
12.	Manufacturer's Identification. Marked per General Code paragraph G-S.1. Identification.
13.	Manufacturer's Model Prefix. The General Code paragraph G-S.1. Identification (b)(1) model prefix marking requirement for the sensor(s) may be met with a physical marking. Alternatively, the marking requirement may be satisfied through an electronic display or in a separate document accompanying the NUEMS provided that the NUEMS has its NTEP number clearly identified, conspicuously and indelibly marked on the NUEMS, where the NTEP certificate contains the complete marking details (including a description of the location and purpose of specific markings).
14.	Manufacturer's Model. Also see General Code paragraph G-S.1. Identification.
15.	Serial Number Prefix. For a NUEMS having its NTEP number clearly identified, conspicuously and indelibly marked on the sensor(s), where the NTEP certificate contains the complete marking details (including a description of the location and purpose of specific markings), the associated sensor is not required to meet General Code paragraph G-S.1. Identification (c)(1).
16.	Serial Number. Also see General Code paragraph G-S.1. Identification.
17.	<p>Voltage Sensor Ratio or Current Sensor Ratio. <i>The ratio, in primary amperes or volts to secondary amperes or volts shall be physically marked on each sensor. This is to be expressed as xxxA:yyyA; or xxxA:yyyV; or xxxV:yyyV. The number of digits is the number needed to express the values.</i></p> <p><i>[Nonretroactive as of January 1, 2024]</i></p> <p>Examples of current sensor ratio markings include:</p> <p>200A:5A 400A:0.3V</p> <p>Examples of voltage sensor ratio markings include:</p> <p>480V:120V</p>
18.	Maximum Primary Current. The maximum primary current at which the sensor can be safely and accurately operated.
19.	Rated Frequency. A sensor shall be marked with its rated frequency if other than 40Hz to 400Hz.
20.	<p>Maximum Safe Operating Voltage. A sensor shall be marked with a Maximum Safe Operating Voltage if it is less than 600VAC.</p> <p>Examples of sensor maximum safe operating voltage ratings:</p> <ul style="list-style-type: none"> • 250 Vac • 250 VAC • 50 V <p>Note: The maximum safe operating voltage rating marking may not be higher than the voltage to which the device was verified during type evaluation.</p>

21. Polarity Marking. The sensor shall be marked to indicate proper orientation when the accuracy of the NUEMS is affected by orientation.

S.3.4. Electronic Marking Display Security Protocol – If an Electronic Marking Display is used as described in Table S.3.2.3.a. and Table S.3.3.a. protocols shall be in place to prevent tampering with the displayed markings and/or data.

S.3.5. Abbreviations and Symbols. – When using abbreviations or symbols on a NUEMS, sensor, or indicator, the following shall be used.

Symbol	Description
AC	Alternating Current (i.e., VAC)
Cl	Class
FM	Form
Hz	Hertz, Frequency or Cycles Per Second
I _{nom}	NUEMS Current Input Rating
K _h	Watthour Constant; Revolution or Pulse
K _t	Watthour Test Constant
kWh	Kilowatt-hour
R _r	Register Ratio
SI _{nom}	Sensor Primary Current Rating
TA	Test Amperes
V	Volts
V _{nom}	Voltage Sensor Rating
V _{rat}	Voltage Sensor Ratio
W	Wire (example 240V 3W)
Wh	Watthour


S.3.6 Abbreviations and Symbols – These are abbreviations that may occur but are not required to be used or limited to the listed abbreviations.


Symbol	Description
--------	-------------

Δ	Delta Power Supply
B	Burden
BIL	Basic Lightning Impulse Insulation Factor
IEEE	Institute of Electrical and Electronics Engineers
Mult By	Multiply By
PD	Printable Data
PTR	Potential Transformer Ratio (Same as VTR)
SD	Soft Data
VTR	Voltage Transformer Ratio
Y	WYE Power Supply

NOTES

N.1. NUEMS No-Load Test. – A NUEMS no-load test shall be conducted by applying rated voltage to the NUEMS under test and no current load applied. This test shall be conducted during type evaluation and may be conducted during field testing as deemed necessary. The test duration shall be ten minutes.

N.2. NUEMS Starting Load Test. – A NUEMS starting load test shall be conducted by applying rated voltage at a load of 0.25% of the Current Class (CL) or the Sensor Primary Current Rating at unity power factor.  The test shall be conducted during type evaluation and may be conducted during field testing as deemed necessary.

N.3. NUEMS Minimum Test Duration. – A NUEMS full load test shall consist of a minimum of 10  K_t or K_h output indications and a light load test shall consist of a minimum of one K_h or K_t output indication.

N.4. NUEMS Test Loads.

- (d) Internal Sensor (IS) NUEMS shall be balanced-load tested, and may be single-element tested, for NUEMS accuracy at full and light loads.
- (e) External Sensor (ES) NUEMS shall be single-element tested for system accuracy at full and light loads. NUEMS testing shall be accomplished by applying the test load to the sensor(s) with the voltage circuits energized. When it is not feasible to test the system by injecting a primary current, testing using customer load shall be sufficient for field verification.
- (f) The reference voltage phases (A, B, or C) at the NUEMS shall be the same phase as the load.

N.5. Test of a NUEMS.

- (g) The test load applied for a full load test shall be 15 % of either the Current Class (CL) or the Sensor Primary Current Rating.
- (h) The test load applied for a light load test shall be conducted at 1.5 % to 3 % of either the Current Class (CL) or the Sensor Primary Current Rating.
- (i) The test load applied for a full load test of a NUEMS for a 0.5 power factor lagging setting shall be 15 % of either the Current Class (CL) or the Sensor Primary Current Rating. This test shall be conducted during type evaluation and may be conducted during in-service (field) or laboratory testing as deemed necessary.
- (j) The test load applied for a light load test for a 0.5 power factor lagging setting shall be conducted at 3 % to 6 % of either the Class (CL) or the Sensor Primary Current Rating. This test shall be conducted during type evaluation and may be conducted during in-service (field) or laboratory testing as deemed necessary.
- (k) All tests shall be made at the rated voltage ± 10 %.

N.6. Repeatability Tests. – When conducted, 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.

T. TOLERANCES

T.1. Tolerances, General.

- (d) The tolerances apply equally to errors of underregistration and errors of overregistration.
- (e) The tolerances apply to all electric energy measured at any load within the rated measuring range of the device.
- (f) Where sensors or other components are used, the provisions of this section shall apply to the entire NUEMS.

T.2. No-Load Test. – A NUEMS shall not indicate more than one K_i or K_h .

T.3. NUEMS Starting Load Test. – The K_i or K_h output indications shall continue to advance. The purpose of this section is to verify that the NUEMS accumulates energy at the starting load.

T.4. Load Test Tolerances. – Tolerances for NUEMS shall be as shown in Table T.4. Tolerances for NUEMS. When it is not feasible to test the system by injecting a primary current, tolerances specified under “Tests Conducted at 0.5 Lagging Power Factor” shall apply.

Table T.4. Tolerances for NUEMS		
	Tests Conducted at Unity Power Factor	Tests Conducted at 0.5 Lagging Power Factor

Acceptance Tolerances	1.0 %	2.0 %
Maintenance Tolerance	2.0 %	3.0 %

T.5. Repeatability. – When multiple load tests are conducted at the same load condition, the range of the load test results shall not exceed 25 % of the absolute value of the maintenance tolerance and the results of each test shall be within the applicable tolerance.

UR. User Requirements

UR.1. Selection Requirements.

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.

- (d) Console display which is accessible to the customer on which the customer can unambiguously select the NUEMS output associated with this load.
- (e) Remote display which is provided to customer as a part of the system.
- (f) At the option of the customer, an application that provides readings in real time.

UR.1.2. NUEMS Required. – When a tenant is not directly served by the serving utility, and charges for electric energy are not included in the fixed periodic rent charges, a dedicated NUEMS that measures only the energy used at the discretion of the tenant shall be used.

UR.1.3. Suitability of Equipment. – A NUEMS shall be suitable for use on its electrical system.

UR.1.3.1. Service Applications. – A NUEMS shall accurately measure all loads 5 percent or greater of the electric service capacity of the tenant. Service capacity shall be determined by the master thermal overload protectors to the tenants' service or by the rated capacity of the wiring and its circuits used to provide power from the service panel to the tenant.

$$Annual\ Max = \sum_{phases} [(Phase\ Voltage * Current\ Class)/1000] * HoursPerYear$$

NOTE: Current Class is equivalent to Sensor Primary Current Rating

UR.1.3.2. Quantity-Value Division. - The configured quantity-value division shall not exceed the minimum increment to be used in billing.

UR.1.4. Sensors. –Each sensor output shall be correctly matched to the corresponding ES NUEMS body input.

UR.2. Installation Requirements.

UR.2.1. Manufacturer's Instructions. – A device shall be installed in accordance with the manufacturer's instructions, and the installation shall be sufficiently secure and rigid to maintain this condition.

UR.2.2. Load Range. – A device shall be installed so that the current and voltage will not exceed the maximum continuous ratings of the NUEMS. If necessary, means to limit current and/or voltage shall be incorporated in the installation.

UR.2.3. Regulation Conflicts and Permit Compliance. – If any provision of this section (UR.2. Installation Requirements) is less stringent than that required of a similar installation by the National Electrical Code®, as amended and adopted by the Local Authority having Jurisdiction, the installation shall be in accordance with the National Electric Code.

The installer of any new NUEMS service shall obtain all necessary permits and shall conform to all applicable regulations.

UR.2.4. NUEMS Installation Requirements.

UR.2.4.1. Certification. – It is the responsibility of the owner of a NUEMS to obtain written approval for each metered load service from the serving utility, public utility commission, or other entity with jurisdiction over electric utilities in the location the NUEMS is to be installed.

The required approval shall meet the requirements of that entity and shall identify the address, space, or number, of the premise served by the NUEMS connection; be signed by an agency representative; and shall clearly state the:

- the installation meets all installation and accessibility requirements for similar installation governed by the presiding entity.
- installation is on a tariff schedule that qualifies for electric meter use,
- billing format, rates, and charges conform to all applicable tariff rules,
- date of such determination, and
- designee's name and title if performed by a designee, and the name and title of the presiding entity authorizing the designee to make the determination.

The approval shall be provided to the local Weights & Measures authority prior to a NUEMS being used for commercial purposes.

UR.2.4.2. NUEMS Test Features. – All NUEMS shall be provided with test features to facilitate common tests methods used in the electrical submetering industry.

UR.2.4.3. Safety Mechanism. – NUEMS installations that are equipped with current sensors with a current output that is not self-limiting shall have a mechanism installed to allow the NUEMS, or its components, to be connected to or removed for safe testing without the risk of dangerous voltages that can result from secondary open circuit current sensors.

UR.2.4.4. Metered Circuits (Submeter Load Service). – For NUEMS with separate line and load service connections, all electricity used by a tenant shall be taken exclusively from the load service of the tenant's

NUEMS. This service and its associated NUEMS shall accurately measure the tenant's load and be capable of being used only at the discretion of the tenant.

UR.2.4.5. Dedicated Tenant NUEMS Service. – A NUEMS shall serve only the space, lot, building, room, suite, stall, slip, or **any** other termed premise occupied and/or used by the tenant.

UR.2.4.6. NUEMS Tenant Premise Identification. – Tenant premise identification shall be clearly and permanently shown on or at the NUEMS, and on all separate components of a NUEMS, including, but not limited to, current sensor(s), modem(s), and transmitter(s) if equipped. Remote indications and all printed indications shall be readily identifiable and readily associated with the tenant's premise. Printed indications shall also include time and date information. For field configured systems the information shall be after actual configuration is established. UR.2.4.7. Devices for Viewing Marking Information Provided Via an Electronic Marking Display, External Sensor (ES) NUEMS. – When required markings are provided via an electronic display the owner/operator of the NUEMS is responsible for providing means for viewing this information on the site at the time of inspection or on request. See also Table S.3.2.3.a. Device Identification and Marking Requirements for External Sensor (ES) NUEMS.

UR.2.4.8. External Sensors Located Remotely From the Pulse Output. – If the NUEMS is installed in such a way that testing cannot be conducted by a single inspector from a reasonable testing position, then means shall be provided to allow the pulse output to be remotely used at the sensor location. For example, a portable device that receives the pulse by radio/WiFi and provides the pulse to the test equipment.

UR.3. Use of Device.

UR.3.1. Recorded Representations. – A record, either printed or electronic, providing the following information on electrical energy usage shall be available at the end of the billable interval:

- (a) the total quantity of the energy delivered with unit of measure;
- (b) the total computed price of the energy sale;
- (c) the unit price of the energy.

For systems capable of applying multiple unit prices for energy during the billable interval, the following additional information is required:

- (1) A schedule of the rate time periods and the unit price applied for each
- (2) the total quantity of energy delivered during each;
- (3) the total purchase price for the quantity of energy delivered during each rate time period.

UR.4. Submitting a NUEMS for Testing. – Each NUEMS Submitted for inspection shall have all necessary components assembled, connected, and configured as intended for use. Components may include, but are not limited to, the **ES** NUEMS body, sensor(s), indicator(s), etc.”

APPENDIX D. DEFINITIONS

The following definitions are proposed for addition to NIST Handbook 44 Appendix D, Definitions at the time when the status of this Tentative Code is changed from “tentative” to “permanent.” Until such time that the status of the code is designated as “permanent,” these proposed definitions will remain in this section of the Tentative Code.

The specific code to which the definition applies is shown in [brackets] at the end of the definition. Definitions for the General Code [1.10] apply to all codes in Handbook 44.

A

active energy. – The integral of active power with respect to time. Typically measured in units of kilowatt-hours (kWh), or watt-hours.

$$E(T) = \int_0^T v(t) \cdot i(t) \cdot dt \quad \text{Eq. 2}$$

Where T is much greater than the period of the AC line frequency.

alternating current (AC). – An electric current that reverses direction in a circuit at regular intervals. [3.XX]

ampere. – The practical unit of electric current. It is the quantity of current caused to flow by a potential difference of one volt through a resistance of one ohm. One ampere is equal to the flow of one coulomb of charge per second. One coulomb is the unit of electric charge equal in magnitude to the charge of 6.24×10^{18} electrons. [3.XX]

audit trail. – An electronic count and/or information record of the changes to the values of the calibration or configuration parameters of a device. [1.10, 2.20, 2.21, 2.24, 3.30, 3.37, 3.39, 3.XX, 5.56(a)]

(Added 1993)

B

balanced load. – Balanced load is used to indicate equal currents in all phases and relatively equal voltages between phases and between each phase and neutral (if one exists); with approximately equal watts in each phase of the load. [3.XX]

basic lightning impulse insulation level (BIL). – A specific insulation level expressed in kilovolts of the crest value of a standard lightning impulse. (Example: BIL = 10 Kv) [3.XX]

bidirectional. – A NUEMS equipped to register the accumulation of energy in both directions (i.e., for delivered and received energy):

A bidirectional NUEMS shall fall into at least one of the following categories:

- (c) Single register or net meter that displays the difference between the delivered and received energy; or
- (d) Separate register(s) for delivered or received. [3.XX]

burden (B). – The impedance of the circuit connected to the instrument transformer's secondary winding. (Example: B = 21 Ohms Max) [3.XX]

C

calibration parameter. – Any adjustable parameter that can affect measurement or performance accuracy and, due to its nature, needs to be updated on an ongoing basis to maintain device accuracy, e.g., span adjustments, linearization factors, and coarse zero adjustments. [2.20, 2.21, 2.24, 3.30, 3.37, 3.39, 3.XX, 5.56(a)]

(Added 1993)

configuration parameter. – Any adjustable or selectable parameter for a device feature that can affect the accuracy of a transaction or can significantly increase the potential for fraudulent use of the device and, due to its nature, needs to be updated only during device installation or upon replacement of a component, e.g., division value (increment), sensor range, and units of measurement. [2.20, 2.21, 2.24, 3.30, 3.37, 3.XX, 5.56(a)]

(Added 1993)

current. – The rate of the flow of electrical charge past any one point in a circuit. The unit of measurement is amperes or coulombs per second. [3.XX]

current class (CL). – For Internal Sensor (IS) NUEMS, the manufacturer's designated maximum rated current a NUEMS can measure continuously without damage and without exceeding limits of accuracy. (Example: CL 200) [3.XX]

current sensor. – A device able to measure and output analog or digital representations of one or more currents. Examples of current sensors are current transformers, low-voltage current transducers, and Rogowski coils. *(OWM is seeking written permission from National Electrical Manufacturers Association (NEMA) to reprint . Oral permission was received.)*

E

Electronic Marking Display – A device used for the electronic visual presentation of marking requirements.

element. – A combination of a voltage-sensing unit and a current-sensing unit, which provides an output proportional to the quantities measured. NUEMS can include multiple elements based on service type. For some IS NUEMS, this is also referred to as a “stator.” *(OWM is seeking written permission from National Electrical Manufacturers Association (NEMA) to reprint . Oral permission was received.)* [3.XX]

energy flow. – The flow of energy between line and load terminals (conductors) of a NUEMS. Flow from the line to the load terminals is considered energy delivered. Energy flowing in the opposite direction (i.e., from the load to line terminals) is considered as energy received. [3.XX]

equipment, commercial. – Weights, measures, and weighing and measuring devices, instruments, elements, and systems or portion thereof, used or employed in establishing the measurement or in computing any basic charge or payment for services rendered on the basis of weight or measure. As used in this definition, measurement includes the determination of size, quantity, value, extent, area, composition (limited to meat and poultry), constituent value (for grain), or measurement of quantities, things, produce, or articles for distribution or consumption, purchased, offered, or submitted for sale, hire, or award. [1.10, 2.20, 2.21, 2.22, 2.24, 3.30, 3.31, 3.32, 3.33, 3.34, 3.35, 3.38, 3.XX, 4.40, 5.51, 5.56.(a), 5.56.(b), 5.57, 5.58, 5.59]

(Added 2008)

ES NUEMS body – The element of the NUEMS that calculates the electricity usage using the signals from the external sensors.

external sensor. – Any voltage sensor or current sensor not located inside of the meter body NUEMS itself and not inside the sealed enclosure containing the NUEMS. [3.XX]

event counter. – A nonresettable counter that increments once each time the mode that permits changes to sealable parameters is entered and one or more changes are made to sealable calibration or configuration parameters of a device. [2.20, 2.21, 3.30, 3.37, 3.39, 3.XX, 5.54, 5.56(a), 5.56(b), 5.57]

(Added 1993)

event logger. – A form of audit trail containing a series of records where each record contains the number from the event counter corresponding to the change to a sealable parameter, the identification of the parameter that was changed, the time and date when the parameter was changed, and the new value of the parameter. [2.20, 2.21, 3.30, 3.37, 3.39, 3.XX, 5.54, 5.56(a), 5.56(b), 5.57]

(Added 1993)

F

form designation (FM). –An alphanumeric designation denoting the circuit arrangement for which the NUEMS is applicable and its specific terminal arrangement. The same designation is applicable to equivalent NUEMS for all manufacturers. (Example: FM 2S) [3.XX]

H

hertz (Hz). – Frequency or cycles per second. One cycle of an alternating current or voltage is one complete set of positive and negative values of the current or voltage. [3.XX]

I

internal sensor. – Any voltage sensor or current sensor located inside of the meter body NUEMS itself or inside the sealed enclosure containing the NUEMS. [3.XX]

K

kilowatt (kW). – A unit of power equal to 1,000 watts. [3.XX]

kilowatt-hour (kWh). – A unit of energy equal to 1,000 watthours. [3.XX]

L

line service. – The service terminals or conductors connecting the (NUEMS) to the power source. [3.XX]

load service. – The service terminals or conductors connecting the (NUEMS) to the electrical load (e.g., vehicle, tenant, etc.). [3.XX]

load, full. – A test condition with rated voltage, current at 100% of test amps level, and power factor of 1.0. [3.XX]

load, light. – A test condition with rated voltage, current at 10% of test amps level, and power factor of 1.0. [3.XX].

M

master meter, electric. – A (NUEMS) owned, maintained, and used for commercial billing purposes by the serving utility. All the electric energy served to a submetered service system is recorded by the master meter. [3.XX]

metrological components. – Elements or features of a measurement device or system that perform the measurement process or that may affect the final quantity determination or resulting price determinations. This includes accessories that can affect the validity of transactions based upon the measurement process. The measurement process includes determination of quantities; the transmission, processing, storage, or other corrections or adjustments of measurement data or values; and the indication or recording of measurement values or other derived values such as price or worth or charges. [3.XX]

N

nominal current – The manufacturer's designated maximum rated current a NUEMS can measure continuously without damage and without exceeding limits of accuracy.

nominal voltage – The manufacturer's designated maximum rated voltage a NUEMS can measure continuously without damage and without exceeding limits of accuracy.

non-integral. – Used to describe external sensors that can be disconnected from the meter body. [3.XX]

non-utility electricity measuring system (NUEMS). – An electricity measuring system comprised of all the metrologically relevant components required to measure electrical energy, store the result, and report the result used in non-utility sales of electricity wherein the sale is based in whole or in part on one or more measured.

O

ohm. – The practical unit of electric resistance that allows one ampere of current to flow when the impressed potential is one volt. [3.XX]

P

percent error. – Percent error is calculated as follows:

percent error = (NUEMS reading – standard reading)/standard reading x 100
[3.XX]

power factor (PF). – The ratio of “active power” to “apparent power” in an AC circuit. It describes the efficient use of available power. [3.XX]

primary indicating or recording elements. – The term “primary” is applied to those principal indicating (visual) elements and recording elements that are designed to, or may, be used by the operator in the normal commercial use of a device. The term “primary” is applied to any element or elements that may be the determining factor in arriving at the sale representation when the device is used commercially. (Examples of primary elements are the visual indicators for meters or scales not equipped with ticket printers or other recording elements and both the visual indicators and the ticket printers or other recording elements for meters or scales so equipped.) The term “primary” is not applied to such auxiliary elements as, for example, the totalizing register or predetermined-stop mechanism on a meter or the means for producing a running record of successive weighing operations, these elements being supplementary to those that are the determining factors in sales representations of individual deliveries or weights. (See “indicating element” and “recording element.”) [1.10, 3.XX]

R

reactive power. – For sinusoidal quantities in a two-wire circuit, reactive power is the product of the voltage, the current, and the sine of the phase angle between them, using the current as the reference. [3.XX]

register ratio (R_r). – The number of revolutions of the gear meshing with the worm or pinion on the rotor shaft per complete rotation of the fastest (most sensitive) wheel or dial pointer. [3.XX]

remote configuration capability. – The ability to adjust a weighing or measuring device or change its sealable parameters from or through some other device that is not itself necessary to the operation of the weighing or measuring device or is not a permanent part of that device.[2.20, 2.21, 2.24, 3.30, 3.37, 3.39, 3.XX, 5.56(a)]

(Added 1993)

retail device. – A measuring device primarily used to measure product for the purpose of sale to the end user. [3.30, 3.32, 3.37, 3.39, 3.XX]

(Amended 1987 and 2004)

S

sensor ratio. – The stated ratio of the primary circuit current or voltage compared to the secondary circuit current or voltage. (example: CSR = 200 : 0.1) [3.XX]

serving utility. – The utility distribution company that owns the master meter and sells electric energy to the owner of a submeter system. [3.XX]

starting load. – The minimum load above which the device will indicate energy flow continuously. [3.XX]

submeter. – A meter or meter system downstream of the electric master meter. [3.XX]

T

tenant. – The person or persons served electric energy from a non-utility electricity-measuring system (NUEMS). [3.XX]

test amperes (TA). – The full load current (amperage) specified by the device manufacturer for testing and calibration adjustment. (Example: TA 30). [3.XX]

thermal overload protector. – A circuit breaker or fuse that automatically limits the maximum current in a circuit. [3.XX]

U

unit price. – The price at which the product is being sold and expressed in whole units of measurement. [1.10, 3.30, 3.XX]

(Added 1992)

utility. – A corporation, person, agency, authority, or other legal entity or instrumentality aligned with distribution facilities for delivery of electric energy for use primarily by the public. Included are investor-owned electric utilities, municipal and State utilities, Federal electric utilities, and rural electric cooperatives. A few entities that are tariff based and corporately aligned with companies that own distribution facilities are also included.

A list of recognized utilities in the U.S. can be found at the U.S. Energy Information Administration (EIA) at: <https://www.eia.gov/electricity/data/eia861> [3.XX]

V

volt. – The practical unit of electromotive force. One volt will cause one ampere to flow when impressed across a resistance of one ohm. [3.XX]

W

watt. – The practical unit of electric power. In an alternating-current circuit (AC), the power in watts is volts times amperes multiplied by the circuit power factor. [3.XX]

watthour (Wh). – The practical unit of electric energy, which is expended in one hour when the average power consumed during the hour is one watt. [3.XX]

meter – self-contained. – A meter in which the terminals are arranged for connection to the circuit being measured without using external instrument transformers. [3.XX]

watthour constant (K_h). – The expression of the relationship between the energy applied to the meter and the output indication, expressed as “watthours per revolution” or “watthours per output indication.” [3.XX]

watthour test constant (K_t). – The expression of the relationship between the energy applied to the meter and the output indication, expressed as “watthours per output indication,” when the meter is in test mode [3.XX]

Professional Development Committee (PDC) 2024 Interim Meeting Agenda

Mr. Ethan Bogren, Committee Chair
Westchester County, New York

INTRODUCTION

The PD Committee will address the following items in Table A during the Interim Meeting. Table A identifies the agenda items by reference key, title of item, page number and the appendices by appendix designations. The first four digits of an item's reference key are assigned from the Subject Series List. The acronyms for organizations and technical terms used throughout the agenda are identified in Table B. In some cases, background information will be provided for an item. The fact that an item appears on the agenda does not mean it will be presented to National Conference on Weights and Measures (NCWM) for a vote. The Committee will review its agenda and may withdraw some items, present some items for information meant for additional study, issue interpretations, or make specific recommendations for change to the publications identified which will be presented for a vote at the Annual Meeting. The Committee may also take up routine or miscellaneous items brought to its attention after the preparation of this document. The Committee may decide to accept items for discussion that are not listed in this document, providing they meet the criteria for exceptions as presented in Section H of the introductions to *Handbook 44* and *Handbook 130*. The Committee has not determined whether the items presented will be Voting or Informational in nature; these determinations will result from their deliberations at the Interim Meeting.

An "Item Under Consideration" is a statement of proposal and not necessarily a recommendation of the Committee. Suggested revisions are shown in **bold face print** by ~~striking-out~~ information to be deleted and underlining information to be added. Requirements that are proposed to be nonretroactive are printed in ***bold faced italics***.

All sessions are open to registered attendees of the conference. 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

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		397
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Appendices

A	EDU-2: Summary of NIST OWM Training Conducted in 2019	A375
B	EDU-2: NIST OWM Training - Future Plans	B377

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 Conference 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 nine 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 and Basic Package Checking. Reporting on the Precision Scales exam begins this year. 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.

Proctoring was initiated as a first step towards accreditation of the certification program. Each organization is required to register the proctors they intended to use. Proctor qualifications are different for basic competency exams and professional certification exams so two lists of proctors are maintained. To eliminate conflicts of interest, proctors for professional certification exams must not be immediate supervisors of the candidate. Virtual proctoring was initiated in May 2021 and offered at no cost to members through the end of December 2021.

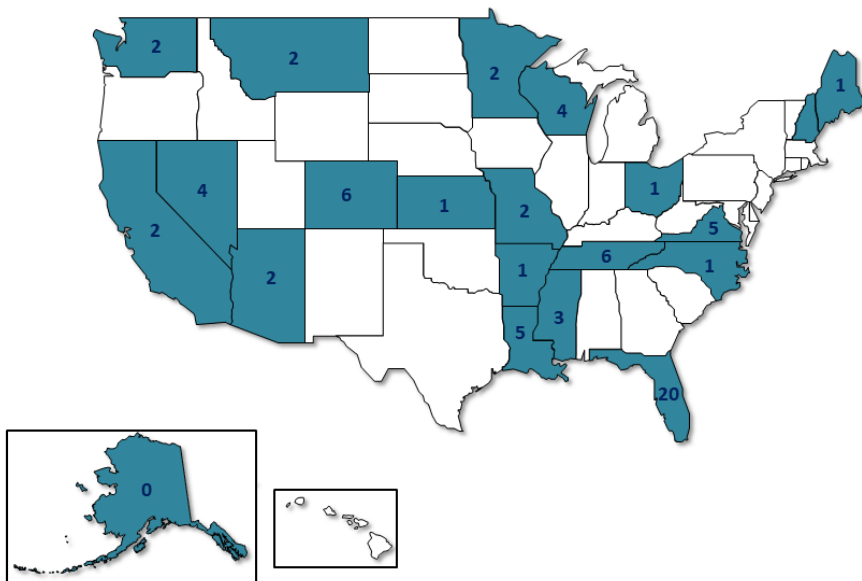
The requirements for proctors are posted on the NCWM website at <https://www.ncwm.com/proctoring>. Guidance for virtual proctoring can be found on the same webpage and more detailed information, including a helpful YouTube video on preparing for proctoring can be found on the ProctorU website at <https://support.proctoru.com/hc/en-us/articles/360043565051-Exam-Day-What-to-Expect->.

Number of States with Proctors and number of Proctors. (As of November 2021)

	Professional Certification		Basic Certification	
	States	Proctors	States	Proctors
FY 17-18	7	17	10	39
FY 18-19	11	28	14	57
FY 19-20	16	37	18	70
FY 20-21	17	41	19	73
FY 21-22	19	44	20	78

1 **Proctors per state – Basic Competency Exams:**

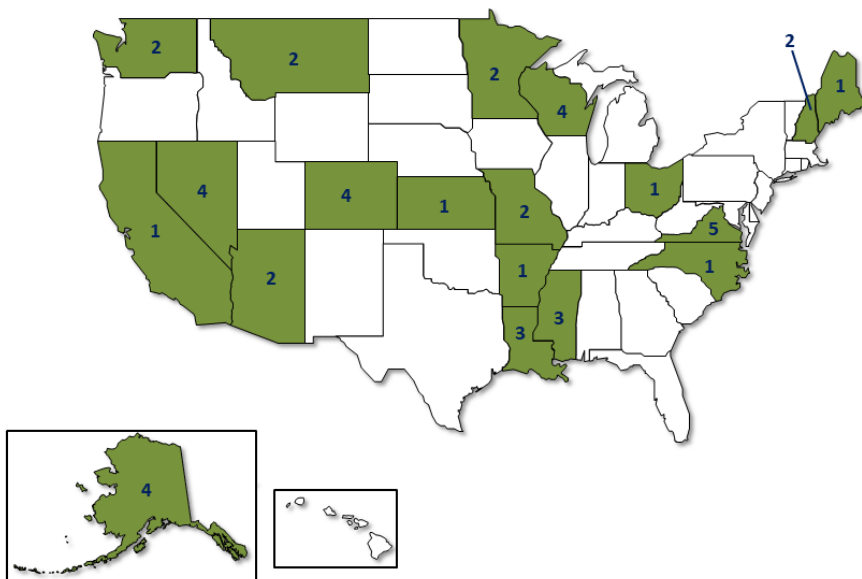
Distribution of Certified Proctors per State: Basic Competency Exams
Updated: November 2022



2

3 **Proctors per state – Professional Certification Exams:**

Distribution of Certified Proctors per State: Professional Certification Exams
Updated: November 2022



4

The table below shows the number of virtual and in-person proctored tests completed in FY 21-22.

	In-person	Virtual
Professional Certification	84	8
Basic Competency Certification	50	5

Status of Current Tests

The NCWM has issued 1267 professional certificates since program inception through September 30, 2021. Of the certificates issued, fifteen have been issued to individuals in the private sector. There has been a significant decline in participation in the program. It appears that the decline coincides with the requirement to proctor exams and the pandemic. Some of the certificates have reached their 5-year expiration and certificate holders will need to seek recertification.

NCWM Professional Certificates

The table below shows the number of certificates awarded over the past ten years and the cumulative total since program inception.

	FY 12-13	FY 13-14	FY 14-15	FY 15-16	FY 16-17	FY 17-18	FY 18-19	FY 19-20	FY 20-21	FY 21-22
Certificates Awarded	105	62	198	140	142	257	53	56	60	56
Cumulative	243	305	503	643	785	1042	1095	1151	1211	1267

The table below shows the states using the professional certification program and the number of certificates earned since program inception and includes expired certificates. The Committee applauds these states and encourages increased use of the certification program.

State	Certificates	State	Certificates	State	Certificates
Minnesota	153	Arizona	28	Wyoming	7
Missouri	143	Nevada	28	Arkansas	6
Louisiana	109	Maine	26	Delaware	4
Wisconsin	96	New Mexico	25	Michigan	3
Maryland	79	New York	19	South Dakota	3
Virginia	70	Colorado	18	Montana	2
Alaska	57	Connecticut	15	Oregon	2

Mississippi	56	Private	15	Tennessee	2
North Carolina	56	Ohio	14	New Hampshire	1
Washington	50	Idaho	11	West Virginia	1
Kansas	46	Massachusetts	11		
California	41	Pennsylvania	8		
Nebraska	33	Vermont	8		

1 NCWM Basic Competency Certificates

2 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	Cumulative
Basic - Measuring	0	40	14	5	7	66
Basic - Weighing	1	30	11	12	9	63
Total Awarded	1	70	25	17	16	129

3

4 The table below shows those states with individuals holding a basic competency certificate. The Committee applauds
5 these states and encourages increased use of the certification program nationwide

State	Certificates	State	Certificates
Louisiana	59	Nevada	2
Tennessee	42	Nebraska	2
Alaska	7	Arkansas	1
Colorado	5	Kansas	1
Private	1	Montana	1
Florida	3		

6

7 NCWM Meeting Comments:

8 NCWM 2023 Interim Meeting: During the 2023 Interim Meeting an updated presentation was provided by Jerry
9 Buendel, (Exam Coordinator). Mahesh Albuquerque (CO) thanked Jerry and the committee for the work done on
10 advancing the certification program and appreciated the extension to the service organizations. He also suggested we
11 consider general industry as a potential source of input for the development of exams. Scott Simmons (CO) echoed
12 Mahesh's comments and feels they have benefitted greatly from the program and having these credentials lends weight
13 to the department. One issue they have encountered is that their proctors aren't typically full-time and may not be
14 fully familiar with NCWM and our processes for testing. Also, the online process via Proctor U resulted in issues due
15 to a required plug-in not being able to be installed on individual's government computers due to departmental IT
16 policy, so a home computer had to be used. Also, the process did not seem particularly user-friendly. Additionally,
17 some of the forms were not compatible with the version of the Office suite on the computer in use. Scott would like
18 to see the limitations on proctoring by individuals in chain-of-command be relaxed to allow proctoring by certified
19 proctors within the organization. David Deroche (LA) testified that the time for taking the test might be too short, and
20 that the expanding handbook makes it difficult to complete the test within the time allotted. He asked how these time
21 limits are being determined. Also, he indicated that the lack of feedback after testing was not particularly helpful

especially if the test taker failed. Jerry responded to the test time question by indicating that most of those that pass complete the test well before time expires, and not many timeouts occur. Ivan Hankins (IA) referred the body to the online versions of field training manuals covering various sections of HB44 that could be used in place of a hard copy or at least be used as a training resource for inspectors. Brent Ricks (MT) followed up and thanked Ivan for the training materials mentioned above. Montana is troubled by non-resident personnel coming into service national chain devices etc. and finds the certification program useful to control this. Brent feels we're on the right track with the certification program. Doug Musick (KS) feels like the bar may be being set too high for some of the target audience e.g., service companies. (Not the test itself, the process.) Ray Woolfolk (Alaska) stated Alaska was having difficulty with arranging proctors, and echoed Scott's suggestion of allowing proctors from within the organization. He also indicated that they are pleased with the exam content. Vince Wolpert (AZ) likes the exams however, proctoring is an issue. Long travel times to get to a proctor makes the online option a valuable new approach. Also, cross-certification between states is still something he'd like to see. David Deroche (LA) returned to the microphone to question the content that may not be applicable to their state but is included in the test along with the pertinent material. More resources to prepare or learn HB44 material would be helpful. Greg Vander Platts (MN) echoed that proctoring is a bit of a challenge still. Joe Smith (WI) echoed proctoring is a challenge and it would be better to allow W&M staff to act as proctors even if they are in the same department. Tim Chesser (AR) echoed Scott Simmons suggestion for internal proctoring.

In the work session, the Committee discussed allowing employees from within the Weights and Measures authority to qualify as proctors for both the professional certification and the basic competency exams. The PDC recommends the BOD consider allowing this moving forward. Also, the PDC will work to resolve the concerns related to the limited feedback on failed test questions provided by the current process.

2023 Annual Meeting: Jerry Buendel (Retired), Professional Certification Program coordinator, gave an update on the professional certification program. He discussed the new exams for Registered Service Agents (RSAs) coming online this year, as well as the proctoring requirement adopted in 2018, and the new proctoring options that have been made available within the program. Tim Chesser (AR) thanked the subject matter experts who participated in the test development and recognized the effort. He also asked whether the RSAs passing the test would be given something (e.g. a hard copy of a certification letter) to prove that they had passed an exam.

Regional Association Comments:

CWMA 2023 Interim Meeting: Greg Vanderplaats, Minnesota, Proctoring policy for professional certification exams has changed and is posted on NCWM website. Now allowing Proctors within the program as long as there is no conflict of interest. Mike Harrington, Iowa. Iowa is happy with the changes to the policy and their program will now be participating. Greg Vanderplaats, Minnesota, Jerry Buendel working to use the state specific exams for RSA testing. RSA tests for HB 44, RFMD, Retail Scales are written and in testing.

The committee recommends this as an Informational Item.

WWMA 2023 Annual Meeting: Mahesh Albuquerque (Division of Oil and Public Safety, CO) – Proctor recommendation was approved by NCWM BOD and implemented. Don Onwiler has sent an email about agency proctors to all states. The WWMA PDC applauds this change.

The committee recommends this as an informational item.

SWMA 2023 Annual Meeting: The PDC heard no comments on this item and recommends the item remain an informational item.

NEWMA 2023 Interim Meeting: During the 2023 NEWMA Interim meeting an update was provided by Marc Paquette (Vermont). During the update changes in proctoring requirements and RSA Exams were discussed. Cheryl Ayer (New Hampshire) expressed her appreciation for the revamp on proctoring requirements.

The committee recommends this as and 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

1 of weights and measures jurisdictions and to serve as a link to various training materials on the web.

2 At the 2023 Interim Meeting, Mrs. Tina Butcher (NIST OWM) provided the following “Summary of NIST OWM
3 Training Conducted in 2022.” Mrs. Butcher also provided an update on plans for OWM training in 2023 and other
4 work underway at NIST to assist weights and measures jurisdictions and industry representatives with legal metrology
5 training.

Summary of NIST OWM Training Conducted in 2022			
Area/Course Name	Start Date	Location	No. of Students
Laboratory Metrology			
Fundamentals of Metrology GAP Interim (at RMAPs)	3/31/22 & 5/19/22	RMAPs	6
Advanced Mass Seminar (Rev 2015)	7/11/22	Gaithersburg, MD	6
Fundamentals of Metrology (3 sessions)	1/31/22, 6/27/22, 8/22/22	Gaithersburg, MD	19
Mass Metrology Seminar (3 sessions)	2/28/22, 4/25/22, 8/1/22	Gaithersburg, MD	15
Volume Metrology Seminars (4 sessions)	2/7/22, 2/14/22, 5/9/22, 8/29/22	Gaithersburg, MD	16
Regional Measurement Assurance Programs (RMAPs)			
SEMAP	03/28/22	Frankfort, KY	25
WRAP	05/16/22	Sparks, NV	21
NEMAP	06/13/22	Avenel, NJ	32
SWAP	09/12/22	Las Cruces, NM	25
MidMAP	09/26/22	Madison, WI	22
Webinars			
Basic Uncertainty Concepts	3/17/22	Web-based	9
Contract Review	6/23/22	Web-based	7
Document Control and Record Keeping	4/14/22	Web-based	13
Fundamentals of Metrology - Overview (2 sessions)	3/15/22 & 5/24/22	Web-based	34
Internal Auditing Best Practices	2/24/22	Web-based	6
Software Verification and Validation	7/28/22	Web-based	7
State Laboratory Annual Submission Process	7/7/22	Web-based	54
Metric			
Info Session – Metric Education Resources (2 sessions)	2/10/22	Web-based	8
	7/21/22	Web-based	6
Info Session – Metric Estimation (2 sessions)	2/17/22	Web-based	4
	7/28/22	Web-based	5
Measurement System Basics – SI and US Customary Units for Regulatory Officials	3/2/22	Webinar	25
Laws and Regulations			
Packaging & Price Verification			
Handbook 130 – Examination Procedure for Price Verification (3 Sessions)	1/4/22; 4/5/22; 9/1/22	Web-based	106
Handbook 130 – Overview of the Uniform Packaging and Labeling Regulation (3 Sessions)	1/20/22; 4/13/22; 8/30/22	Web-based	110
Handbook 133 – How to Test Animal Bedding (3 sessions)	1/5/22; 4/6/22; 8/30/22	Web-based	49
Handbook 133 – Overview of Handbook 133 (3 sessions)	1/27/22; 4/21/22; 8/31/22	Web-based	107
Weights and Measures Inspections – Evidence, Search and Seizure, and Due Process (3 sessions)	1/25/22; 4/20/22; 8/29/22	Web-based	79

LPG (Propane) -Verifying the Net Contents of 20 lb Cylinders (Part 1) (3 sessions)	1/19/22; 4/12/22; 9/7/22	Web-based	155
Legal Metrology Devices			
No training seminars were offered in 2021.	--	--	--

The following includes a summary of training-related activities in each NIST OWM Program along with an update on some of OWM's general work in developing and providing legal metrology training.

Laboratory Metrology and Metric Program

The following summarizes activities in the NIST OWM Laboratory Metrology Program:

General. The Laboratory Metrology Program training classes conducted in 2022 included both virtual and in-person formats, with a total of 28 sessions and 339 students.

Regional Metrology Association Training. All Regional Measurement Assurance Program (RMAP) training was conducted in an in-person format in 2022. The Laboratory Metrology Program found that holding the Regional Measurement Assurance Program (RMAP) training events in person was beneficial and essential in filling training gaps from the last two years of virtual training.

OWM held an abbreviated Fundamentals of Metrology Training at the end of several of the in-person RMAPs in 2022. This training was specially designed for metrologists who took NIST's online Fundamentals Course in 2020 and 2021 and intended to fill the gap between the online course and NIST's regular in-person course.

Laboratory Metrology Program Training in 2022. In-person training events resumed on-campus in 2022 and were very instrumental to many labs being able to have continuity of operations and to continue to serve their State weights and measures programs. All lab metrology in-person seminars and webinars consisted of hands-on application of training material. Class size and other restrictions will continue to be adjusted to comply with local safety conditions and policies, with preference being given to metrologists from state and local weights and measures programs.

Lab Recognition and Workload. OWM currently recognizes 44 state labs as having "Metrological Traceability" according to NIST Handbook 143 (2019). Twenty of those labs are also Accredited by NVLAP. Forty-five labs are applying for "Recognition" this year.

The bi-annual Workload Survey through NCSLI is getting started with data expected to be provided by March 2023.

Metric Program. The Metric Program, which is now located in the Laboratory Metrology Program, conducted five webinars and web-based sessions in 2022. This training covered three different topic areas presented in five sessions and included 48 students.

Laws and Legal Metrology Devices Program

General. The development and delivery of field inspection training in the areas of laws and regulations and legal metrology devices have slowed due to staff shortages and an increased workload for the technical staff. However, OWM hopes to resume work on some of the projects already in progress and to develop more training products and services moving forward.

Webinars. The Laws Program conducted 18 webinars on topics related to "Laws and Regulations" in 2022, this included 6 different topic areas as outlined in the tables above, with 18 sessions and 606 students. These courses were offered on a frequency based on the level of demand, but no less than once per quarter during the year.

No webinars were presented by the Legal Metrology Devices Program in 2022. Several new webinars/courses are in various stages of development:

- Reference Scale Verification for Gravimetric Testing
- Electric Vehicle Fueling Systems Inspection and Testing
- Retail Motor-Fuel Dispensers Inspection and Testing
- Conducting Witness Tests

Informal Learning Resources. OWM plans to expand available “informal learning” tools targeted toward field inspection topics. This includes adding to existing informal learning resources currently offered by NIST such as study guides, examination procedure outlines, field manuals, and videos as well as exploring the development of new tools such as checklists and frequently asked questions to assist in field inspections.

The Laws and Legal Metrology Devices Program had also planned to implement “information hour” informal educational sessions in 2022, patterned after those used in the past by the Laboratory Metrology Program. These sessions will focus on presenting information on a select topic, followed by a question-and-answer session. Topics will be selected from questions OWM has received from officials and other stakeholders on various field inspection issues and new inspection areas in the marketplace. OWM will also solicit ideas from the community on future topics.

Although this work was delayed in 2022 due to the restrictions noted earlier, Rick Harshman and Lisa Warfield are now working on the development of a format and timeline for these sessions and have identified a number of potential topics to address. They expect to begin scheduling the first of these sessions in the late spring or early summer 2023.

General – OWM Training

Mrs. Butcher summarized the following statistics for OWM’s 2021 training as follows:

- 31 classes presented in-person and virtually on topics related to laboratory metrology, metric, and laws and regulations
- 993 total students
- Training included regulators and industry and an increased interest from international participants

Mrs. Butcher provided an overview of OWM’s training looking forward in 2023. She shared that no “in-person” classes are presently being scheduled for field inspection training. OWM will explore options for future classes, which it expects to include a mixture of in-person, hybrid, and virtual training as staffing and conditions permit.

As shared last year in her 2021 report, Mrs. Butcher stated that OWM has no intention of eliminating, virtual training options. OWM has reached a significantly larger number of students with virtual training and students who have never had the opportunity to attend NIST OWM training in the past have been able to access training because of the virtual format. It is clear that virtual training also offers the advantages of flexibility and reduced costs to learners as well as trainers and makes offering multiple sessions of a given course more practical.

OWM plans to expand virtual training to include additional topics on field inspection, particularly on device-related topics and will actively explore “hybrid” and “blended” learning options. This might include options such as:

- Some students attend virtually and some attend in-person;
- Some portions of class are presented in an in-person format (with smaller size classes) and some portions of class are presented virtually (with larger class sizes); and
- Exploring “synchronous” and “asynchronous” formats enhanced with pre-recorded lecture and/or video.

These options will likely continue even after OWM returns to in-person training.

OWM will also be experimenting with available technology and tools to best incorporate elements of “hands-on” in its field inspection training, recognizing the importance of that “hands-on” or “experiential learning” component for field inspection work.

Mrs. Butcher has previously shared plans at NIST to create a “Virtual Training Studio.” She reported this project is well underway with significant monetary and facility support from OWM’s parent operating unit, the Physical Measurement Laboratory. This will include outfitting a virtual training space in NIST OWM offices for delivering virtual training and hosting web-based meetings such as work groups and standards development sessions. This “studio” will result in a mid-level space for:

- Conducting virtual training;
- Conducting live demonstrations;
- Video recording and editing;
- Enhancing livestream capabilities;
- Hosting and/or participating in virtual meetings as individuals or as a group; and
- Enable high levels of interactivity with off-site participants with capability to concurrently, view remote participants.

OWM has purchased considerable equipment and begun work with a contractor to renovate the space. This studio will also enhance OWM’s virtual training events and its capability to develop training videos.

In early 2022, OWM was pleased to add an Audio-Visual Production Specialist (a position that is shared with another NIST division) to its staff to oversee the activities targeted for development in the Virtual Studio project and to further extend OWM’s ability to provide virtual training events as well as enhance both virtual and in-person training. OWM’s new AV specialist, Rich Montgomery, comes to OWM with extensive experience in video development and production and has already developed several short videos for OWM. Mr. Montgomery attended the 2023 NCWM Interim Meeting where he created a video of a technical panel discussion and interviewed attendees to gather footage for a video highlighting attendees’ experience at the conference. OWM training developers are also beginning to take advantage of Mr. Montgomery’s talents and expertise and have started collaborating with him on the development of a couple of short videos focused on field inspection topics.

Mrs. Butcher reported that OWM trainers are actively participating in their own professional development through participation in a variety of training courses and activities focused on enhancing their abilities in training design, development, and delivery, with particular emphasis on virtual and hybrid training venues.

Mrs. Butcher will continue to provide updates to the Committee and NCWM members at future meetings about available OWM training and future training plans. In the meantime, she reminded those interested in OWM training, to periodically consult the OWM Calendar of Events for upcoming training at the following link on the OWM website:

<https://www.nist.gov/pml/weights-and-measures/about-owm/calendar-events>

NIST OWM looks forward to continued work with the weights and measures community to develop and implement training to assist weights and measures officials and service personnel in their continued professional development.

NCWM Meeting Comments:

NCWM 2023 Interim Meeting: During the 2023 Interim Meeting open hearings, an updated presentation was given by Tina Butcher (NIST OWM) on NIST training activity. The updates will appear in Publication 16. Doug Rathbun (IL) wanted to thank NIST for all they do to advance training among the membership. Mahesh Albuquerque (CO) commended the NIST office of W&M for their efforts and is excited about some of the new materials that are being developed. Mahesh looks forward to continuing to work with NIST on training. Ivan Hankins (IA) expressed appreciation for the online material and virtual options that have become available. Jim Pettinato (PDC AMC representative) reminded the body that there are funds available from the AMC designated for assisting jurisdictions in providing training, and can be used to cover costs such as instructor travel, materials, etc. The application can be found on the NCWM website.

2023 Annual Meeting: Tina Butcher (NIST OWM) gave an update on the training programs provided by OWM. She highlighted the work being done to provide more streamlined access to the most relevant and desired OWM educational resources, initially based on data collected from state directors via a survey. This effort will be ongoing and will reflect the needs of the target audience. Cheryl Ayer (NH) expressed excitement about the new options for training being developed by PDC and NIST. She encourages sharing of learning programs, procedures, and practices among state programs and that directors listserv information may be another source of information that could contribute to content of an FAQ.

Regional Association Comments:

CWMA 2023 Interim Meeting: Mike Harrington, Iowa took NIST online classes and found them to be very helpful. Requests more on demand video training. Helpful to justify job class increase.

Steve Peter, Wisconsin, Developing Training videos in Wisconsin. As they move into editing those videos they will be reaching out for feedback. Service agents have been requesting where to find training materials.

Wes Sommerfield, Iowa, took online LP Cylinder training and found it very helpful.

Greg Vanderplaats, Minnesota, NCWM exam have their modules and objectives posted on the NCWM website for each exam and NIST has HB 44 self-study available.

Greg Vanderplaats, Minnesota. Goal for NCWM RSA exam is to have one test that other states may recognize.

The committee recommends this as an informational item.

WWMA 2023 Annual Meeting: WWMA PDC Chair, Miland Kofford (Utah) recognized Dr. Katrice Lippa (NIST OWM) for her update earlier in the meeting introductions and thanked NIST OWM for the presentation.

The committee recommends this as an informational item.

SWMA 2023 Annual Meeting: The PDC heard no comments on this item and recommends the item remain an informational item.

NEWMA 2023 Interim Meeting: During the NEWMA Interim Meeting Ethan Bogren (Westchester Co., NY) the NCWM PDC Chair discussed correspondence sent to the NCWM PDC members by Michael Cleary (California, Retired) that suggested that the NCWM Field Training Manuals be prioritized and catalogued for accessibility. Jason Flint (New Jersey) suggested that the PDC oversee the development of future Field Training Manuals. Mr. Flint suggested subjects for training manuals include automatic bulk weighing systems and multi dimension measuring devices. Several regulators expressed support for the development of more Field Training Manuals. Cheryl Ayer (New Hampshire) noted that the manuals are live digital documents that can be edited by NCWM when necessary.

The committee recommends this as an informational item.

EDU-3 I Instructor Improvement

The Committee has reiterated multiple times in the past that the responsibility for the training employee rests with individual organizations (weights and measures jurisdictions and industry alike). While NIST and other training providers offer excellent sources of training and training materials, organizations must develop and manage their own training programs, including developing trainers; establishing individual development plans for employees; and identifying strategies for continually assessing and responding to training needs. The Committee recognizes that NIST OWM cannot possibly train all weights and measures inspectors in the country. The state and municipal jurisdictions have ultimate responsibility for training and qualifying their personnel. To fulfill this responsibility, jurisdictions should be making individual plans to maintain or bolster their training efforts. NIST OWM should be viewed as one vital resource to support that effort. The Professional Development Committee is another resource. The Committee has created and posted on its website, the “Body of Knowledge” to establish uniform learning objectives for weights and measures professionals. In addition, the Committee has posted a Model Field Training Program document on its

website. This program outlines methods to evaluate and document training and offers guidance on training new inspectors and taking steps to ensure their ongoing development.

NIST OWM has also provided ongoing contributions to assist the community in the development of instructors. OWM has provided legal metrology training for weights and measures jurisdictions and industry for many years but does not have the resources to respond to the numerous training requests it receives. OWM has long recognized that there are many individuals with extensive legal metrology experience who have the skills needed to provide this type of training. OWM hopes to continue to draw from this pool to develop trainers who can present schools with NIST, thus leveraging NIST resources; providing more timely classes; and providing a way to more broadly share the valuable expertise these individuals possess. In the past ten years, NIST OWM has taken on more field inspection classes than it would otherwise be able to do because of the co-instructors drawn from its current pool of trainers.

Mrs. Tina Butcher (NIST OWM) has regularly updated the Committee on instructor development work by NIST OWM.

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:

NCWM 2023 Interim Meeting: No comments were heard from the floor. Mrs. Tina Butcher, NIST OWM, reported that OWM has not undertaken any new work in this area in 2022. As reported in the past few years, Mrs. Butcher emphasized that OWM sincerely appreciates the time and resources committed by these trainers and their organizations in support of this important partnership and the expertise that these trainers bring to NIST training events and looks forward to continued collaboration. OWM will continue to provide the Committee with updates on its progress as well as continue to collaborate with and support the Committee in its work.

2023 Annual Meeting: Tina Butcher (NIST OWM) gave a brief update on this item; the topic of 'blended' training programs which use a blend of training delivery methods, e.g., combining virtual training mechanisms such as instructor-led webinars, on demand or self-study with in-person hands-on content. This may also be a path to revive the 'training the trainer' initiative and grow outreach. Kurt Floren (LA County, CA) stood to express appreciation for Tina's commitment, effort and constant drive to improve our community and people and recognized the value of her contributions, and wished her well in retirement. Tina received a standing ovation for her contributions to NCWM throughout her career at NIST OWM.

Regional Association Comments:

CWMA 2023 Interim Meeting: No Comments

The committee recommends this as an informational item.

WWMA 2023 Annual Meeting: David Aguayo (San Luis Obispo County, CA) – Appreciates and supports efforts for online training that provides consistency with current staff turnover rates.

Kevin Schnepf (Division of Measurement Standards, CA) – Appreciates the challenge to find qualified trainers for NIST training. Recommends focusing on identifying SMEs as trainers in regions and develop talent.

Miland Kofford (UT) – Appreciates NIST for online training. Recognizes jurisdictions are responsible for training but appreciates the help and guidance from NIST.

The committee recommends this as an informational item.

SWMA 2023 Annual Meeting: The PDC heard no comments on this item and recommends the item remain an informational item.

NEWMA 2023 Interim Meeting: During the 2023 NEWMA Interim Meeting Cheryl Ayer (New Hampshire) suggested that NIST Web based training sessions be more accessible. Ms. Ayer cited an instance where she became aware of an upcoming webinar she thought would be of benefit to a member of her staff, however the inspector could not participate because the registration had closed. Ms. Ayer suggested that Webinars be recorded and then made available for review for those that were not able to participate or for future reference. Marc Paquette (Vermont) suggested a Train the Trainer type program for metrologists.

The committee recommends this as an informational item.

EDU-4 I Recommended Topics for Conference Training

The Board of Directors has charged the Committee with recommending appropriate topics for the technical sessions at future annual meetings. The Board of Directors asks the PDC to review and prioritize possible presentation topics and to submit those to the NCWM Chairman. The Chairman will coordinate with NCWM staff to secure presenters.

The following is a list of technical presentations made at the NCWM since 2009. Presentations given since 2010 are available at www.ncwm.com/annual-archive.

- Planning and Coordinating a National Market Place Survey (Ms. Rachelle Miller, WI, 2017)
- The Life Cycle of Petroleum from Well to Retail (Mr. Prentiss Searles, API 2017)
- The United States Mint at Denver – Gold, Coins and Embezzlement (Mr. Thomas Fesing, 2016)
- Understanding Transportation Network Systems (Ms. Andrea Ambrose Lobato, Lyft and Mr. Bob O' Leary, Uber 2016)
- Regulatory Consideration for Legalized Marijuana (Ms. Julie Quinn, MN, and Mr. Nick Brechun, CO, 2016)
- Motor Oil Quality Violations (Mr. Tom Glenn, Petroleum Quality Institute of America, 2014)
- Making Sense of Electronic Receipts (Mr. Justin Hotard, Vice President and General Manager, NCR Corporation, 2014)
- LNG & CNG Motor Fuel – A Technical Briefing from Industry (Mr. Doug Horne, President CVEF, Mr. Zack Wester, Blu, Mr. Jeff Clarke, NGVA, 2014)
- Taximeter Technology Advancements (Mr. Matt Daus, International Association of Transportation Regulators, 2013)
- Advanced Vehicles and Fuel Quality (Mr. John M Cabaniss, Jr., Association of Global Automakers, 2013)
- Economic Justification and Demonstrating Value of Weights and Measures (Mr. Tim Chesser, Arkansas Bureau of Standards, 2012)
- Conducting Effective Marketplace Surveys and Investigations (Ms. Judy Cardin, Wisconsin Weights and Measures, 2012)
- Public Relations and Customer Service as Regulators (Mr. Doug Deiman, Alaska Division of Measurement Standards/CVE, 2012)
- An Overview of Unit Pricing in the United States (Mr. David Sefcik, NIST OWM, 2011)
- Grocery Unit Pricing in Australia (Mr. Ian Jarratt, Queensland Consumers Association, 2011)
- Grocery Unit Pricing in Canada (Mr. Ian Jarratt, Queensland Consumers Association, 2011)
- The U.S. Hydrogen Measuring System: The Turning Point? (Ms. Kristin Macey, California Division of Measurement Standards, 2011)
- Corrosion in Ultra Low Sulfur Diesel Underground Storage Systems (Mr. Prentiss Searles and Ms. Lorri Gainawi, American Petroleum Institute, 2010)
- Risk-Based Inspection Schemes (Mr. Henry Oppermann, Weights and Measures Consulting, LLC, 2010)
- Diesel Exhaust Fluid (DEF) (Mr. Gordon Johnson, Gilbarco, Inc., and Mr. Randy Moses, Wayne, 2009)
- Fuel Volatility and Ethanol Blending (Mr. Jim McGetrick, BP Products, 2009)
- Investigative Techniques (Mr. Michael Cleary, Retired, 2009)

At the Interim Meeting 2019 the following suggestions from the floor for additional topics were received:

- Investigative reporting

- D.E.F. Testing requirements, special considerations (handling, safety, equipment)
- Differentiation between weight classifier and normal rounding scales
- Organizing/publishing existing training materials

NCWM Meeting Comments:

NCWM 2023 Interim Meeting: No comments were heard from the floor.

2023 Annual Meeting: Ethan Bogren (Westchester County, NY) gave a quick update on the topic of conference training. Doug Rathbun (IL) mentioned a successful school and safety training initiatives. Ivan Hankins (IA) pointed out the LPG study as a success from the training perspective. The study provided a forum to communicate the issues discovered and how to overcome them. He also thanked David Sefcik (NIST OWM) for the training provided in conjunction with this study.

Regional Association Comments:

CWMA 2023 Interim Meeting: Mike Harrington, Iowa, wants to continue having professional development programs at conferences. This helps with justification for expense of going to conferences.

The committee recommends this as an informational item.

WWMA 2023 Annual Meeting: Kurt Floren (Los Angeles County, CA) – Recommends comprehensive e-commerce training. He commented on the need for uniform training to avoid possible inconsistencies. Consistency will be critical in regulating this marketplace.

Mahesh Albuquerque (Division of Oil and Public Safety, CO) – BOD discussed training for future regional meetings. Reach out to Roxanne Chepsongol (NM) or anyone on the BOD with recommended training topics.

Matt Douglas (Division of Measurement Standards, CA) - Recommends training on the Roberts Rule of Order. He feels it would be beneficial to the committees. He also believes a training portion for committee chairs would help them know their boundaries. What questions they can ask and what their role is.

The committee recommends this as an informational item.

SWMA 2023 Annual Meeting: The PDC heard no comments on this item and recommends the item remain an informational item.

NEWMA 2023 Interim Meeting: During the 2023 NEWMA Interim Meeting Cheryl Ayer (New Hampshire) suggested gravimetric testing procedures for bulk motor oils as a training topic. Jason Flint (New Jersey) agreed with Ms. Ayer and suggested that gravimetric testing procedures could also be applied to DEF. Several other regulators agreed that conference training on gravimetric testing procedures for motor oil and DEF is needed.

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.newwm.com/safety as a place for states to share information and resources to help them address each of the major steps in creating and maintaining an effective safety program.

In July 2017, the Board of Directors created the Safety Task Group to create a safety tool kit to help weights and measures organizations create or improve their own safety programs. The toolkit is complete and is posted on the NCWM website at www.ncwm.com/safety.

At the 2018 Annual Meeting, the NCWM BOD decided to make the task group a permanent subcommittee associated with the PDC. The newly formed Safety Subcommittee will assume responsibility for:

- Maintaining and updating the safety toolkit.
- Writing and deploying the NCWM annual safety survey, as well as reporting on the results each year.
- Finding resources and/or developing weights-and-measures-focused materials relating to the top hazards identified through the safety survey or through developing the toolkit.
- Building a safety culture and developing safety leadership within the NCWM through participation on the Safety Subcommittee

The Safety Subcommittee is currently working to improve the annual safety survey by:

- Including questions about near-miss incidents and about incidents resulting in lost or restricted time over multiple years.
- Contacting counties and associate members to increase participation.
- Writing an instruction guide to help participants gather information they need before completing the survey.

The Committee expresses appreciation to the members of the Safety Subcommittee for their willingness to volunteer for this important work.

Safety Subcommittee Members		
Chair	John Bell	Missouri
Public Sector	Jason Flint	New Jersey
Private Sector	Tisha Arriaga	Marathon Petroleum, LLC
Private Sector	Bill Callaway	Crompton
Private Sector	Remy Cano	Northwest Tank & Environmental Services
Private Sector	Robert LaGasse	Mulch and Soil Council

The NCWM safety page houses the list of regional safety liaisons and an archive of past safety articles.

Regional Safety Liaisons:

Central Weights and Measures Association (CWMA)

Mr. John Bell, Missouri Department of Agriculture

Northeastern Weights and Measures Association (NEWMA)

Mr. Michael Peeler, New Jersey Weights and Measures

Southern Weights and Measures Association (SWMA)

Mr. Robert Huff, Delaware Department of Agriculture

Western Weights and Measures Association (WWMA)

Mr. Remy Cano, Northwest Tank & Environmental Services

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 2023)	NEWMA	April 15, 2023
Issue 3 (September 2023)	CWMA	August 13, 2023
Issue 1 (February 2024)	WWMA	January 15, 2024
Issue 2 (May 2024)	SWMA	April 15, 2024

- 1
- 2 The Committee would like to thank the following individuals for their contributions since the 2020 Annual Meeting:
- 3 • *The Psychology of Safety* – Mr. Ron Armstrong (NWTES)
- 4 • *Back to Your Health* – Ms. Elizabeth Koncki (MD)
- 5 • *Engineering Controls* – Mr. Mike Sikula (NY)
- 6 • *Avoid Hostile Encounters in the Field* – Mr. Mike Sikula (NY)
- 7 • *Who's Got Your Back?* – Mr. Ron Armstrong (NWTES)
- 8 • *Cannabis Facility Safety Awareness* – Mr. John Bell (MO)
- 9 **NCWM Meeting Comments:**
- 10 NCWM 2023 Interim Meeting: No comments were heard from the floor.
- 11 **2023 Annual Meeting: Paul Floyd (LA) gave a brief overview on the Safety Committee status. No comments**
- 12 **were heard during the open hearing.**
- 13 **Regional Association Comments:**
- 14 CWMA 2023 Interim Meeting: No Comments
- 15 The committee recommends this as an informational item.
- 16 WWMA 2023 Annual Meeting: Kevin Schnepp (Division of Measurement Standards, CA) – Recommends EVFS
- 17 safety training.
- 18 David Aguayo (San Luis Obispo County, CA) – With staffing changes, the safety page on the NCWM site is utilized
- 19 often. Supports a regular safety newsletter or updates. Recommends a new NCWM safety survey with published
- 20 results.
- 21 David Sefcik (NIST OWM) – Suggests WWMA partner with industry to ask for safety training and guidance at the
- 22 session on Wednesday (September 20, 2023).
- 23 The committee recommends this as an informational item.
- 24 SWMA 2023 Annual Meeting: The PDC heard no comments on this item and recommends the item remain an
- 25 informational item.
- 26 NEWMA 2023 Interim Meeting: During the 2023 NEWMA Interim Meeting Jason Flint (New Jersey) recommended
- 27 that NEWMA Safety Liaison Mike Peeler (New Jersey) replace him on the NCWM Safety Subcommittee. Jim Willis
- 28 (New York) commented that he would like to see a repository to document accidents and safety issues. These shared
- 29 experiences will help promote a culture of safety awareness. Cheryl Ayer (New Hampshire) noted that since Julie
- 30 Quinn (Minnesota, Retired) completed her tenure as chair of the Safety Subcommittee the committee has not
- 31 conducted any safety surveys. This information was found to be useful in targeting areas of need related to safety
- 32 awareness. In addition Ms. Ayer suggested a repository of safety resources be compiled. She noted that on the
- 33 NCWM website OSHA is the only resource currently listed.
- 34 The committee recommends this as an informational item.

PMT-2 I Skimmer Education Task Group

This is a new agenda item added to the report by the PDC after the Publication 15 printing deadline.

The Skimmer Education Task Group (SETG) held its first meeting during the 2021 Annual Meeting. The SETG is made up of industry members, regulatory officials, and interested parties for the purpose of continuing work identified by the S&T Committee's Credit Card Skimmer Task Group. Under the guidance of the Professional Development Committee (PDC), the task group will develop education and outreach strategies and gather or produce materials to educate regulatory officials, fuel retailers, industry members and consumers on payment card information theft via skimming devices. The SETG will provide information and organize education sessions to share recommendations for safety procedures and technologies to better protect consumer payment information and reduce the risk of skimmer installation at fuel dispensers. The SETG will continue in force until the task group Chair and the PDC Chair agree the work has been completed. The task group may also be disbanded by vote of the NCWM Board of Directors. The task group will meet via electronic media, teleconferences, face-to-face meetings, or other means available.

Co-Chair, Ms. Paige Anderson (NACS) provided a report of their meeting held on January 10, 2021 during the open hearing. Following is a summary of her remarks.

The SETG expressed their appreciation for the leadership and assistance of Mr. Hal Prince (FL), the NCWM board and staff, Mr. David Aguayo (San Luis Obispo Co., CA) and the PDC in helping to create the Task Group. Many of the Task Group members worked on the policy item before the Specifications and Tolerances (S&T) Committee to establish user requirements on fuel dispensers to prevent skimming, and during that time recognized the importance of education and training.

The SETG's mission to educate the membership and bring together all stakeholders in sharing information on skimming. The SETG recognizes that technology changes include the devices used to steal debit and credit card information, the technology to prevent these thefts, and the criminals become more organized and sophisticated. NCWM provides a powerful platform to bring together all stakeholders – state officials, law enforcement, manufacturers, service companies, retailers, security providers and consumers.

In organizing the SETG, it was decided that having co-chairs representing both regulatory officials and the private sector demonstrates partnership in combatting skimming and the criminal organizations.

The SETG held their first meeting on Sunday, January 10th, 2021 via web conference. The number of attendees who attended the meeting was remarkable. It clearly demonstrated that there is a significant need for knowledge on this issue. The SETG discussed and finalized their 2021 goals. The two goals are to:

1. Establish a library of resources for the public on the NCWM website. The resources will consist of videos, articles, reports, checklists, contact information, best practices, and other information. The SETG recognized that there may be some sensitive or proprietary data that should not be put on the public-facing website but may be shared with the membership or a targeted group of the membership. Alternative distribution methods would be determined and used in these cases. Communicating the availability and location of these resources to the membership and beyond is an important element of the strategy and project.
2. Host presentations and briefings from subject matter experts at future NCWM meetings. The SETG is planning to provide such a briefing at the Annual meeting in July 2021. The SETG is looking at 3 key constituencies to provide presentations:
 - o Law enforcement - overview of the landscape of activity on skimming (e.g., U.S. Secret Service)
 - o Private sector security experts - to share what they are seeing and describe the types of technology being used by the criminals and methods used to combat skimming
 - o Retail/industry - updates on the transition to EMV card readers, etc.

The SETG is also working to identify other key stakeholders to either present or to join the SETG. These key stakeholders included financial institutions such as banks, credit card providers, and credit unions.

- 1 The SETG welcomes volunteers and encourages participation from all members. If you or your staff are interested,
2 contact members of the PDC or the NCWM staff.

Skimmer Education Task Group Members		
Co-Chair	Vacant	
Co-Chair	Vacant	
Public Sector	Bobby Fletcher	Louisiana
Public Sector	John Larkin	California
Public Sector	Mike Harrington	Iowa
Public Sector	Vince Wolpert	Arizona
Public Sector	Scott Borse	PEI
Public Sector	Owen Dewitt	FlintLoc Technologies, LLC
Public Sector	Brent Price	Gilbarco, Inc.
Public Sector	Mike Roach	Invenco Payment Systems
Public Sector	Scott Schober	Berkley Varitronics Systems

3 NCWM Meeting Comments:

- 4 NCWM 2023 Interim Meeting: No comments were heard from the floor.

5 2023 Annual Meeting: The PDC Chair pointed out that the task group has been idle of late primarily due to lack of
6 leadership (chairperson position is vacant); the question was asked if this task group should be disbanded. Kurt Floren
7 (LA County, CA) mentioned that the scope of 'skimmers' is broader now, and includes theft of EBT benefits using
8 skimmers on POS systems in all markets. The issue may not be as prevalent at RMFDs specifically, but it is still a
9 concern. Stephen Benjamin (NC) would like to see continuation and communication on this topic. Vince Wolpert
10 (AZ) suggested we expand the scope of the task group to consider ways to identify/prevent facilitation of fraud by
11 other means as well. This sentiment was echoed by Matt Douglas (CA), who also noted that they have seen an increase
12 in fraud via altered meter pulse transmissions. The PDC believes there is value in maintaining this task group and is
13 looking for a volunteer to lead the group in continuation of this work, and would also ask the Conference to consider
14 expanding the scope of the task group to include some of these other sources of fraud identified by the membership.

15 Regional Association Comments:

- 16 CWMA 2023 Interim Meeting: Brenda Geist, Kansas, Kansas does not want to see this task group disbanded. States
17 need to be proactive on skimmers.

18 Mike Harrington, Iowa, Skimmer Education Task Group needs a chair. Anyone interested can let Mike Harrington
19 know and he will pass it on to the Task Group.

20 The committee recommends this as an informational item.

- 21 WWMA 2023 Annual Meeting: Matt Douglas (Division of Measurement Standards, CA) – Supports and appreciates
22 the Task Group, recommends adding pulser technology and include other devices that facilitate fraud.

23 Gene Robertson (NCWM Chair) – Named Alan Walker (FL) as co-chair of Task Group and suggests name change to
24 include more types of fraud activities.

25 Vince Wolpert (AZ) – Arizona recently saw pulser and multiple skimmer devices causing losses over \$3,000. The
26 technology is advancing, and AZ is seeing different designs. Supports expanding the group to include all types of
27 fraud.

28 Kevin Schnepf (Division of Measurement Standards, CA) – Echoes Vince Wolpert's comments and recommends
29 name change to "Fraud Prevention Task Group".

30 Kurt Floren (Los Angeles County, CA) – Reiterates NCWM Annual Conference comments about EBT and WIC
31 benefit thefts growing in LA County and more USDA money is being stolen. Thefts of government benefits have

1 gone from hundreds of thousands to hundreds of millions of dollars. This will eventually affect state Departments of
2 Agriculture budgets. Taking on this issue may help secure funding from USDA and other federal programs to support
3 fraud prevention and investigation. Suggests continuing to pursue the issue.

4 The committee recommends this as an informational item.

5 SWMA 2023 Annual Meeting: Alan Walker (FL) has volunteered to Chair the Skimmer Education Task Group. The
6 PDC recommends continuing the Skimmer Education Task Group and look forward to the work they are doing.

7 NEWMA 2023 Interim Meeting: During the 2023 NEWMA Interim Meeting Jimmy Cassidy (Massachusetts)
8 suggested that the scope of work of the TG be expanded to include other types of fraud. It was suggested that the TG
9 begin to look at instances of fraud involving other devices as well as RMFD. Several other regulators commented on
10 the need to keep the TG active, and agreed that expanding the scope of work should be considered.

11 The committee recommends this as an informational item.

12 Mr. Ethan Bogren, Westchester County, New York | Committee Chair
13 Ms. Valerie Forbes, Delaware | Vice Chair
14 Mr. Scott Simmons, Colorado | Member
15 Mr. Brian Terry, Arkansas | Member
16 Ms. Sherry Turvey, Kansas | Member
17 Mr. Perry Lawton, TESCO | AMC Representative
18 Mr. John Bell, Missouri | Safety Liaison
19 Ms. Tina Butcher, NIST, OWM | NIST Liaison
20 Mr. Jerry Buendel, Retired | Certification Coordinator

21 **Professional Development Committee**

Appendix A

Summary of NIST OWM Training Conducted in 2021

(PDC Agenda Item EDU-2)

Summary of NIST OWM Training Conducted in 2021			
Area/Course Name	Start Date	Location	No. of Students
Laboratory Metrology			
Fundamentals of Metrology & LAP Problems Preparation	1/12/21 & 5/11/21	Web-based	6
Regional Measurement Assurance Programs			
MidMAP	10/24/21	Web-based	25
NEMAP	08/02/21	Web-based	21
SEMAP	03/22/21	Web-based	32
SWAP	08/30/21	Web-based	25
WRAP	05/03/21	Web-based	22
Webinars			
Basic Uncertainty Concepts	05/20/21	Web-based	8
Contract Review	03/11/21	Web-based	8
Contract Review	07/29/21	Web-based	5
Document Control and Record Keeping	03/04/21	Web-based	10
Document Control and Record Keeping	07/22/21	Web-based	6
Info Hour – Assessing Field Standards for Calibration & Use (3 sessions: 6/22/21; 9/21/21; & 11/9/21)	06/22/21	Web-based	172
Software Verification & Validation	06/10/21	Web-based	9
State Laboratory Annual Submission Process	07/01/21	Web-based	58
Laws and Metric Program			
Packaging & Price Verification			
Handbook 130 – Examination Procedure for Price Verification 5 Sessions: 1/21/2021; 2/16/2021; 4/14/2021; 7/14/2021; 10/1/2021	5 Sessions Jan to Oct 2021	Web-based	Total 178
Handbook 130 – Overview of the Uniform Packaging and Labeling Regulation 4 Sessions: 2/17/2021; 4/15/2021; 7/15/2021; 10/7/2021	4 Sessions Feb to Oct 2021	Web-based	Total 156
Handbook 133 – How to Test Animal Bedding 4 Sessions: 2/24/2021; 4/28/2021; 7/13/2021; 10/20/2021	4 Sessions Feb to Oct 2021	Web-based	Total 71
Handbook 133 – Overview of Handbook 133 5 Sessions: 2/18/2021; 4/19/2021; 7/27/2021; 8/26/2021; 10/14/2021	5 Sessions Feb to Oct 2021	Web-based	195
Weights and Measures Inspections – Evidence, Search and Seizure, and Due Process 5 Sessions: 1/26/2021; 2/23/2021; 4/22/2021; 7/1/2021; 10/26/2021	5 Sessions Jan to Oct 2021	Web-based	Total 183
LPG (Propane) -Verifying the Net Contents of 20 lb Cylinders (Part 1) - NEW 4 Sessions: 6/30/2021; 7/26/2021; 8/24/2021; 10/21/2021	4 Sessions Jun to Oct 2021	Web-based	Total 338
Metric Education			
Info Session – Metric Education Resources	05/22/21	Web-based	5

	09/11/21	Web-based	4
	09/29/21	Web-based	6
Info Session – Metric Estimation	08/14/21	Web-based	6
	09/15/21	Web-based	3
Measurement System Basics – SI and US Customary Units for Regulatory Officials	08/26/21	Webinar	23
Legal Metrology Devices			
No training seminars were offered in 2021.	--	--	--

Appendix B

NIST OWM Training: Future Plans – Updated Information (PDC Agenda Item EDU-2)

No current commitments to in-person training for 2021

- All in person field inspection classes postponed until further notice

Training in FY 2022

- Travel restrictions may lift later this summer
- Continuing to assess as the situation unfolds
 - Local pandemic restrictions
 - Travel restrictions for training staff and students
- Unclear how pandemic related restrictions will affect NIST OWM's future in-person training for all programs
 - Impact of social distancing requirements on classroom size, configuration, and ability to present to groups of students
- Lab Metrology Program closely watching NIST OWM policies regarding hosting events in-person

Training Going Forward

- Will continue to offer virtual training
- Plan to expand available virtual training topics
- Experimenting with available technology and tools to best incorporate elements of “hands on” in-field inspection training

Virtual Training Space

- Significant progress on outfitting a virtual training space at NIST for OWM's use in delivering virtual training
 - Small group within OWM has been working with their NIST staff to plan this effort
 - Space has been allocated and equipment purchases are in progress
 - Significant support from the Physical Measurement Laboratory (OWM's larger operating unit)
 - Looking forward to beginning work on this space

OWM Trainers

- Participating in a variety of training courses as part of their professional development
 - Virtual training design, development, and delivery

Considering Development of Hybrid Courses

- For uses during and after pandemic
- Virtual sessions coupled with hands-on sessions using virtual technology and/or local on-site trainers to help facilitate

See OWM Calendar of Events for Upcoming Training

- www.nist.gov/newsevents/upcomingevents/org/6436
- Note: A series of three new webinars planned on the topic of LPG Cylinder Refilling
 - LPG (Propane) – Verifying the Net Contents of 20 lb Cylinders (Part 1)” already in progress with several upcoming sessions

National Type Evaluation Program (NTEP) Committee 2024 Interim Meeting Agenda

Mr. Mahesh Albuquerque, Committee Chair
Colorado

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 National Conference 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 conference. 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
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Table B
Glossary of Acronyms and Terms

Acronym	Term	Acronym	Term
CC	Certificate of Conformance	NCWM	National Conference on Weights and Measures
CIML	International Committee of Legal Metrology	NIST	National Institute of Standards and Technology
DoMC	Declaration of Mutual Confidence	NTEP	National Type Evaluation Program
IV	Initial Verification	OIML	International Organization of Legal Metrology
MAA	Mutual Acceptance Arrangement	OIML-CS	International Organization of Legal Metrology – Certificate System
MC	Measurement Canada	OWM	Office of Weights and Measures
MDMD	Multiple Dimension Measuring Devices	R	Recommendation
MRA	Mutual Recognition Arrangement	VCAP	Verification Conformity Assessment Program

Details of All Items
(In order by Reference Key)

INT – INTERNATIONAL

INT-1 I Mutual Recognition Arrangement (MRA)

The MRA between Measurement Canada (MC) and NTEP labs originated April 1, 1994. Since that time, the original MRA has expanded, and a second MRA covering measuring devices was developed. On Tuesday July 26, 2016, NCWM Chairman Jerry Buendel and Measurement Canada President Alan Johnston signed a renewal MRA that provides for continued cooperation between the two organizations and continuation of the beneficial partnership. The new MRA will be effective for 5 years.

The scope of the current MRA includes:

- gasoline and diesel dispensers;
- high-speed dispensers;
- gasoline and diesel meters intended to be used in fuel dispensers and truck refuelers;
- electronic computing and non-computing bench, counter, floor, and platform scales with a capacity up to 1000 kg (2000 lb);
- weighing/load receiving elements with a capacity of up to 1000 kg (2000 lb);
- electronic weight indicating elements (except those that are software based, i.e., programmed by downloading parameters); and
- mechanical scales up to 10 000 kg (20 000 lb).

MC, NTEP, and all our mutual stakeholders agree that the MRA is a benefit for the North American weights and measures industry. The NTEP Committee appreciates the efforts and cooperation of Measurement Canada and is working with MC to continue the cooperative arrangement.

The current agreement expires on July 26, 2026.

22 **INT-2 I OIML-Certification System (CS)**

23 Implementation of the (new) International Organization of Legal Metrology – Certification System (OIML-CS)
24 officially began in January 2018, replacing the previous OIML MAA and basic certificate systems. NCWM signed
25 the OIML MAA Declaration of Mutual Confidence (DoMC) for Recommendation (R) 60 “Load Cells” as a Utilizing
26 Participant in 2006 and NCWM signed the OIML-CS Utilizer Declaration for R 60 in January 2018. A Utilizer is a
27 participant in the system that does not issue any OIML Certificates of Conformance (CC) or OIML Test Reports but
28 does utilize the reports issued by OIML-CS Issuing Authorities and Authorized Testing Laboratories.

29 Dr. Ehrlich serves on the Management Committee of the OIML-CS, and Mr. Flocken serves on the OIML-CS Review
30 Committee. The US (NTEP) supports the OIML-CS process and has agreed to continue accepting OIML-CS R 60
31 test data for load cells with the provision that any use of manufacturer test data is clearly identified on the test report
32 section of the certificate because NTEP cannot use manufacturer test data towards issuance of an NTEP certificate.
33 The OIML-CS criteria aligns with the NTEP Committee's recommendations, and the instructions provided by the NCWM
34 Board of Directors.

35 Dr. Ehrlich has requested, on multiple occasions, that NCWM review its policy regarding participation in the OIML-
36 CS (and previously participation in the OIML-MAA) for R76 (Non-Automatic Weighing Instruments). The NCWM
37 has continued to follow a policy that was established in 2006 to not participate in R76 until NCWM can do so as an
38 Issuing Authority. In 2016, the Board revisited the 2006 discussions leading to that decision, including considerations
39 for NTEP labs’ workload, potential lost expertise, concerns with quality of evaluations at some foreign labs, etc. Since
40 there were no new developments to affect its decision, the NCWM Board of Directors agreed to maintain existing
41 policy. Dr. Ehrlich suggested that if there was no possibility in sight that the NCWM could become an Issuing
42 Authority, then it should consider becoming a Utilizer for OIML R76 under the OIML-CS. Some U.S. manufacturers
43 support current NCWM policy on this, but others would prefer a change.

44 The OIML-CS now includes 39 categories of measuring instruments under what is called “Scheme A”, where
45 accreditation or peer review is required of the Issuing Authority and its Test Labs. In addition to R60 and R76, some
46 the instruments and systems in the OIML-CS that are probably of the most interest to NCWM members include:
47 OIML R21 (Taximeters), R46 (Active Electrical Energy Meters), R49 (Water meters), R51 (Automatic catch-
48 weighers), R59 (Moisture meters for cereal grains and oilseeds), R61 (Automatic gravimetric filling instruments), R85
49 (Level gauges for stationary storage tanks), R106 (Automatic rail-weighbridges), R117 (fuel dispensers and other
50 liquid flow systems), OIML R129 (Multi-dimensional measuring instruments), and R137 (Gas meters).

51 Information regarding the OIML-CS can be found at www.oiml.org. Dr. Ehrlich represents the U.S. interests in this
52 work and regularly provides updates to the NCWM Board of Directors on these activities.

53 **ACT – ACTIVITY REPORTS**

54 **ACT-1 I NTEP Participating Laboratories and Evaluations Reports**

55 The NTEP 2023 laboratories/evaluators meeting was held on March 28th thru the 30th in Cleveland, OH.

56 NTEP continues to routinely survey customers pertaining to NTEP administration and laboratories customer service.
57 The survey is released to active Certificate of Conformance (CC) holders. The NCWM Board of Directors routinely
58 reviews the results of the survey to form a continuous improvement plan for NTEP. With any survey, the challenge
59 is to develop a document that is concise enough that customers will respond, while also providing a meaningful set of
60 data. To date, the NCWM Board of Directors is finding general approval of NTEP services.

61 The Committee reviewed NTEP statistics through September 2022. The review of statistics shows that incoming
62 applications are had increased over previous years creating a manageable but increased evaluation backlog. While the
63 backlog is larger than in previous years, the application processing, evaluation times, and certificate issuing is
64 consistent with previous years. See Appendix A for NTEP statistics.

65 **ACT-2 I NTEP Sector Reports**

66 All NTEP Sector Reports are available to members at the time *NCWM Publication 15* is published. The NTEP
 67 Committee is committed to ensuring electronic versions of sector reports are available with *NCWM Publication 15*.
 68 Please note the sector summary reports will only be available in the electronic version of *NCWM Publication 15* and
 69 at www.ncwm.com/interim-archive; they will not be available in printed versions of *NCWM Publication 15*.

70 **NTEP Weighing/Belt-Conveyor Scale Sector:**

71 The NTEP Weighing/Belt-Conveyor Scale Sector met on August 22-23, 2023, at the Hyatt Place Downtown in Austin,
 72 Texas. The next meeting is scheduled for August 20-21, 2024, at a location to be determined. Refer to the Sectors web
 73 page for additional detail. For questions on the status of sector work or to propose items for a future meeting, please
 74 contact either of the sectors Co-Chair and/or the NTEP Administrator:

Sector Co-Chair

Ms. Jessica Ferree
 Metter-Toledo, LLC
jessica.ferree@mt.com

Sector Co-Chair

Mr. Peter Sirrico
 Thayer / Hyer Industries
psirrico@thayerscale.com

NTEP Administrator

Mr. Darrell Flocken
 Ph: 614-620-6134
darrell.flocken@ncwm.com

75 **NTEP Grain Moisture Meter and NIR Protein Analyzer Sectors:**

76 The Grain Moisture Meter and NIR Protein Analyzer Sectors met on August 9, 2023, at the Holiday Inn Express
 77 Kansas City Airport in Kansas City, MO. Refer to the Sectors web page for a copy of the meeting summary. The 2024
 78 meeting is tentatively scheduled for Tuesday, August 13, 2024. Location to be determined. For questions on the status
 79 of sector work or to propose items for a future meeting, please contact the sector Chair and/or the NTEP Administrator:

Sector Chair

Mr. Karl Cunningham
 Illinois
karl.cunningham@illinois.gov

NTEP Administrator

Mr. Darrell Flocken
 Ph: 614-620-6134
darrell.flocken@ncwm.com

80 **NTEP Measuring Sector:**

81 A join meeting of the Measuring and Software Sector was held on September 19-20, 2023, at the Drury Plaza Hotel
 82 Milwaukee Downtown, Milwaukee, Wisconsin. The 2024 Measuring Sector Meeting is scheduled for September 17-
 83 18, 2024. Location to be determined. Refer to the Sectors web page for additional detail. For questions on the status
 84 of sector work or to propose items for a future meeting, please contact the sector Chair and/or the NTEP Administrator:

Sector Chair

Mr. Michael Keilty
 Endress + Hauser Flowtec AG, USA
michael.keilty@us.endress.com

NTEP Administrator

Mr. Darrell Flocken
 Ph: 614-620-6134
darrell.flocken@ncwm.com

85 **NTEP Software Sector:**

86 A join meeting of the Software and Measuring Sector was held on September 19-20, 2023, at the Drury Plaza Hotel
 87 Milwaukee Downtown, Milwaukee, Wisconsin. The next meeting for the Software Sector is scheduled in conjunction
 88 with the Grain Analyzer Sector Meeting in Kansas City on August 13 and 14, 2023 at a hotel to be determined. Refer
 89 to the Sectors web page for additional detail. For questions on the status of sector work or to propose items for a future
 90 meeting, please contact the sector Chair and/or the NTEP Administrator:

Sector Chair

Mr. James Pettinato

Technip FMC

jim.pettinato@technipfmc.com

NTEP Administrator

Mr. Darrell Flocken

Ph: 614-620-6134

darrell.flocken@ncwm.com

91 **NTEP Multiple Dimension Measuring Devices (MDMD) Work Group:**

92 The NTEP MDMD Work Group meeting was held on May 3-4, 2023, at the Ohio Agriculture Complex - Admin
93 Building, Reynoldsburg, OH. The next meeting is scheduled for May 1, 2024. Refer to the Sectors web page for
94 additional detail. For questions on the status of work group or to propose items for a future meeting, please contact
95 the sector Chair and/or the NTEP Administrator:

Sector Chair

Mr. Chris Senneff

Avery Weigh-Tronix

csenneff@awtx-itw.com

NTEP Administrator

Mr. Darrell Flocken

Ph: 614-620-6134

darrell.flocken@ncwm.com

96 **NTEP Electric Vehicle Supply Equipment (EVSE) Work Group:**

97 The NTEP EVSE Work Group has not met in the previous 2.5 years. At the conclusion of the NCWM Annual Meeting
98 it is anticipated that the Work Group will need to schedule a meeting to update the NTEP Evaluation Checklist to
99 include any items adopted during the Annual Meeting. As the Work Group Meeting is not yet scheduled, please contact
100 the Work Groups Chair and/or the NTEP Administrator for additional information:

Sector Chair

Mr. Andrei Moldoveanu

NEMA

And_Moldoveanu@nema.org

NTEP Administrator

Mr. Darrell Flocken

Ph: 614-620-6134

darrell.flocken@ncwm.com

101

102 **CAP – CONFORMITY ASSESSMENT PROGRAM**

103 **CAP-1 I Conformity Assessment Program**

104 The Conformity Assessment Program was established to ensure devices produced after the device has been type
105 evaluated and certified by NTEP continue to meet the same requirements. This program has three major elements: 1)
106 Certificate Review (administrative); 2) Initial Verification (inspection and performance testing); and 3) Verified
107 Conformity Assessment (influence factors). This item is included on the Committee's agenda to provide an update
108 on these elements.

109 **Certificate Review:**

110 Certificates are constantly under review by NTEP staff and laboratories. Many active certificates are amended
111 annually because of manufacturer submission for evaluation or issues reported by the states pertaining to information
112 on the certificate. When the devices are re-evaluated and certificates are amended, all information is reviewed, and
113 necessary steps are taken to assure compliance and that accurate, thorough information is reported on the certificate.

114 To keep certificate information up to date, the Committee continues to offer an opportunity for active certificate
115 holders to update contact information that is contained in the "Submitted By" box on certificates. This is offered
116 during the payment period of their annual maintenance fee. Many CC holders have taken advantage of the opportunity
117 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 darrell.flocken@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.

Seven weighing device categories subject to influence factors, as defined in *Handbook 44*, were identified and are subject to VCAP audits. Certificate holders for these device types are required to have an on-site audit of the manufacturer's quality system and on-site random and/or review of a production device by an outside auditor to verify compliance with VCAP. The NTEP Committee and NCWM Board agreed not to include weighing/load receiving elements using NTEP load cells in the list of device categories subject to VCAP. However, the Board notified certificate holders that they have no intention of amending the table of devices subject to influence factor testing found in the Weighing Devices Section of *NCWM Publication 14*.

The Committee has received letters, questions, and many other inquiries pertaining to VCAP. The Committee has worked diligently to answer the questions submitted in a very timely manner. The Committee knows that additional questions will be posed as VCAP progresses. Certificate holders and other interested parties are encouraged to submit written questions to the NTEP Committee. The Committee is pleased to report that it has been successful in answering all the questions to date. Clerical changes and additions have been made to affected VCAP documents as deemed necessary.

Load cells traceable to NTEP certificates were selected for the initial assessment effort. NCWM elected to require a systems audit checklist that is to be completed by an outside auditor and submitted to NCWM per Section 21.3.3.3.5 of the VCAP requirements. A VCAP Systems Audit Checklist for Manufacturers and a VCAP Systems Audit Checklist for Private Label Certificate Holders have been developed and are available on the website at www.ncwm.com/vcap. Additionally, the Committee developed a new *NCWM Publication 14*, administrative policy to distinguish between the requirements for parent NTEP certificate holders (21.3.2) and private label certificate holders. The requirements in 21.3.3.7 track the private label checklist requirements: traceability of the private label NTEP CC to its parent NTEP CC, traceability of the parent NTEP CC to a VCAP audit, purchase and sales records, plan to report non-conforming product and non-conforming product in stock, plan to conduct internal audits to verify non-compliance action, and internal audit records.

VCAP Audits:

The Committee had discussions about the required number of audits for facilities that manufacture multiple device types. For example, if a company had successful audits for two device types, they might submit a request for a delay from audit requirements for remaining device types, stating that they are all subjected to the same processes and will be audited in the next cycle. The Committee agreed to the request in principal and directed the NTEP Administrator proposed a change to the VCAP Policy language. This change was adopted by the NCWM Board in 2013.

ADM – NCWM PUBLICATION 14, ADMINISTRATIVE POLICY

ADM-21.1 I Add Multiple Dimensioning Measuring Devices (MDMD) and Grain Analyzers to VCAP Device List

Source:

NTEP Administrator

Purpose:

Add MDMD and Grain Analyzers to the current list of device types that require VCAP compliance.

Item Under Consideration:

Modification of Publication 14, Administrative Policy, paragraphs 21.3.1. and paragraph 21.3.6. as shown below.

21.3.1. 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 Dimensioning Measuring Devices (T.5.)

Grain Test Scales (T.N.8.)

21.3.6. 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 Dimensioning Measuring Devices (T.5.)

Grain Test Scales (T.N.8.)

The addition of MDMD and Grain Analyzers to the current list of devices is consistent with the scope of the VCAP Policy, that being, all devices that require influence factor testing during the NTEP evaluation and certification process are subject to VCAP Policy requirements.

NCWM 2021 Interim Meeting: The Committee heard no comments regarding this item.

NCWM 2021 Annual Meeting: The Committee heard no comments regarding this item.

NCWM 2022 Interim Meeting: The Committee heard no comments regarding this item.

NCWM 2022 Annual Meeting: The Committee heard no comments regarding this item.

NCWM 2023 Interim Meeting: The Committee received letters and heard comments from manufacturers and from an association representative all in opposition to the addition of Grain Analyzers to the list of devices requiring manufacturers to meet VCAP requirements. All of the opposition was based on three areas. The first area was related to the quality of the product realized from the manufacturers third party certified quality management system, the use of quality components specified in the design phase and carried through into the production phase. The second area was focused on the NTEP Phase II requirements for these devices, and the third area was identified as the

requirement imposing a cost burden that will be passed on to the buyers of these devices with no apparent justification. An additional concern that was voiced was why are we just hearing about this now!

VCAP does touch on the manufacturers quality management system, however, the primary focus is on the device performance to the two specifications from Handbook 44 that cannot be verified during initial and subsequent verification inspections, that is the devices ability to continue to meet performance/accuracy requirements when subjected to external influences such as changes in the AC voltage levels (as specified in Handbook 44, Code 5.56.(a) Grain Moisture Meters, S.2.2.1. Power Supply, Voltage and Frequency) or changes in the temperature of the location of the device (as specified in Handbook 44, Code 5.56.(a) Grain Moisture Meters, S.1.5. Operating Temperature). Compliance to these specifications is only evaluated during the Phase I portion of the evaluation related to the weighing function and can only be verified via the ongoing sample device testing requirements in the VCAP policy. Phase II focuses on the moisture calibration program While the use of quality components is important to the overall continued compliance of the device, the VCAP audit focuses on the control of design changes and component purchasing. VCAP does not get involved in the manufacturing process.

This item has been on the NTEP Committee Report since the 2021 NCWM Interim Meeting (Item number ADM-21.1) and a summary of the item was published in the NTEP Column of the second NCWM Newsletter in 2022. Since its first appearance on the Committee agenda, the Committee received no comments or letters in support or opposition to the item. In an effort to bring awareness to the proposal, a comment was made during the 2022 NTEP Grain Analyzer Sector Meeting. This awareness effort resulted in the NTEP Administrator receiving several emails from manufacturers requesting additional and detailed information about the program. To provide this information, the NTEP Administrator hosted a one-hour Zoom Meeting where a description of the program details, its purpose, the value to NTEP, the manufacturer and the buyer/user of these devices. The video is available for viewing on the YouTube NCWM Channel at www.youtube.com/watch?v=HYNoX7uYmF4.

NCWM 2023 Annual Meeting: The Committee heard no comments on this item.

This item was discussed during the 2023 Grain Analyzer Sector Meeting and several comments were heard by the NTEP Administrator that the majority of the Grain Moisture Analyzers devices did not contain a weighing instrument and their performance was limited to measuring the moisture content of the grain. For the Grain Moisture Analyzers that did contain a weighing function, the function was used to assist in the measurement of the moisture content. It was pointed out that these devices did not undergo influence factor testing associated with the weighing performance. After the Sector meeting, the NTEP Administrator researched this information and confirmed that Grain Moisture Analyzers did not undergo influence factor testing associated with the weighing performance, however, what was found is a device referred to as a "Grain Test Scale" which does have a weighing function and is required to undergo influence testing during NTEP evaluation. Based on this information, the wording of this proposal was modified, by the NTEP Administrator, by replacing the device type "Grain Analyzers" with the device type "Grain Test Scales" in the device list in paragraphs 21.3.1. and 21.3.6.

ADM-23.1 I Acceptance of OIML-CS Test Reports Issued for Devices Evaluated to the OIML R117 Recommendation for Issuing NTEP Certificates of Conformance.

Source:

Meter Manufacturers Association

Purpose:

Recommend that NCWM enter into the OIML-CS for OIML R117 as a Utilizer, thus allowing NCWM to accept test reports for the purpose of issuing NTEP Certificates of Conformance for liquid measuring devices. NTEP will specify in its Declaration any additional national requirement in the U.S. for liquid measuring devices. All NTEP fees still apply and additional evaluation may be required at the discretion of the NTEP administrator.

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 IIIL. 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.

ADM-24.1 I Add Additional Fee Structure for Certificate of Conformance Drafting Time

Source:

NTEP Administrator

Purpose:

There is currently a certificate drafting fee when NCWM personnel draft a Certificate of Conformance that does not require a laboratory or field evaluation. This item is to extend the drafting fee charge to include time spent on drafting Certificates of Conformance that did not require an evaluation.

Item Under Consideration:

Amend Pub 14 Administrative Policy as follows.

17. NTEP Fee Structure

.....

17.3. Certificate Drafting Fee

1. Payable to NCWM if NCWM staff draft the Certificate of Conformance for the purpose of issuing a:-

1.1. private label certificate,

1.2. certificate based on test data issued under the Measurement Canada MRA,

1.3. certificate based on test data under the OIML-CS which the NCWM is a Utilizing participant,

1.4. certificate other than one associated with an NTEP evaluation performed in a laboratory or field evaluation site.

In these ~~this~~ cases, prevailing NTEP evaluation ~~NCWM Member~~ rates apply.

ADM-24.2 I Implement Software Version Change Policy

Source:

NTEP Administrator

Purpose:

To develop a new Policy Statement and Application for informing NTEP of an update to metrological features and/or functions in the software of an NTEP certified device or software-only application where the change modified the Software Version Identification.

Justification:

Prior to January 2022 Handbook 44, General Code, paragraph G-S.1.(d) required that all not-built-for-purpose, software based devices manufactured beginning on January 2004 must identify the software version or revision

number. NTEP has been including the software version identifier on CCs issued to not-built-for-purpose, software based devices after this date.

On January 2022 this paragraph was amended to require all software-based devices to have a software revision or version identifier. NTEP has been including the software version identifier on CCs issued to all software-based devices after this date.

It did not take very long to realize that manufacturers are not submitting an application when the software version changes and soon the version identifier list of the certificate was in question. One solution was to use the term “or higher” which was adopted in 2004. However, this has only led to confusion and concern in the field. Devices were found with a different version format than what was listed on the Certificate of Conformance. During some research, NTEP learned that the “higher” version identifier actually represented metrological changes being made to the device without notifying NTEP of the change.

The following proposal is an attempt to change the current practice and bring control to the software version identification issue.

In support of this new policy, a new “Software Version Identifier Update” application has been created. There will be a fee associated with this application with the amount to be set by the NCWM Board of Directors.

Item Under Consideration:

In Publication 14, NTEP Administrative Policy – insert the following new policy statement as section 15 and renumber all remaining sections.

15. Maintaining the Latest Software Version Identifier on the NTEP Certificate of Conformance

All NTEP Certificates of Conformance issued to all software-based devices after January 1, 2022 have the software version identifier listed. It is imperative that you inform NTEP of any change to the version identifier that indicates a change to the software related to the metrological features and/or functions of the device. Devices found in the field, in a commercial or legal-of-trade application, with a 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.

Mr. Mahesh Albuquerque, Colorado | Committee Chair

Mr. Gene Robertson, Mississippi | Member

Mr. Marc Paquette, Vermont | Member

Mr. Kevin Schnepf, California | Member

Mr. Daniel Walker, Ohio | Member

Mr. Darrell Flocken, NCWM | NTEP Administrator

National Type Evaluation Program Committee

Appendix A

NTEP Statistics Report

(As of September 30, 2023)

General NTEP Statistics	Last Year	This Year
	10/01/20 – 9/30/21	10/01/22– 09-30/23
Total Applications Processed	(43) 322	(64) 302
Applications Completed	324	301
Certificates Issued	305	297
Active NTEP Certificates		2370
() = Reactivations		

Assignments to Labs per Year	10/01/20 – 9/30/21	10/01/22– 6/19/23
California	4	0
Canada	0	(1) 1
FGIS-IL	0	0
FGIS-KC	10	9
Kansas	1	1
Maryland	(1) 8	0
New York	(4) 16	2
NIST Force Group	2	1
North Carolina	5	(1) 2
Ohio	(3) 62	(4) 65
Oregon	2	0
NTEP Staff	(14) 190	(24) 251
Applications Not Yet Assigned to a Lab	0	0
() = Reassignments from another lab		

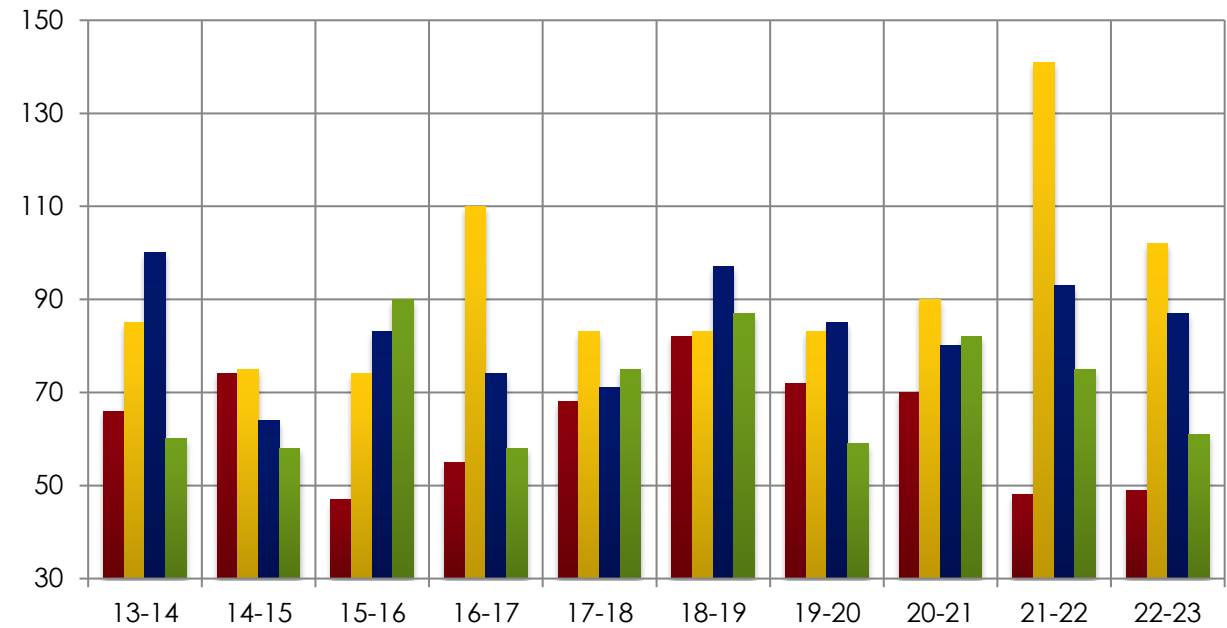
Process Statistics	Last 5 Years
Average Time to Assign an Evaluation	5.2 Days
Average Time to Complete an Evaluation	69.4 Days

Report on Evaluations in Progress

Evaluations in Progress	0-3 Months	3-6 Months	6-9 Months	9-12 Months	Over 1 Year	Total
December 31, 2018	42	17	18	11	8	96
March 15, 2019	36	16	11	13	15	91
June 30, 2019	55	16	6	5	16	98
September 30, 2019	40	23	11	4	11	89
December 31, 2019	35	23	17	6	10	91
February 29, 2020	43	19	16	8	11	97
June 30, 2020	61	28	14	7	11	121
September 30, 2020	36	28	18	8	18	109
March 31, 2021	28	12	9	14	21	84
June 30, 2021	48	9	6	5	16	84
August 20, 2021	56	18	5	7	13	99
December 31, 2021	22	22	23	4	14	85
March 31, 2022	77	8	16	17	14	132
May 31, 2022	69	35	10	12	17	143
September 30, 2022	48	36	16	10	17	127
March 10, 2023	71	21	10	19	25	146
June 19, 2023	92	16	6	7	16	101
September 30, 2022	42	25	11	3	11	92

In Progress by Lab	0-3 Months	3-6 Months	6-9 Months	9-12 Months	Over 1 Year	Total
California						
Canada						
FGIS-IL						
FGIS-KC	1	7	1			9
Kansas	1				2	3
Maryland						
New York						
NIST Force Group		1				1
North Carolina						
Ohio	12	7	5	1	1	26
Oregon						
NTEP Staff	28	10	5	2	8	53
Unassigned						0
Total Pending:						92

10-Year Report on Applications Received by Quarter



	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	21-22	22-23
Oct – Dec	66	74	47	55	68	82	72	70	48	49
Jan – Mar	85	75	74	110	83	83	84	90	141	102
Apr – Jun	100	64	83	74	71	98	85	80	92	87
Jul – Sep	60	58	90	58	73	87	59	82	75	64
Total	311	271	294	297	295	350	300	322	356	302

Average Per Quarter: 10-YR: 77.5
Average Per Quarter This FY: 75.5
Average per Year: 309.8

